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New Paradigm

Edited by Daniela Turcanu-Carutiu

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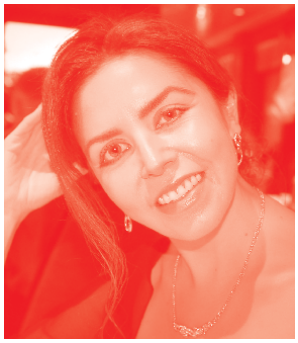

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Meet the editor

Prof. Daniela Turcanu-Carutiu, Ph.D. was the Director of the Institute of Science, Culture, and Spirituality, Ovidius University of Constanta, Romania, including the Center of Expertise Art Works by Advanced Instrumental Methods. Her research interest was in the heritage field: in Physico-chemical investigation by advanced instrumental methods for authentication, conservation, restoration artworks, archaeology components of cultural heritage, materials: pigments-colors and chromatology. She is the author of a reference book on cultural heritage, co-author of numerous chapters and articles published in internationally prestigious journals, and citations in ISI Thomson Web of Science. Her research projects included: an integrated approach for reinforcement of historical chalk monuments by means of nanomaterials-based treatments, new diagnosis and treatment technologies for the preservation and revitalization of archaeological components of the national cultural heritage.

Contents

Preface

This Edited Volume is a collection of reviewed and relevant research chapters, concerning the developments within the "Heritage - New Paradigm" field of study. The book includes scholarly contributions by various authors and is edited by a group of experts pertinent to social sciences and humanities. Each contribution comes as a separate chapter complete in itself but directly related to the book's topics and objectives.

The book is divided into four sections: "The Time of Change", "Culture for the New Generation", "Sustainable Development", and "Conservation through Entrepreneurship".

The first section (The Time of Change) includes chapters dealing with the topics: Cultural Heritage and the Crisis of Democracy, Tackling Eurocentric Perspectives on Cultural World Heritage: Suggestions for Including Postcolonial Approaches in World Heritage Education, Heritage Language Use, Maintenance and Transmission by Second-Generation Immigrants in Cyprus, Alteration of the Cultural, Religious and Architectural Heritage from Lăpuș Land, in the Context of Climate Change, The Impact Study of the Exchanges between the Microorganism Communities on the Surfaces from Constanta Roman Mosaic and Anthropic Interactions, Post-Covid Ideology and Dimensions in Language Teaching, The Mari Lwyd Has Entered the Chat: Intangible Heritage in the Age of Covid-19.

The second section (Culture for the New Generation) includes chapters dealing with the topics: Digital Technology to Preserve Heritage Structures, Use of Drones for Digitization and Monitoring the Built Cultural Heritage: Indoor and Outdoor, Predictive 3D Modelling and Virtual Reality of the World Cultural Heritage of Ruins of the Buddhist Vihara at Paharpur, Bangladesh, Cyber - A Digital Cultural Heritage in a Museum and University Setting, Reflectance Measurements on Cultural Heritage, (In)tangible Heritages: A Critical Review for an Alternative Heritage Discourse (ALHD) Perspective in Sub-Saharan Africa, Novel Ways of Discovering, Capturing and Experiencing Cultural Heritage: A Review of Current State-of-the-Art, Challenges and Future Directions, SYNTHESIS: A Platform of Platforms for Integrated Management, Curation, and Visualization of Digital Cultural Experiences through VR and AR Technologies.

The third section (Sustainable Development) includes chapters dealing with the topics Bore Pile Foundation Construction without Caused Fine Cracks at Three Heritage Building, Structural Consolidation of Architectural Heritage, From Preservation to Reuse – Seeing Possible Futures, The Implementation of Sustainable Development and Protection of Cultural Heritage at Different Levels of Spatial and Urban Planning: A Case Study of the Republic of Serbia, Can Solidarity Paradigm Be a Catalyst for the Sustainability of Tourism?

Synergy between the Church and Government in Community Development: A Sociocultural Entrepreneurship Approach, Cultural Heritage Tradition and Innovation in the Internationalization of Family Business: A Case Study from the Italian Fashion Industry, The Movable Heritage of Drăghia, Traditional Games: Socialization and Culture in Kabylie, are included in the last section of this book (Conservation through Entrepreneurship).

The target audience comprises scholars and specialists in the field.

IntechOpen Team

Note from the Publisher

It is with great sadness and regret that we inform the future readers of this book that the Editor, Prof. Daniela Turcanu-Carutiu, passed away shortly before finishing the book and having a chance to see its publication.

Prof. Daniela Turcanu-Carutiu was IntechOpen's dear collaborator and she authored or co-authored 9 book chapters with us and edited 3 books.

This collaboration continued until her final days when she was acting as the editor of the Book "Heritage - New Paradigm".

We would like to acknowledge Prof. Daniela Turcanu-Carutiu contribution to open access scientific publishing, which she made during the years of dedicated work, and express our gratitude for her pleasant cooperation with us.

IntechOpen Book Department Team, July 2022

Section 1

The Time of Change

Chapter 1

Cultural Heritage and the Crisis of Democracy

Yussef Campos

Abstract

Democracy in Brazil is experiencing a crisis that has not been seen for a long time. After the 1988 Constitution, democratic institutions began to show signs of strengthening, such as the Public Ministry, the Judiciary, direct elections, among others. However, the rise of the extreme right – a non-exclusive event in our country – has mitigated and persecuted these institutions, with their dismantling, their ideological and religious equipment and even their extinction, as happened with the Ministry of Culture. The National Historical and Artistic Heritage Institute has also been the target of repeated attacks. Appointments of unprepared individuals, without adequate qualification to assume management and leadership positions at the Institute has been the Achilles heel of the almost centenary IPHAN (National Historical and Artistic Heritage Institute, in the acronym in Portuguese). Other facts mark the attack on places of memory and Brazilian heritage. In the midst of demonstrations around the world about the modification of place names that honor human rights defenders and the overthrowing of their statues, in Brazil the president of the republic testifies to his inability to occupy this position by giving prizes to torturers who acted as torturers in the Civil-Military Dictatorship (1964–1985). Thus, this brief text will seek to exemplify how some facts – some prior to the current administration but which solidify with it – exemplify the current democratic crisis, which strikes not only Heritage and places of memory, but also an entire state structure that comes undone through the virulence of fake news and corruption led by the Bolsonaro family.

Keywords: cultural heritage, Covid-19, crisis of democracy, Brazil

1. Introduction

Democracy in Brazil is experiencing a crisis that has not been seen for a long time. After the 1988 Constitution, democratic institutions began to show signs of strengthening, such as the Public Ministry, the Judiciary, direct elections, among others.

However, the rise of the extreme right – a non-exclusive event in our country – has mitigated and persecuted these institutions, with their dismantling, their ideological and religious equipment and even their extinction, as happened with the Ministry of Culture.

The National Historical and Artistic Heritage Institute has also been the target of repeated attacks. Appointments of unprepared individuals, without adequate

qualification to assume management and leadership positions at the Institute has been the Achilles heel of the almost centenary IPHAN (in the acronym in Portuguese).

Other facts mark the attack on places of memory and Brazilian heritage. In the midst of demonstrations around the world about the modification of toponyms that honor human rights defenders and the overthrowing of statues of them, in Brazil the president of the republic testifies to his inability to occupy this position by giving prizes to torturers who acted as torturers in the Civil-Military Dictatorship (1964–1985).

Thus, this brief text will seek to exemplify how some facts – some prior to the current administration but which solidify with it – exemplify the current democratic crisis, which strikes not only Heritage and places of memory, but also an entire state structure that comes undone through the virulence of fake news and corruption led by the Bolsonaro family.

2. Unwanted toponyms for democracy

In the midst of pandemics – of the Coronavirus, of authoritarianism, of indigenous genocides – I come across encouraging news. After the collapse of the statue of slave trader Edward Colston, in Bristol, hurled into the river, anti-racist activists continued their protest movement and replaced the nefarious slave sculpture with the statue of Jen Reid, a demonstrator who was photographed on the pedestal after the outrageous landmark. This demonstrates that the iconoclasm of withdrawal alone is not enough. There is a need for substitution, training, education, political projects and public policies that enable reflection, questioning, debate and demands. These public priests to enslavers, murderers, dictators, catechists, in short, to all sorts of exercise of force and agency over the other, not only can but also must be revised.

How do we live with so many place names that bow to icons of violence and bestiality, of obscurantism? How do we accept the existence of numerous Getúlio Vargas avenues throughout the country? President Costa e Silva Bridge (yes, this is the real name of the Rio-Niteroi bridge)? Schools Marshal Costa e Silva?

Because in our country, the education crisis is not a crisis, it is a project, as the liberator Ribeiro [1] has already taught. That yes worthy of statues, busts, memorials, and different tributes, among them the most important: being heard.

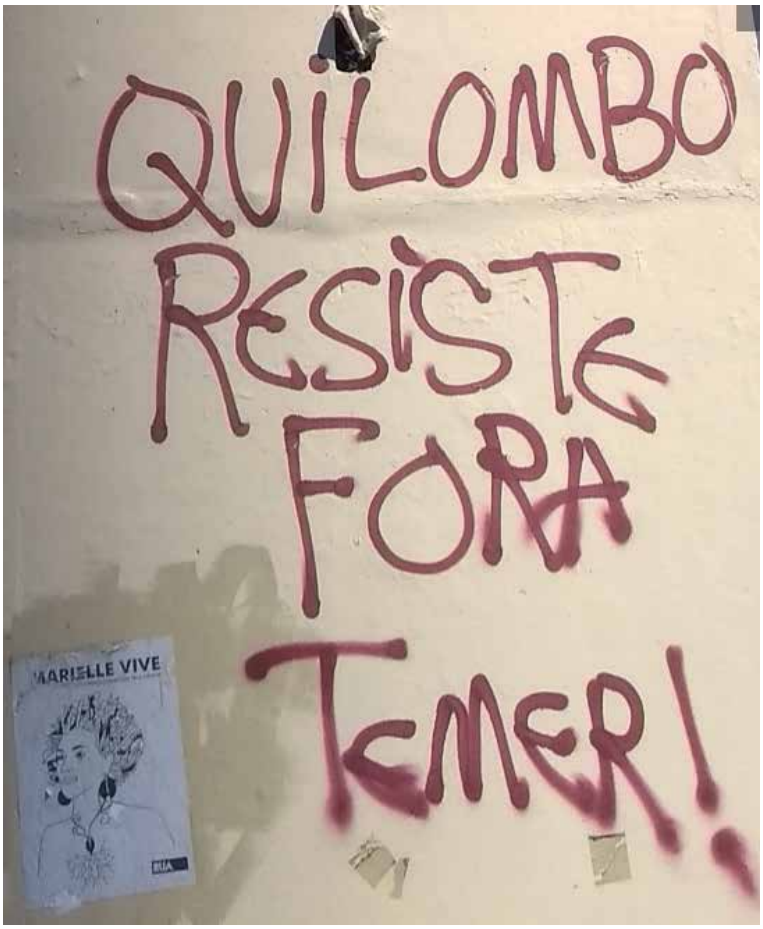
Statues and busts of Christopher Columbus, Jefferson Davis (President of the Confederate States during the Civil War), Belgian King Leopoldo II, Winston Churchill, Father Antonio Vieira, among others, have already felt the weight of the indignation of those who cannot stand taxes for those who imposed dominion, religion, indifference and brutality. Duque de Caxias, Manuel de Borba Gato, Fernão Dias, Bartolomeu Bueno da Silva – Anhanguera, to put their beards on, because the Brazilians are not unaware of this movement. They did not fall off their pedestals nor have their names taken entirely from city toponyms. Yet!

A few exceptions begin to feed us democratic hope. In Maranhão, Governor Flávio Dino signed a decree in 2015 that determined the change of names of schools that held titles of personalities presented in the report of the Truth Commission, accused of crimes of torture during the civil-military dictatorship. For example, the Castelo Branco Teaching Center was renamed C.E. Vinícius de Moraes; o C. E. Emílio Garrastazu Médici, C. E. Paulo Freire.

In Goiânia, the pedestal that supports the brutal Anhanguera is constantly the target of demonstrations (see images): "quilombo resiste" ("quilombo resists"); "Fora Temer" ("go out Temer"); "Marielle vive" ("Marielle lives"). They are not banal vandalism as the most conservative people want to call it. The monuments and the built cultural heritage as a whole, are targets of demands for their resonance and their exposure. This also became one of the functions of the monument. The oppressed must not host the oppressor itself, instructed Freire [2]. Statue for him! Let us not leave our ego depersonalized, shouted Fanon [3]. Bust it already!

If these claims are not identified as calls for a duty of justice and a duty of memory, as preponderated by Ricœur [4], soon we will have busts at Brilhante Ulstra, Major Curió and Sérgio Paranhos Fleury at the Esplanade of Ministries. May we do our duty, so that the pigeons do not have to, once again, do theirs.

Monument to Bandeirante, Goiânia (Author photo, June 14, 2019).



Detail of the photo.

3. When heritage is just rhetoric

The eloquence with which a cultural or natural asset is patrimonialized, sometimes points only to its political-partisan use, with the omission of its ideal objective: the protection of the patrimony and/or the emancipation of the groups that hold the good. Let us observe.

They are registered as a World Heritage Site, by UNESCO (of the acronym in English, United Nations Educational, Scientific and Cultural Organization), the Complex of Protected Areas of the Pantanal (Mato Grosso and Mato Grosso do Sul); the Cerrado Reserves – Veadeiros Plateau and Emus National Parks (Goiás); and the Central Amazon Conservation Complex (Amazonas).

Regarding the first, the National Historical and Artistic Heritage Institute (IPHAN), points out that "inscribed by Unesco in the List of World Natural Heritage and Biosphere Reserve in 2000, the Pantanal Complex of Protected Areas, which comprises the Pantanal National Park (Mato Grosso), the Private Natural Protection Reserves of Acurizal, Penha and Dorochet, is the largest continuous flooded freshwater system in the world and one of the richest ecosystems in wildlife. Typically regional, constitutes one of the most exuberant and diversified nature reserves on the planet".

As for the second, "the Chapada dos Veadeiros and Emus national parks were declared World Natural Heritage by Unesco in 2001. Both regions are protected areas of the Brazilian Cerrado Reserves, one of the oldest and most diverse tropical ecosystems in the world. For millennia, these places have served as a refuge for several species during periods of climate change and will be vital for maintaining the biodiversity of the Cerrado Reserves region during future climatic fluctuations".

Finally, the Amazon is an area inscribed on the World Heritage List by Unesco, which "has more than six million hectares and is one of the richest regions on the planet in terms of biodiversity, with important examples of lowland ecosystems, igapó forests, lakes and channels – which form an aquatic mosaic in constant change, where the largest variety of electric fish in the world lives. The Central Amazon Conservation Complex is formed by the Jaú National Park (registered in 2000), the Mamirauá and Amanã Sustainable Development Reserves, and the Anavilhanas National Park (registered in 2003), all in the State of Amazonas".

However, I wonder: why are they being destroyed? Who could protect them? What is the use of recognition as not only Brazilian heritage, but also of Humanity?

One answer to one of the questions would be the federal government. However, this is one of the accomplices, authors and artisans of the criminal destruction of our rich biomes. The statement by the Minister of the Environment that said, in a ministerial meeting, that the federal government should take advantage of the media focus on COVID-19 to "pass the cattle" became notorious. This means relaxation of environmental laws, deregulation, or, in direct Portuguese, making them loose and inefficient.

The minister had already been acting in this direction. Normative Instruction 13/2020, published even before the sacrilegious meeting of April 22, allows the spraying of agricultural fungicides and mineral oil in the banana crop, with a reduction in the distance between the population areas and those to be sprayed by pesticides. Thus, rural, quilombola, indigenous communities become more susceptible to being affected. Another example is the attempt to regulate illegally occupied lands, through Provisional Measure 910, the "MP da Grilagem" (land grabbing).

Land grabbing, land invasion, agribusiness are direct causes of persecution of family farming, expulsion and genocide by indigenous people, violence against quilombolas and, clearly, the destruction of the biomes mentioned above.

According to INPE (National Institute for Space Research, in the acronym in Portuguese), the Pantanal faces the largest series of fires in the last 20 years. To date, 15% of the entire length of the biome in Brazil has been destroyed. Species threatened with extinction, such as jaguars, pigeons, macaws, among others, suffer even more from these environmental crimes.

The same is true of the Brazilian Amazon Forest and Cerrado. According to Greenpeace, of the hotspots registered in July of that year, "539 were within Indigenous Lands, an increase of 76.72% over last year, when 305 hotspots were mapped. In addition, 1,018 reached Conservation Units, an increase of 49.92% over the same period last year". For Brasil Escola, "extensive livestock and mechanized agriculture of soy, corn and cotton are the main causes of the destruction of much of this type of plant formation". It should be remembered that the Cerrado is responsible for supplying several water networks throughout Brazil, and the Amazon is a source of moisture to feed rain in other parts of the country.

So, I think that patrimonialization actions are not simple panaceas. They must be means of promoting these biomes, instrumentalizing public protection policies, and applying effective and effective penalties. Unfortunately, today in Brazil, this is not what we see. There are only crickets and grasshoppers. Hope is no longer seen.

4. Women of the National Historical and Artistic Heritage Institute (IPHAN)

According to the Michaelis dictionary, the meaning of patrimony is "1 Paternal inheritance; 2 Family property". *Pater*, father. Yes. Patriarchy is present in our language. If it is the individuals who speak, express themselves, and write; and if the *pater* is historically structural, he is also part of the cultural heritage, since it is the social groups that attribute values to what becomes heritage. Would there be a cultural marriage? No, at least institutionally and legally.

Many men were responsible, meritoriously, for leaving us what we now call cultural heritage and the Heritage Institute. Modernists, state bureaucrats, academy thinkers. There they were, directly or indirectly, inventing our historical and artistic heritage, in the 1930s: Rodrigo Melo Franco de Andrade, Mário de Andrade, Lúcio Costa, Afonso Arinos de Melo Franco, Gilberto Freyre, Carlos Drummond de Andrade, Gustavo Capanema (Vargas), Luís Saia, Paulo Tedim, J. Sousa Reis, Alcides Miranda, Edgar Jacinto, Sérgio Buarque de Hollanda, Alceu Amoroso Lima, Manuel Bandeira, among many others.

There were also women. Although silenced by the massive part of historiography that focuses on the theme, they had and still have an indispensable role in the constant construction of collective memory in our country. Very briefly, I will report a little on some of them. Starting with Judith Martins. She "started working at the National Historical and Artistic Heritage Service in April 1936, becoming one of the secretaries of Rodrigo Melo Franco de Andrade, the institution's first director. Encouraged by Rodrigo, Judith began researching the bibliography on Aleijadinho, a study that resulted in the article 'Notes for the bibliography referring to Antônio Francisco Lisboa, the Aleijadinho', published in the 3rd issue of the Journal of National Historical and Artistic Heritage Service, in 1939, and republished, in 1950, in the 6th issue of the Journal of Center for Folkloric Studies, Faculty of Urbanism, University of São Paulo".

Hélcia Dias, on the other hand, who worked as a typist, librarian and expert in fine arts, published works and technical articles, such as "The Furniture of Inconfidentes", in issue 3 of J National Historical and Artistic Heritage Service, 1939; Heloísa Alberto Torres was director of the National Museum and the only woman on the Supervisory Board for Artistic and Scientific Expeditions in Brazil, from 1934 to 1939, and author of an article published in the first National Historical and Artistic Heritage Service (1937); Lygia Martins Costa, Iphan's first museologist, was the author of reference texts on Aleijadinho, Arts, Heritage, Museology and Regional Museums; Hanna Levy, German and art historian, worked at the Institute in the 1930s and 1940s.

Saint Antonio Mother Church [5]. The architectural and urban complex of Tiradentes was listed by IPHAN in 1938.

However, little or nothing is seen in the toponyms and/or other forms of homage made by the Institution itself regarding female names. Sílvio Romero Competition, Gustavo Capanema Building (Palace), Lúcio Costa Center (located at Getúlio Vargas Avenue), Roberto Burle Marx Site, Rodrigo Melo Franco de Andrade Award, Aloísio Magalhães Library, Noronha Santos Archive, Luiz Castro de Faria Award, Folklore Museum Edison Carneiro, Amadeu Amaral Library, Manuel Diéguez Jr. Award Unquestionable honors to those who dedicated themselves to the set of actions, in decades of work, to IPHAN. All men.

But I stay here, looking at the computer screen in my office, running away from anachronism, incarcerated by the pandemic, looking for prizes, libraries, buildings, competitions Judith Martins, Hélcia Dias, Heloísa Alberto Torres, Lygia Martins Costa, Hanna Levy, Nair Batista, Lia Motta, Márcia Chuva, Cecília Londres Fonseca, Jurema Machado, Cláudia Baeta Leal, Célia Corsino, Salma Saddi ...

5. It is worth it?

On November 5, 2020, the rupture of the ore tailings dam in Mariana, Minas Gerais, is five years old. The companies Samarco, BHP Billiton and Vale are responsible for an environmental crime of no proportions, which spilled 40 million cubic meters of waste for what was in front of them, devastating communities, contaminating rivers, interrupting the lives of adults and children. Districts such as Bento Rodrigues and Paracatu de Baixo have been wiped off the map by mining, which has hit the state of Minas Gerais like a cancer for centuries. About 40 municipalities in Minas Gerais and Espírito Santo were directly affected and more than 600 kilometers from the Doce River and tributaries were infected by the mass of toxic stubble. And many culprits have not yet been duly held accountable.

According to the Transaction and Conduct Adjustment Term, signed by the companies and the Union, IBAMA, the Chico Mendes Institute, the National Water Agency, National Indian Foundation, the States of Minas Gerais and Espírito Santo, among other organizations and institutions, are among the areas impacted by crime: habitats and fauna along the Gualaxo, Carmo and Doce rivers; lagoons and springs adjacent to the riverbed; estuaries and mangroves at the mouth of the Doce river; fish breeding areas; etc. In addition, there was a socio-environmental impact on the way of life of riverside populations, estuarine populations, indigenous peoples and other traditional populations.

For Ailton Krenak, whose ethnicity lives on the banks of the Doce River, a relative – the river – is seriously ill. "I belong to a family that lives on the left bank of that river. My family, Krenak, lives on the left bank of that river that on the map is the Doce, but that in our subjectivity he is our grandfather. And his name is 'Watu'. We sing for 'Watu', we put our children inside him to vaccinate them. We talk to him, we dream about him. And we win his dreams." For Ailton, "at some point, for the mining companies, it was good to say that the river died. 'I'm sorry, the river died', they cry and such. When we started to say: 'Oh Watu Mirare re', 'Watu 'he is alive,' Watu 'is in a coma and we will be watching over' Watu 'until he returns". Thus, he gave a lecture he gave in October 2019 at the Federal University of Goiás.

But this crime has a precedent that has been overlooked in the past five years by the mainstream media: the privatization of Vale. Sold at a bargain price by the FHC government, the company was bought in May 1997 by the Vicunha group, which, during the Itamar Franco government, had acquired Companhia Siderúrgica Nacional. It should be noted in passing that Vale was privatized with subsidized financing, made available to buyers by the National Bank for Economic and Social Development.

The justification most exposed by managers for the privatization of companies is the low quality in the provision of services. In this way, they hide their vested interests and the illicit enrichment of some to the detriment of the real owner of these companies: the Brazilian population. Another argument is that state-owned companies are not profitable. But where is it written that a public company has profit as its primary objective? This is the purpose of private capital. Public companies aim to provide a necessary and efficient service to society. The inefficiency that is usually attributed indiscriminately to public services is, in general, a result of the lack of investment in them, often with the scope and within a project aimed at dismantling them and making them attractive to the private sector.

Privatization does not even guarantee the improvement of services. Many countries, primarily in Europe, have re-nationalized companies to achieve an improvement in their performance. In the last ten years, Germany and France undid 500 concessions and privatizations of the kind. According to geographer Lavinia Steinfort, TNI (Transnational Institute) project coordinator, re-nationalization is growing because private companies have inadequate and inefficient services. For her, "the profit prioritization of private companies is, in most cases, in conflict with the execution of services on which society depends".

In the case of Vale, the search for profit is the agent of the decrease in investments in security, one of the causes not only of the crime that occurred in Mariana, but also in Brumadinho and the others that are to come. If the privatized Vale is an ugly son, it has a father: Fernando Henrique Cardoso.

Paracatu de Baixo, Mariana, Minas Gerais (Author's collection, 2019).

6. Clio's new challenges

In Greek mythology, Zeus joins Mnemosyne to celebrate his victory against Cronus. From this union, nine Muses are born, among them Clio. Titan Mnemosyne is, from Greek theogony, the feature of memory; Zeus, of authority, of power; while Cronus, of time. Can we say, even without a careful reading, that memory combined with power is capable of defeating time? Perhaps it is rushed to assert. But it is important to say that Clio, or the allegorical feature of history, emerges from this union.

I use this brief digression to refer to the Brazilian Law 14038, of August 17, 2020, for innovating the legal system. This law met a demand for years, to regulate the profession of and the historian.

There is an apparent irony in this legal instrument: it was signed by the current President of the Republic, who, in his awkward statements, claims that these professionals who practice shamelessness, drug addicts and cultivators of substances prohibited by law, are unnecessary for Brazilian science (practice, the abrupt and radical cut in the transfer of resources to the colleges and institutes of History of Brazil, present in Federal Universities), among other absurdities. However, it should be noted that the President totally vetoed the bill, and the veto was overturned by the National Congress.

The law lists as historians and historians (article 3) those who hold a diploma in higher education in history, issued by a regular educational institution; holders of a higher education diploma in history, issued by a foreign institution and revalidated in Brazil, in accordance with the law; holders of a master's or doctoral degree in history, issued by a regular educational institution or by a foreign institution and revalidated in Brazil, in accordance with the law; holders of a master's or doctoral degree obtained in a postgraduate program recognized by the Coordination for the Improvement of Higher Education Personnel – CAPES with a line of research dedicated to History; professionals with degrees in other areas who have proven to have been historians for more than 5 (five) years, as of the enactment of this Law.

In other words, there is a wide spectrum of professionals who can work in the area. I do not think it is a market reserve or epistemological preciousness. It is about enabling professionals to have legal and professional security to exercise the teaching of History in primary and secondary schools; organize information for publications, exhibitions and events on history topics; plan, organize, implement and direct historical research services; advising, organizing, implementing and directing historical information and documentation services; advise actions aimed at the evaluation and selection of documents for preservation purposes; prepare opinions, reports, plans, projects, reports and works on historical themes, as dictated in article 4.

However, I believe that the greatest challenge will be, and has already been, to meet the requirements of Articles 5 to 7, as they deal with professional registration and legal qualification for the exercise of the profession. The Brazilian National Association of History is an institution dedicated to supporting teaching and research in the field of History, since the 1960s, as well as the defense of the free exercise of the activities of History professionals. Establishing itself as a class entity based on legislation that, at first sight, evokes the need for an organization along the lines of the Brazilian Bar Association and the Federal Council of Medicine, mutatis mutandis, is the great obstacle put.

To emerge from the dismissal of a titanic authority, to resist persecution during the civil-military dictatorship, to overcome obscurantism and negationism and to bring the current president to his knees before the overthrow of the veto, we have already done so, and we continue to struggle. Now we have to trim the inside edges and promote our craft to the level of its conspicuous relevance.

7. Conclusion

"God bless America"! This is the phrase that 10 out of 10 Americans cry out countless times a day, at least among conservatives. However, what will save Americans, like the entire world population, will be vaccines and supplies, in addition to oxygen. China and Russia, with their respective Coronavac and

Sputnik V, are giving us a hint of hope that everything will start to change, at least in countries where necropolitics is not the government regime. Even with the anti-diplomatic attacks carried out by the Brazilian government and its appendices, as ministers and the presidential clan, the countries that once called themselves communists and governed from their Politburos (central committees of the Communist Party), are being the breather for way out of this terrible crisis. This stalker ideology of Bolsonaro has caused the country thousands of deaths. As Millôr Fernandes would say, "I am suspicious of any idealist who profits from his ideal."

And not only have these countries given logistical support to Brazil. India and Venezuela have served Brazil with oxygen and inputs, even though the government of our country insists on conspiracy theories and replicates Trumpist silliness here, despite the orange president of the USA having left through the back doors of the White House. Therefore, God bless Bolívar and Raja. Or that Buddha protects us.

One of the president's sons told us: "it happens in the USA, it happens in Brazil". It referred to the terrorist attacks by white supremacists on that country's Congress. However, I hope that the inept Brazilian congressman is right, as American democratic institutions have survived the chaos of the past four years. May your father be prevented here and that democracy has oxygen to resist.

The polymath and polemic Millôr Fernandes, a great critic of Brazilian party politics, once shouted: "Brazil is the United States where I live". The ironic power of this great genius united the equation between the bovarism pointed out by Lima Barreto and denounced by Nelson Rodrigues, so present in the Bolsonaro clan. The president, if Millôr could define it (in fact he did it prophetically), would do it this way: "every ruler is composed of 3% of Lincoln and 97% of Pinochet".

It fits like a glove for the president, although there is, in Millôr himself, a bit of bovarismo. Let us be Latin Americans (the Brazilian lacks that!) And replace Lincoln with Allende. The old conservative waves that plague some parts of the world, and sweep Brazil, with neo-fascist agendas and unfounded alibis that "justify" the necropolitics, have made Brazil a perennial obituary. "When an ideology is very old, it comes to live in Brazil," stated Millôr.

Countless are the legal causes for Bolsonaro's impeachment. Even with the facts described above, the mayor, Rodrigo Maia, insists on saying that there is no political inclination for the impediment. What does the congressman expect? Die his? I use Millôr as a true argument of authority: "a politician is a subject who convinces everyone to do something that he has no conviction about"!

As there is still no political viability for Impeachment? I like those who defend human rights and who practice and promote inclusion and emancipation policies. They are invariably in the field on the left. But there is this other left, which is nothing more than a group of conservatives in Jacobean allegories.

"Idleness is the mother of all vices", taught Millôr! In addition to Temer's decoration, Mourão has also cleaned up presidential dejection. And point. His only contribution is to give euphemisms to the captain's profanity fenestrated by the Armed Forces.

The work of legal professionals, who specialize in Cultural Heritage, is perhaps an answer to this crisis that UNESCO, IPHAN and other preservation and protection agencies are experiencing in Brazil. The action of ICOMOS (the acronym in English, International Council for Monuments and Sites) is at the forefront of this, since it has a specific committee to deal with the relationship between Law and Heritage. But it is necessary to reinforce this committee. You need to make it robust.

Thus, this brief text also serves as a call for interested parties to allow ICOMOS to be an effective vehicle for the preservation of Brazilian heritage.

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Chapter 2

Tackling Eurocentric Perspectives on Cultural World Heritage: Suggestions for Including Postcolonial Approaches in World Heritage Education

Verena Röll and Christiane Meyer

Abstract

The chapter analyses and discusses the perspectives of young people on cultural World Heritage and its imbalanced global distribution. The qualitative study is based upon focus groups and hermeneutic photography conducted with 43 secondary school students aged 14–17 years from Lower Saxony, Germany. The findings of the focus groups, which are presented in this chapter, reveal deeply rooted Eurocentric thinking patterns, that structure the understanding of cultural World Heritage in general and are used to justify the dominance of European cultural World Heritage sites. Due to these results, the authors call for including post- and decolonial approaches in World Heritage Education to foster the adoption of critical and reflexive thinking.

Keywords: World Heritage, cultural heritage, students' perceptions, World Heritage Education, Eurocentrism, postcolonial education

1. Introduction

Since its adoption in 1972, UNESCO's World Heritage (WH) Programme has become the most influential framework for the protection and preservation of cultural and natural heritage around the globe. The WH list is made up of diverse sites such as Robben Island, South Africa, Machu Picchu, Peru or Zollverein Coal Mine Industrial Complex, Germany and is set up to represent the heritage of all humankind. However, the WH statistics tell a different story. The global distribution of WH is highly imbalanced and currently 47.2% of all 1121 WH sites (status: June 2021, World Heritage properties inscribed between 1978 and 2019) are located in Europe and North America. With cultural WH the imbalance is even more drastic: 52% of all 869 sites are located in Europe and North America [1]. The UNESCO is aware of these disparites and already in 1994 a study identified Eurocentric and elitist approaches towards cultural heritage as the main reasons for the imbalanced global distribution [2]. Critics have argued since then that the UNESCO is at the center of a so called 'authorised heritage discourse' (AHD) [3] which presents "heritage as complete, untouchable and 'in the past', and embodied within tangible

things such as buildings and artefacts." [4]. Due to continuous debates and rising influence from voices from the Global South, cultural heritage has experienced a shift from a narrow to a more complex conceptualization [5, 6]. The Eurocentric roots of WH are one, but not the only cause of the global imbalance. Other reasons include unequal financial capacities of national states, national interests and international relations of states nominating a site [7–9].

While these issues are widely discussed within the UNESCO and the scientific community, they have not reached World Heritage Education (WHE). This educational blind spot (see next section) is accompied by a research gap concering WHE [10]. In Germany, members of the working group World Heritage Education have generated studies on the educational potential of WH in general [11] and the interpretation activities at specific World Heritage sites (WHs) [12, 13]. But although many of the educational activities and learning resources provided by the UNESCO, National Commissions or WHs are targeted at a young audience, the perspectives of young people towards WH have not been explored yet.

The aim of this chapter is thus to present perceptions of 14–17 year old secondary school students from Lower Saxony, Germany towards cultural WH. Due to the identified gaps, the participants' criteria for cutural WH and their presumed reasons for the imbalanced global distribution of cultural WH are focused.

This chapter will first discuss the aims of WHE and its current blind spots. Secondly, it will present selected perspectives of secondary school students on specific aspects of cultural WH. These results reveal Eurocentric thinking patterns, hence, underlining the necessity for decolonising heritage [14]. To conclude, the authors provide suggestions to foster the adoption of critical and reflexive thinking in WHE.

2. World Heritage Education: objectives and blind spots

With the adoption of the World Heritage Convention, State Parties acknowledge "that parts of the cultural or natural heritage are of outstanding interest and therefore need to be preserved as part of the world heritage of mankind as a whole." [15]. For the purpose of safeguarding WH, State Parties commit to instal "educational and information programmes, to strengthen appreciation and respect by their peoples of the cultural and natural heritage" [ibid.].

In its first decades, the discourse on WH was clearly focused on conservation and restoration. With rising tourism numbers, the economic advantages as well as the diverse challenges caused by tourism attracted the attention of UNESCO experts and scholars [11]. But with the launch of the World Heritage Education Programme in 1994, educational aspects started to gain importance.

On a general level, the programme aims to integrate WHE in the school curricula [16]. In the case of Germany, the National Commission for UNESCO supports the integration [17]. In Germany, Federal States are responsible for developing the curricula, but so far none has implemented the suggestion. Nonetheless, there are a wide range of actors in the field of WHE, ranging from WHs, heritage institutions and individual scholars, that provide educational activities on site and/or classroom resources. Examples include the classroom resources offered by the WHs Water Management System of Augsburg and the Upper Middle Rhine Valley or by the preservation foundation Deutsche Stiftung Denkmalschutz. References to WH can also be found in textbooks, for example when discussing deindustrialisation or tourism [18, 19].

When looking at the proclaimed objectives of WHE, different intentions of the UNESCO, National Commissions for UNESCO, scientific scholars and other

actors in the field of heritage education become apparent. The educational aim of UNESCO's World Heritage Education Programme is to promote awareness for the World Heritage Convention and "a better understanding of the interdependence of cultures" [16]. Further, young people should be made aware of the various challenges threatening WH and be encouraged to engange in its protection. In line with these aims, the German, Austrian, Swiss and Luxembourg Commission for UNESCO have jointly stated that WHE fosters the awareness for identity, respect, global solidarity and the positive exchange among different cultures [20].

By solely focusing on the seemingly unifying aspects of WH, the National Commissions apply an instrumental approach that is limited to creating attachment and fostering awareness [21, 22]. At the same time, this approach lacks a critical examination of the criteria, definitions, procedures and of the underlying intentions and values of the involved stakeholders. This is further underlined by the recommendation of the German Commission for UNESCO [23] "that a consistent narrative is employed by all stakeholders" at WHs. This approach can be traced back to Tilden's [24] famous appeal: "Through interpretation, understanding; through understanding, appreciation; through appreciation, protection." This interpretation model has been accused for being "disempowering" [25] as the visitor experience is reduced to passively accepting the given narrative. In order to meet the needs of today's diverse communities, Silberman [26] refers to heritage interpretation as a public discourse, that needs to integrate divergent and conflicting understandings and values.

The fact that WH is the result of a national and international negotiation process, requires reflections on (global) political hierarchies, Eurocentrism and repression of minorities [27]. WH criteria, the nomination process or the involved stakeholders are common topics of learning resources but are usually conveyed as given facts. (e.g. [28–30]) None of the learning resources known to the authors critically discuss the imbalanced global distribution of WH. De Cesari's [31] observation that "World Heritage not only builds upon the tradition of national heritages but in fact reproduces, amplifies and expands this tradition's logic and its infrastructure" can thus be transferred to WHE.

This interim conclusion points to the necessity to specifically address the shown blind spots in order to path the way for critical and reflexive thinking in WHE. But at first, the perspectives of young people on WH need to be explored in order to develop educational resources and methods, that explicitly integrate their attitudes and perceptions and possibly challenge existing stereotypes.

3. Empirical study: methods and sampling

The diverse perspectives of young people on cultural WH were the focus of the research project "Cultural World Heritage from the perspective of young people – perceptions, meanings, attitudes and values in the context of cultural awareness and societal transformation". The three-year project consisted of a qualitative and a quantitative study (see acknowledgements), the former being the subject of this chapter. The qualitative study explored perspectives of secondary school students aged 14–17 years on cultural WH using first focus groups and and in a second step hermeneutic photography (site visit) [32]. It has to be stressed, that the focus was purely on cultural WH, while perceptions on natural WH were not part of the study. For the purpose of this chapter, selected results of the focus groups will be discussed. The data was collected between May 2017 and September 2018. In total, 43 students (12 groups) from Lower Saxony, Germany, participated in the study (**Table 1**). Six groups were from Hanover, a city without a WHs, while two groups

Group	City	Participants			Destination of site-visit
		Total	Female	Male	
(Pretest)	(Hanover)	(4)	(4)	(–)	(Historic Town of Goslar)
G1	Hanover	3	2	1	Historic Town of Goslar
G2	Hanover	4	4	—	St Mary's Cathedral and St Michael's Church at Hildesheim
G3	Hanover	4	4	—	Fagus Factory, Alfeld
G4	Hanover	3	3	—	Historic Town of Goslar
G5	Hanover	4	4	—	Historic Town of Goslar
G6	Hanover	4	2	2	Mines of Rammelsberg
G7	Alfeld	5	2	3	Fagus Factory, Alfeld
G8	Hildesheim	3	2	1	St Mary's Cathedral and St Michael's Church at Hildesheim
G9	Alfeld	3	—	3	Fagus Factory, Alfeld
G10	Goslar	3	—	3	Historic Town of Goslar
G11	Goslar	3	2	1	Historic Town of Goslar
G12	Hildesheim	4	2	2	St Mary's Cathedral and St Michael's Church at Hildesheim
Total		43	27	16	

Table 1.
Overview of the sample.

each came from the WH cities Alfeld, Goslar and Hildesheim. 27 students identified as female, 16 as male. Each group of students participated in two focus groups. The second focus group was conducted one week after the first one. The length of the sessions varied between 18 and 60 minutes, depending on the participants willingness to discuss. The focus groups were recorded by video and audio. Afterwards the material was transcribed and analysed by qualitative text analysis [33]. For the purpose of this chapter, selected quotes of the participants were translated by the authors.

Focus groups are group discussions that are structured by questions and preselected stimuli, such as newspaper articles, video clips, diagrams or photos [34]. In this study, the focus groups were divided into different phases. **Table 2** shows the structure of the focus groups and lists the topic and stimuli of each phase.

The aim of the focus groups was to investigate the perceptions, meanings, attitudes and values towards cultural WH. In the following, we will first present the results of phase 1.a (associations and perceptions regarding cultural WH) and secondly focus on phase 2.c (global distribution of cultural WH/reasons for the global imbalance) and 2.d (personal attitudes towards the global distribution/nomination process).

In phase 1.a the participants first stated their associations with cultural WH and described their previous experience with cultural WH. In the following phase they discussed possible characteristics of cultural WH. This question served to uncover their perceptions regarding the criteria of cultural WH. To avoid biased answers, the official criteria were not shown to the participants. The characteristics were recorded in writing. In the course of the following discussions, the participants could in turn refer to them and make adjustments.

The imbalanced global distribution of cultural WH was one of the main topics of the second focus group. At first, the participants were asked to make assumptions

Phase	Topic	Stimuli
	First Round	
1.a	Associations and perceptions regarding cultural WH	—
1.b	Meanings and values of cultural WH	Information sheets on selected cultural WHs
1.c	Destruction of cultural WH/meaning of cultural identity	Video clip (1:15 min) by Deutsche Welle (2014) on the destruction of the Ancient City of Aleppo [35]
1.d	Retrospective reflection of the first focus group	—
	Second Round	
2.a	Review of the first focus group	—
2.b	Assumptions regarding the global distribution of cultural WH	—
2.c	Global distribution of cultural WH/ reasons for the global imbalance	Map and diagram showing the global distribution of cultural WH
2.d	Personal attitudes towards the global distribution/nomination process	Information sheet on the nomination process
2.e	Consequences of the WH title	—
2.f	Retrospective reflection of the second focus group	—
2.g	Selection of a destination for the site-visit (groups from Hanover only)	Information sheet on the cultural WHs in Lower Saxony

Table 2.
Structure of the focus groups.

regarding the global distribution of cultural WH. Afterwards they received an information sheet showing the current statistics (as of May 2017) and discussed possible reasons for the imbalance (phase 2.c). In phase 2.d they were provided with information on the nomination process. To conclude the topic, they were asked to discuss the necessity of actions aiming for a more balanced global distribution of cultural WH.

4. Participants' associations regarding cultural World Heritage

In summary, most participants described cultural WH as monumental buildings and focused on the past. When stating their first associations, the participants listed different types of cultural WH, mainly naming ancient buildings and monuments. Correspondingly, the most mentioned WHs include the Pyramid Fields from Giza (7 groups), the Colosseum as part of the Historic Centre of Rome (5 groups) and the Cologne Cathedral (4 groups). In contrast, cultural WHs representing modern heritage of the 20th century, industrial heritage, archaeological sites or cultural landscapes are rarely referred to.

The characteristics for cultural WH (**Figure 1**) support this first impression. While all groups assign a historical significance to cultural WH, only three groups demand a relevance for the future. In six groups it is agreed upon, that cultural WH has to be somehow connected to culture. However, the discussion within the groups uncovers different conceptualizations of culture. In group 2, participant G2_4 argues that cultural WH does not represent a whole nation but only certain

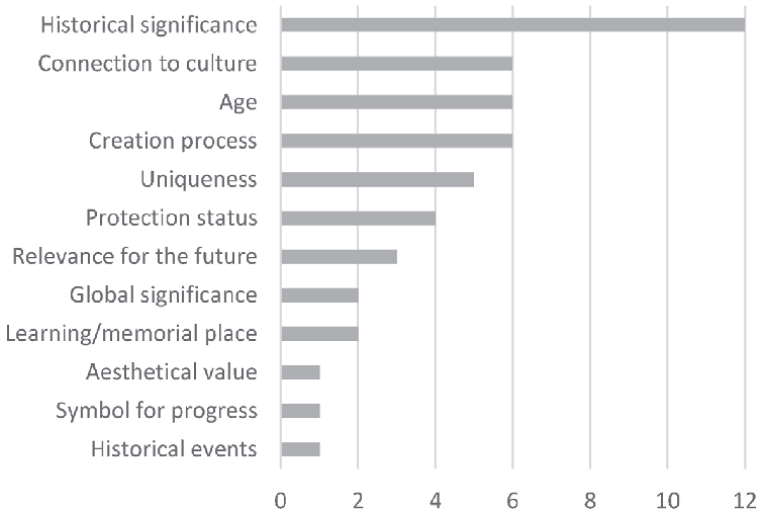

Figure 1.
Characteristics of cultural World Heritage sites mentioned by the participants.

communities since "not all people of a country share the same culture." On the contrary, the argumentation of G12_2 reflects an essentialistic conceptualization of culture that fixes different cultures to different geographical spaces: "If I'm in an ancient German town, e.g. in Trier, it is rather unlikely, that I'll find a World Heritage, that is a mosque. On the other hand, if you are in Istanbul, where you basically had the Islam forever, it is very likely to find one."

According to six groups, cultural WHs have to be of a certain age. Here the reasoning includes that WHs need to be "very old" (G1_2) or at least "not recently built" (G8_2). However, other groups question the importance of age as a relevant factor. By referring to the Elbphilharmonie, a landmark concert hall in Hamburg opened in 2017, one group discusses the possibility of contemporary cultural artefacts gaining WH status in the future.

Six groups take the creation process of cultural WH into consideration, but only two of them assume that WHs can be the combined work of nature and humans. In the other four groups it is argued, that WHs have to be made by humans.

When comparing the characteristics mentioned by the participants with the criteria and requirements by UNESCO obvious differences become apparent. In order to be listed on the WH list, sites have to be of 'Outstanding Universal Value' (OUV) [36]. The partipants on the other hand rarely name charactersistics that can be equated with the OUV. Only five groups mention uniqueness as a necessary characteristic and even less groups (2) agree upon global significance. One group explicitly decided to not list the global significance as a factor, because they perceive it as a consequence and not a requirement of the WH status. According to the Operational Guidelines, WHs also need to meet the conditions of integrity (wholeness and intactness) and authenticity (credibility or truthfulness) [ibid.]. But only one participant demands cultural WHs to be well conserved.

5. Participants' reasons for the imbalanced global distribution of cultural World Heritage

Aside from few exceptions, the presumed reasons for the imbalanced global distribution of cultural WH mentioned by the participants are backed by Eurocentric

lines of reasoning. The arguments of most participants are based on the presumption of Europe as the outstanding center of culture, world history and progress, which is contrasted with ideas about Africa, South America and parts of Asia.

Figure 2 shows, that the groups predominantly refer to demographical, historical and environmental reasons, while reasons related to imbalanced global power relations (interests of nation states, social and financial inequalities) are neglected by most groups.

Demographical reasons mentioned by the participants include time of settlement, population density, ethnical diversity and immigration. According to G10_1, there are less WHs located in Australia and America "because humans haven't lived there as long as in Europe or Asia." Participants mostly place cultural WH in large cities and justify the comparatively small amount of WHs in countries such as Russia and Canada with the low population density.

Ten groups refer to historical reasons when explaining the imbalanced global distribution. It is important to note, that in the discussions history is merely reduced to events that took place in the past, while the consequences that last up until today are not taken into account. As shown in **Figure 1**, for the participants the historical significance of a given site is the most important characteristic of cultural WH. Consequently, participants argue that the global distribution is the result of "historic facts" (G10_2). Historical importance is ascribed to the civilizations of Egypt, China and the Osman Empire, the Aztecs and Incas, Europe and particularily Greece and Germany. As a contrast, G7_4 claims that "not much happened" in Africa. Similarly, G8_2 reduces cultural archievements in Africa to the influence of colonialization and expects cultural WHs to be built by "the British and French". These lines of reasoning are exemplary for many statements, that understand colonisation as a positive stimulus for development, neglect Africas pre-colonial history and put Europe in the centre of world history.

The stated environmental reasons include climatic conditions, the natural environment and available natural resources. According to the participants, climatic parameters such as temperature and precipitation influence the creation and preservation of cultural heritage as well as the possibilities for archaeological excavations. Countries such as Russia, Canada and Greenland are thus perceived as "bad living habitats" (G6_4), where low temperatures, heavy snowfall and permafrost reduce the possibility to construct something "special" (G3_3). Similarly, G12_2 refers to desert climate to explain the low amount of cultural WHs in Africa. According to her, the desert makes it impossible to built "many buildings". At his point it becomes obvious, that the stated reasons for the imbalanced global distribution ('no buildings in the desert') are influenced by the participants' preassumptions regarding cultural WH ('cultural WH equals buildings').

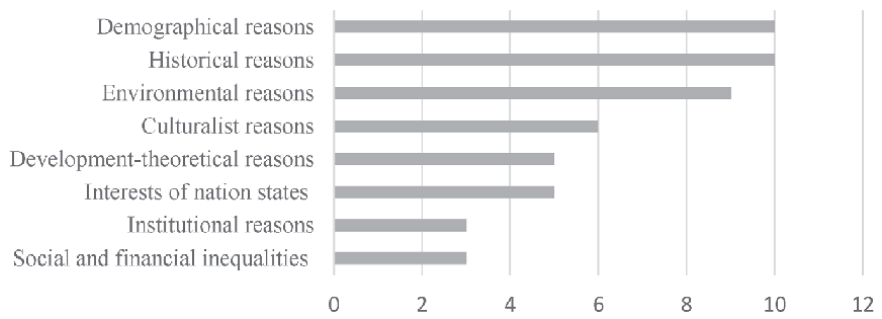

Figure 2.
Reasons for the imbalanced global distribution mentioned by the participants.

Culturalist approaches explain the global imbalance with different ways of life, values and attitudes towards the preservation of cultural heritage. Indigenous Peoples of Australia, Alaska, Siberia and Latin America are repeatedly referred to as "nomadic tribes" (G5_4) or "primitive tribes" (G3_2) and assigned a nature-oriented culture. G3_2 presumes that they "did not have the leisure to build cultural World Heritage." It is assumed, that many WHs in Africa, Asia and Latin America are related to religion and belief systems. Further it is argued, that Europeans pay more attention to preservation and conservation. G11_1 compares Europe to China, where "it doesn't matter if something is torn down. Well, maybe it matters, but there will be less resistance than in Europe."

Development-theoretical lines of reasoning use the Global North as a benchmark and explain the comparatively low number of cultural WHs in the Global South with an allegedly lagging economic and cultural development. For G2_4 lacking financial means are the "obvious" reason why communities in Central Africa "do not just build something like the Cologne Cathedral". Further, education, technical and industrial progress in the past are considered as relevant factors that influence the development of cultural artefacts and traditions, their preservation and appreciation. In their discussions, most participants place technical and cultural archievements in Europe, East Asia and the Middle East. In this context, G9_3 compares ancient Greece to the Indigenous Peoples of North America. While "advanced mathematical skills" are ascribed to ancient Greeks, she assumes that Native Americans only had "limited resources".

Five groups take the interests of nation states into account. According to the participants, national interests influence the intensity of searching for cultural heritage, the willingness to nominate sites as well as the commitment to the values represented by UNESCO. G8_2 ascribes a historically grounded lack of interest to Russia, "because they have always been separating themselves. Just like they did with the wall in Germany."

Institutional reasons are considered by three groups. According to group 4, the decision-making processes that evolve around WH have to be taken into account when discussing the global imbalance. While G4_2 suspects the European Member States to misuse their power to enforce national interests, G4_1 believes that the UNESCO ensures neutral decision-making.

Insufficient financial means as an expression of social inequality are debated in two groups. Group 5 expresses the opinion, that high cost prevent financially weak countries from submitting nominations, not the lack of potential sites. Similarly, G4_2 suspects that especially European countries have the financial capacities to carry out the required conservation and preservation measures. Furthermore, G12_2 refers to the discrimination of the North American Indigenous Peoples in the past and the consequences for the current appreciation of their heritage.

6. Particpants' attitudes towards the imbalanced global distribution of cultural World Heritage

32 of 43 participants express a personal attitude towards countering the imbalanced global distribution of cultural WH.

Of those 32 participants, 15 are against taking actions to counter the disparities. To back their argument, the participants mainly refer to the required outstanding significance of cultural WH. For example, participant G9_1 recognises the global imbalance but does not consider it necessary to reduce it. He argues that the number of cultural WHs are a justified reflection of the archievements of different cultures. G4_2 acknowledges that some countries might not have the financial resources or

cannot fulfil all the necessary requirements. However, she concludes that a balanced distribution is unfeasible, since the UNESCO is a "big institution" that does not yield to protests. Similarly, G4_1 is against taking measures, since a country just might "not have anything worth a nomination". According to her, achieving a balanced global distribution would decrease the standard and the WH title in turn lose its prestige. G1_3 holds the individual countries accountable for the disparities, since it is their decision to submit a nomination. If a state refrains from nominating WHs, it is considered their "own fault".

Similar arguments prevail among the 12 participants who have ambivalent attitudes towards countering the imbalance. G11_2 is not generally opposed to taking actions, but stresses that "it depends what a country has to offer. Europe has a lot cultural World Heritage because of religion, but Africa is more or less just prairie, there is not much to find." G12_2 suspects that some countries might lack the capacities for a successful nomination and suggests direct nominations by the UNESCO. In contrast, G4_3 refers to the sovereignty of every national state. According to her, the WH list should not be perceived as a "competition". But since some countries might feel disadvantaged, she proposes public protests.

Five participants support actions that contribute to a more balanced global distribution of cultural WH. For example, participant G5_4 argues that the WH list might confirm stereotypes and nurture prejudices by directing the attention to selected "things, places and regions". According to her, every region should receive the same attention.

Overall, most of the proposed actions to reduce the global imbalance involve the support of the Member States. Of the eight groups discussing these actions, most focus on financial help. G12_2 suggests to directly support Member States with little financial means, while G9_2 prefers the "communist idea" of an equal distribution of all financial resources. Six groups propose changes in the decision-making process. One suggestion is to transfer power from the Member States to the UNESCO or to even install a new overarching committee that is responsible for preparing the nominations. Opposed to this centralization approach, two groups propose the enlargement of the World Heritage Committee. Further, four groups suggest public participation in order to increase the transparency and legitimacy of the nomination process. G3_2 proposes an online vote which would allow everyone to participate, since the public "is the culture and it might be interesting for them to be involved in the decision."

7. Discussion

The selected results suggest that the perceptions of the participants regarding cultural WH and its global distribution are predominantly grounded in Eurocentric ways of thinking. The argumentation of many participants resembles the conceptualization of cultural heritage in the early days of the WH Programme. Although the understanding of heritage within the international scientific community as well as the UNESCO has since then become more complex and open to diverse approaches, it can be argued that in the case of Germany, the different heritage concepts have yet to reach the general public discourse [37]. The observation, that most participants express an understanding of cultural WH that focuses on historic monuments and buildings can thus be explained with the argument that nowadays heritage scholars cannot enter a local community "to assess the social significance of an old place without finding that the community's expression of that significance is not in some way influenced or structured by received concepts of heritage." [21]. Possibly, this not only holds true for specific heritage sites, but also for general associations with cultural heritage. The positionality of the participants thus needs to be taken

into account. It can be assumed that the particpants are already influenced by the AHD narrative due to media, education or sightseeing tours, even if they have never consciously dealt with the term WH.

Eurocentric thinking patterns became apparent throughout different phases of the focus groups, but specifically during the discussion of possible reasons for the imbalanced global distribution of cultural WH. In the argumentation of most participants, Europe appears as an exceptional 'haven' of culture, history and progress. Parts of Asia, Latin America and particularily Africa on the other hand are mostly associated with contrary characteristics. The use of binary opposites such as undeveloped/developed, primitivism/progress, nature/culture is considered a key concept for the understanding of the relations between the Global South and the Global North. As they suppress any ambiguity, complexity and overlap between the allegedly opposing terms hierarchies are reinforced [38]. Binarism is strongly linked to othering, first introduced by Spivak [39], which describes how the self-identity (of the colonisers) is defined in opposition to the alien Other (the colonised). In the context of contemporary heritage and museum practice, Dixon [40] has shown how the process of othering occurs in the representation of Africa and its diasporas in European museums.

In neocolonial narratives, terms such as "primitive, savage, pre-Colombian, tribal, third world, undeveloped, developing, archaic, traditional, exotic" [41] are used to degrade the Global South. Similar terms can be found in the participants' perceptions of "African tribes living in outdated huts" (G7_3), which stand in contrast to descriptions of technical progress in Europe or the achievements of ancient civilizations.

These descriptions uncover a linear understanding of development. They can be traced back to a central idea of the European understanding of modernity, that assigns different geographical areas to different stages of development (e.g. 'developing countries', 'emerging markets', 'developed countries') [42]. As a result, the 'developed way of life' is used as a benchmark. Deviations to this standard are commonly problematised and can seemingly only be overcome by technical solutions and external help. This understanding perceives global disparities as the result of lagging 'development' instead of unequal global power relations [43]. This depoliticising approach can also be found in the development-theoretical reasons of the participants which refer to lacking knowledge and skills as well as in the marginal consideration of institutional reasons.

Further mechanisms that reproduce existing hierachies include exoticism, neglection of (precolonial) history and essentialism [38]. Frequently, statements concerning the Global South or Indigenous Peoples of North America and Australia mention tribes, religion and belief, connection to nature and rural areas. The precolonial history tends to be ignored, whereas colonialism is perceived as a positive cultural influence. From the participants' view, this is especially true for Africa, which is mostly described as historically insignificant, the only exceptions being ancient Egypt and references to Africa as the origin of humanity. The negation of African history, the simultaneous exoticism of the continent and the discrimination of its people cannot be reduced to the work of past European philosophers (e.g. [44]) but continue to shape todays representations of Africa [45–47]. The results of this study also support previous research that has pointed out the stereotypes and prejudices of German secondary school students regarding Africa [48, 49].

Moreover, many explanations for the imbalanced distribution of cultural WH have their roots in environmental determinism. This dominating paradigm of 'western' geography in the late 19th and early 20th century relied on climate parameters and the natural environment to explain differences in human behaviour,

cultural practices or the "race temperament" [50]. The resulting classification of human-beings into groups of different characters, abilities and intellects in turn justified repression, exploitation and colonialism [51].

The imbalanced global distribution of cultural WH is considered a minor issue by most participants and counter-actions are thus only demanded by a minority. This is consistent with the observation, that the legitimacy of the decision-making processes concering WH is mostly unquestioned. The nomination process as well as the final decision by the WH Committee are largely considered indisputable. Most of the participants see the committee's decision as a mere formality and expect a confirmation of the OUV. As the legitimacy of the UNESCO and the WH Committee is taken for granted by most participants, only little adaptions to the existing institutional framework are suggested. This includes offering financial help to poorer Member States, which feeds from a paternalistic division in donor and receiving countries [43]. Similar observations have been made by Fischer et al. [52] in a study that explored perceptions of globalisation among secondary school students in Lower Saxony, Germany. The participants also rarely challenged existing global political hierarchies and international decision-making processes and saw little need for changing the statuts quo.

It has to be taken into account, that the participants of the study presented in this chapter were not aware of the public and scientific debate concerning the global imbalance of WH. They could only argue on the grounds of the basic information they received as well as their own assumptions.

Across the participants' associations regarding WH as well as in the stated reasons for the imbalanced global distribution a focus on history is apparent, which might be explained by a synonymous use of history and heritage. According to Lowenthal, those are two fundamentally different concepts. While history seeks to describe the past, "[h]eritage is not like this at all. It is not a testable or even reasonably plausible account of some past, but a *declaration of faith* in that past." ([53], emphasis in original) The concept of heritage as a cultural process of meaning-making resulting from the conscious acts of labelling, classification, selection and deliberate omission [3] is thus foreign to most participants.

8. Conclusion: towards a postcolonial approach to World Heritage Education

In this chapter we have presented and discussed selected results of a qualitative study exploring cultural WH from the perspective of secondary school students in Lower Saxony, Germany. The analysis of the participants' associations with cultural WH and the stated reasons for the imbalanced global distribution, has uncovered a domination of Eurocentric lines of reasoning. The results of the study thus confirm the urgent need for decolonising WHE by means of including critical and reflexive approaches to education. Hence, WHE has to go beyond the mere instrumental interest of transmitting unquestioned content knowledge. Following this understanding, raising awareness for WH and its safeguarding should by far not be the only objective of WHE. To gain credibility and – most importantly – relevance, WHE needs to challenge dominating Eurocentric thinking patterns and pick up and reflect on global challenges.

The educational resources known to the authors currently fail to address the issues that have been criticised in the past and/or still are today. Within the WH programme, an incremental shift to a more inclusive and complex understanding and management of cultural WH has taken place, but unfortunately current

educational resources do not reflect these reforms. The definitions and related procedures of WH are presented as given facts, and not as the results of negotiation processes that have been adapted in the past and will probably be adapted again in the future. The critique that has been voiced in the past [e.g. 3, 9, 54], should not only be limited to internal or academic debates, but explicitly be reflected in WHE.

As colonial knowledge systems persist in education, language or cultural attributions, they subconsciously structure our mindset. Tlostanova and Mignolo [55] thus call out "to start learning to unlearn [...] in order to relearn", meaning to break free from imposed thinking patterns and develop an reflective practice. The adoption of critical and reflexive thinking in WHE can build upon the approaches offered by critical and decolonial Global Citizenship Education (GCE) [56, 57]. According to Andreotti [58], critical GCE aims at tackling epistemological questions and reflects on "how we came to think/be/feel/act the way we do and the implications of our systems of belief in local/global terms in relation to power, social relationships and the distribution of labour and resources." In comparing different frameworks for GCE, she describes "power, voice and difference" [58] and discussing the root causes of global disparities as central aspects of critical GCE. In the context of WHE this could for example include a conscious examination of how terms such as the OUV are defined and understood in guidelines, by ICOMOS or academic scholars. Here, Mignolo [59] offers a helpful critique of the term 'universalism' without falling back to cultural relativism. Instead, he argues that the universalisation of experiences, as proclaimed by colonialism and imperialism, is not feasible.

Next to questioning underlying concepts of WH, critical and reflexive approaches in WHE should also deal with the representations and personal meanings of specific sites. Cultural WH is a highly visual field, images of iconic features represent whole destinations and can directly influence the visitor experience [60]. Regarding reflexive learning experiences on site, hermeneutic photography has proven useful. In the described research project, participants visited a local WHs and were asked to take two photos. The first photo represented a universal view of the site, while the second photo showed a personal view [32, 61]. This exercise can be used as a starting point to discuss different meanings of given sites, point towards conflicts between prescribed universal values and personal meanings and reflect upon how iconic images shape WHs as *place*.

To conclude, we call for a WHE that is grounded in a critical and decolonial GCE. The core of such a WHE should be

a. developing an awareness for one's own perception of heritage.

b. sensitising for other perceptions and meanings of heritage, especially respecting the perspectives of locals.

c. reflecting upon how different understandings are tied to specific contexts, knowledge systems as well as personal experiences.

This is based on the assumption that one must become aware of one's own perceptions in relation to other views in order to be able to expand one's own perspective. The different perceptions hold by learners and people who live/work nearby WHs are thus a resource which needs to be tapped. In general, the question 'Who talks when and were how about WH?' has to be tackled. For decolonising WHE we recommend to reflect upon personal meanings of WHs in, for example, sub-Saharan Africa as a kind of 'a voice off' and compare these considerations with 'voices from within' [49].

For educational activities and learning resources we suggest to explicitly uncover and deconstruct Eurocentric thinking patterns and integrate post- and decolonial approaches. Teachers and heritage interpreters need to made aware of how the heritage of different countries, cultures or communities is represented in learning resources. Special attention should be paid to language to avoid reproducing cultural hierarchies by using degrading terms.

Further the interests and procedures of the involved stakeholders in the context of WH have to be questioned. WHE and heritage in general needs to be understood as the result of a cultural social process influenced by power relations and national interests. In the previous section it has been become apparent, that education has to foster a critical attitude towards 'development' and especially terms such as 'developing/developed countries'. At first glance, the connection of WH and 'development' might not seem obvious. However, with the proclaimed contributions of WH to sustainable development [62, 63], we claim that WHE is obliged to tackle questions such as 'What does development mean?' or 'How can different development paths look like?' At this point it becomes apparent that the adoption of critical and reflexive thinking in WHE offers the chance to take up challenging topics that go far beyond the previous core themes of WHE.

It would be desirable if educational activities and resources in schools as well as at WHs involve critical discussions of the WH programme, reflexive methods, and increasingly establish a dialogue with other WHs so that the claim of transnational validity can be accounted for. First suggestions for how to implement critical and reflexive approaches in WHE in school will be published in a textbook in 2021 [64]. There, we have included topics such as changes in the conceptualization of cultural WH, the imbalanced global distribution of WH or heritage of the transatlantic slave route (e.g. Jazz as protest music, colonial heritage in the Global South and North, local (post)colonial heritage) and proposed methods such as hermeneutic photography.

It needs to be stressed, that the mentioned suggestions for educational activities are just a beginning. They have no claim for completeness and should be regarded as consequences of this particular study. Since the focus was purely on young people's perceptions of cultural WH, no conclusions can be drawn regarding the interpretation of natural WH. We suggest, that further studies on the perceptions of young people regarding WH include cultural and natural WH, as well as intangible cultural heritage. In the future, a similar exploration of young people's perspectives could be conducted in the Global South. Such a study would not only enrich the academic discussion, but also produce material (e.g. photos or quotes) that can be included in educational resources in the Global North. This suggestion does not only aim for identifiying different perspectives on heritage, but also to find similarities and build a common ground.

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Conflict of interest

The authors declare no conflict of interest.

Notes

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Chapter 3

Heritage Language Use, Maintenance and Transmission by Second-Generation Immigrants in Cyprus

Sviatlana Karpava

Abstract

There are both culturalist and structuralist approaches to the integration of the second-generation immigrants into mainstream society. These approaches focus on cultural, linguistic and socioeconomic assimilation. Successful societal membership is associated with psychosocial adaptation, hybrid identity, selective acculturation or biculturalism, which is an individual's adjustment to new psychological and social conditions. Individual identity is related to the sense of belonging, integration and engagement in the current space. Self-identity is fluid and flexible; it comprises individual and collective identity, habitus or unconscious identity, agency and reflexivity, which is re-evaluated and adjusted throughout the life trajectory of a migrant and connected to citizenship and solidarity. This study investigated heritage language use, maintenance and transmission, as well as language and cultural identity and social inclusion of second-generation immigrants in Cyprus with various L1 backgrounds. The analysis of the data (e.g. questionnaires, interviews, focus group discussions, observations) showed that second-generation immigrants have a hybrid language and cultural identity, as well as multifarious perceptions regarding citizenship, inclusion and belonging. These immigrants try to assimilate to the target society, but at the same time they have a strong link with the community of residence, their L1 country and their heritage or home language. The participants also use mixed/multiple languages at home and elsewhere.

Keywords: heritage language use, maintenance, transmission, language and cultural identity, second-generation immigrants

1. Introduction

Globalisation does not necessarily mean homogenisation: intercultural understanding and education should be promoted [1], with an "open and respectful" dialogue between/among interlocutors with different ethnic, cultural, religious and linguistic backgrounds and heritage on the basis of mutual understanding and respect" ([2], p. 10). Multicultural backgrounds and identities are not restricted to ethnic, religious and linguistic traits. Culture includes "experience, interest, orientation to the world, values, dispositions, sensibilities,

social languages, and discourses" ([3], p. 173]). It is a challenge for educators to address cultural diversity [4].

Cultural diversity is one of Europe's most valuable assets, and European educational and cultural systems need to embrace diversity and enable all citizens to build the skills and competences needed for effective inter-cultural dialogue and mutual understanding. The challenge is in understanding how young people make sense of Europe and its different cultures. The influences on young people are wide ranging, including formal education, family and cultural background and media. [5] and "ongoing relationships of negotiation, compromise, and mutuality" ([6], p. 351). It is important to develop cultural literacy, intercultural dialogue and mutual understanding [7].

This study investigates heritage language use, maintenance and transmission, as well as language and cultural identity and social inclusion of second-generation immigrants in Cyprus with various L1 backgrounds. According to [8], there are culturalist and structuralist approaches to the integration of second-generation immigrants into mainstream society: these approaches focus on cultural, linguistic and socioeconomic assimilation. Successful societal membership is associated with psychosocial adaptation, hybrid identity, selective acculturation or biculturalism, which is an individual's adjustment to new psychological and social conditions [9–11]. Individual identity is related to the sense of belonging, integration, engagement in the current space [12]. Self-identity is fluid and flexible; it comprises individual and collective identity, habitus or unconscious identity, agency and reflexivity, which is re-evaluated and adjusted throughout the life of a migrant and is connected to citizenship and solidarity [13]. We addressed the needs of young adults and second-generation immigrants in Cyprus and their linguistic and cultural identities, knowledge, skills and competencies required for intercultural dialogue and mutual understanding for promotion of tolerance, empathy and inclusion in Cypriot society [7, 14].

Alternative views and cultures should be accepted with "an absence of prejudice, racism or ethnocentrism" ([15], p. 1033), and tolerance is needed for genuine dialogue. "If there is no gap then there is no dialogue and if there is no dialogue then there is no meaning." [16]. In a multilingual, pluralistic society, with social responsibility and sustainable development, it is important to position ideas carefully, to engage meaningfully in a dialogue and to discuss and respect interlocutors. Educational programs (for immigrants and members of the local community) should include issues of social responsibility, diversity, multiculturalism, intercultural dialogue, citizenship and cultural literacy, collaborative co-construction, adaptive education, communities of practice, globalization and inclusion. The effect of the pandemic and resultant societal actions should also be considered.

2. Acculturation and multicultural societies, language/culture identity

Acculturation presupposes a multidimensional and interactive perspective on attitudes, behavioural repertoires, life domains, changes and cross-cultural transitions [17–19]. The four behavioural acculturation orientations are distinguished by [17]: (1) integration, maintenance of cultural heritage and adoption of new cultural traits; (2) assimilation, relinquishing of cultural heritage and replacement with new cultural traits; (3) separation, maintenance of cultural heritage and refusal to adopt new cultural traits; and (4) marginalisation, refusal of both heritage and new cultural traits ([20], p. 2). According to the Acculturation Model (IAM) [18], there can be a (mis)match between ideologies and orientations of immigrants and the receiving community members (RCM) that can lead to both negative and positive

consequences such as negative psychological self-esteem in immigrants [18, 21] and the perpetuation of perceived threats in both groups, [20–25].

In many societies, there is a tension between immigrants and RCMs, as the former tend to prefer integration, whereas the latter advocate assimilation of migrants, undermining the potential of a pluralistic community and threatening cultural maintenance of new speakers [22–27]. There could be also differences regarding public (e.g., work, school, other shared spaces) and private domains (e.g., within families, values/belief systems) and acculturation strategies and expectancies, adaptive requirements or acculturative pressures [19, 28–32]. The age of migrants and their date of arrival in the host country (child vs. adult, length of residence in the country, first, second, third generation of immigrants) are important factors that affect acculturation strategies associated with established identities and/or fewer educational and socialization opportunities [33, 34]. Previous research shows that RCMs are more tolerant of first-generation immigrants maintaining their heritage language and culture than they are of second- or third-generation migrants doing the same [35–37].

The issue of hybrid identities should also be considered (adult vs. child immigrant, first, second, third generation) [38] related to the attitudes of the receiving society, social networks, bilingualism, multilingualism, transnationalism, assimilation and integration [39, 40]. The analysis of intergroup relations and their impact on acculturation, eradication of prejudice, anxiety and discrimination, and increase of contextualisation, empathy, inclusion and mediation is essential [41]. Acculturation is considered a complex, situated, and dynamic process associated with uncertainty and unfamiliarity of accommodation that usually immigrants or new speakers in society usually face [20]. Complex dynamics of multicultural contact between immigrants and RCMs usually take place at the local level (local communities) [42–45]. These contacts are affected by various factors such as attitudes, behaviours, practices, expectations, intercultural dialogue [18] and shared space related to social status and power, values, norms, mutuality, cooperation and identification [46–48]. Inter-ethnic relations are based on power hierarchies and distinction between 'dominant and 'nondominant' cultural groups [49] and mostly a one-way acculturation that has to be initiated by immigrants rather than the result of reciprocal acculturation strategies and expectancies of both immigrant and receiving communities [20, 50, 51]. This could be related to community members' fears of losing power (cultural, sociopolitical or economic) associated with realistic and symbolic threats. Such fears can often be reflected in the mainstream media [52].

Language, culture and personal and social identities are closely related. This relationship can become quite complex in multilingual and multicultural settings [53–55]. According to [56], our ethnocultural identity is indexed, shaped and redefined by the languages we speak. Immigrating to another country creates the need for an immigrant to integrate into a new culture but also keep links with their ethnic identity and heritage culture [57–59]. In the case of second-generation immigrants, the situation is even more complicated; quite often they have bi–/multilingual, bi–/multicultural, hybrid identity [60] as they belong to two or more cultures and have competencies in the majority and minority languages [61–63].

Previous research on second-generation immigrants showed that the sense of belonging to heritage language and culture depends on the level of heritage language proficiency [64], although there are variations among different ethnic groups. Heritage language literacy is also an important factor that affects linguistic and cultural identity of heritage speakers [65–69] and their access to historical and cultural heritage [70] via the home literacy environment [67, 71], school language programs [54, 65] or community-based language schools [68, 72].

In this study we aimed to answer the following research questions:

1. What are the linguistic and cultural identities of second-generation immigrants in Cyprus?

2. Is there any difference in the composition of their Dominant Language Constellations?

3. What are the factors that affect heritage language use, maintenance and transmission and social inclusion of second-generation immigrants in Cyprus with various L1 backgrounds?

3. Study

3.1 Participants

This study investigated the language and cultural identity of second-generation immigrants in Cyprus with various L1 backgrounds: Russian, Georgian, Ukrainian, Bulgarian, Romanian, Arabic, Polish, Albanian and English. Thirty participants took part in the research, their ages ranging from 18 to 27 years old (mean = 22.6; SD = 2.82), with eight males and 22 females. Thirteen of the respondents were born in Cyprus, while the rest were exposed to Greek when they were from two to 16 years old (AoO: Mean = 3.73; SD = 4.33). Overall, their length of residence in Cyprus ranges from 9 to 26 years (Mean = 18.93, SD = 4.98), see **Table 1**.

3.2 Materials and procedure

We implemented a mixed-method study [73] by combining methods that complement one another and shed light on important questions in our research [74–79]. We had a multimodal perspective for the analysis of our data (questionnaires, interviews, observations and field notes) [80–83].

For data collection, we used questionnaires, both paper-based and online versions [84]. According to [85], questionnaires are employed "as research instruments for measurement purposes to collect valid and reliable data" (p. 3). The researcher worked on the preparation of the questionnaires, taking research design into consideration as well as the criteria for participation, the formulation of the questions and items, length of the questionnaire and the balance between conciseness and completeness [84, 85].

Online questionnaires have the advantage of anonymity, as there is no face-to-face contact with the researcher. This means there is less pressure to participate and thus more honest responses can be elicited. In addition, web questionnaires can reach more participants and more diverse populations worldwide, with different language backgrounds, thus boosting the ecological validity of the data [74, 84]. However, it should be noted that online questionnaires have one major limitation: the self-selection bias [74], which is why we implemented both web- and paper-based questionnaires. We used probability sampling in order to have a representative sample of the general population and vulnerable or closed niche groups, so that our results are generalisable [86]. We carefully interpreted the results in order to avoid self-selection bias [87–89]. The researcher tried to balance the data/participants in terms of age, L1 background, education and gender [90, 91]. Our questionnaires were multilingual (Greek, English and Russian).

N	L1	G	Age	CoB	LoR	AoO	LI	CI	SOC	LR	DMC
1	R	F	20	R	14	6	R + G	R + G	FM	R + G + E	R + G + E
2	B	F	20	B	10	10	B	B + CG	H	B + G + E + S + Rus	B + G + E
3	L	F	26	C	26	0	L + G	L + CG	H	L + G + E + F	L + G + E
4	A	F	23	C	23	0	G	CG	FM	G + E + A	G + E
5	Rus	F	20	C	20	0	G + Rus	G + CG + Rus	FM	G + Rus + E + S	G + R + E
6	Ukr	F	21	Ukr	9	12	Rus + Ukr + G + E	Rus + CG	H	Rus + Ukr + G + E	Rus + G + E
7	Ge	M	20	G	18	2	G + Rus + E	Ge + CG + Rus	H	G + Rus + E	G + Rus + E
8	Arm	F	23	F	23	0	Ar + CG	Ar + CG	FM	Ar + E + G + F + Ger	Ar + E + G
9	Rus	F	19	C	19	0	G	G + Rus + CG	H	G + Rus + E	G + Rus + E
10	A	F	22	C	22	0	G + A	G + A	FM	G + A + F + E	G + A + E
11	R	M	25	G	20	5	G + Rus	Rus	FM	Rus + G + E	Rus + G + E
12	A	F	27	1	11	16	A	A	FM	A + E + G	A + E + G
13	P	M	25	C	25	0	P + CG	P + CG	H	P + CG + E	P + CG + E
14	Ukr	F	26	Ukr	16	10	Ukr + Rus + CG	Ukr + Rus + CG	H	Ukr + Rus + CG + E	Ukr + Rus + CG + E
15	Alb	F	18	G	19	0	G + Alb	G + Alb	H	Alb + G + E + It	Alb + G + E
16	E	M	25	Eng	20	5	E + G + F + It	G + CG + It	H	E + G + F + It	E + G + F + It
17	E	F	23	C	23	0	E + G + A	E + CG + A + T + Rus	H	E + G + A + Rus	E + G + A + Rus
18	G	F	19	G	10	9	G + T + Rus + E	G	H	G + T + Rus + E + It	G + E + Rus
19	R	F	18	R	10	8	R + E + G	R	H	R + E + G + S	R + E + G
20	G	F	25	G	21	4	G + E	G + E	H	G + E + S + It	G + E

N	L1	G	Age	CoB	LoR	AoO	LI	CI	SOC	LR	DMC
21	G	F	22	G	19	3	G + E	G	FM	G + E + It	G + E
22	G	F	22	G	18	4	G	G	H	G + E + Ger + F	G + E
23	E	F	18	C	18	0	CG + E	CG + E	H	CG + E + T	CG + G + E
24	R	M	25	G	19	6	G	G + Rus	FM	G + Rus + E	G + Rus + E
25	A	F	25	C	25	0	Ar + G	Ar + CG	FM	Ar + G + E + F	Ar + G + E
26	R	F	22	G	19	3	G + Rus + E	G	FM	Rus + G + E + S + It	G + Rus + E
27	G	F	27	G	23	4	G + E	G + CG	H	G + E + Ger	G + E
28	R	M	24	C	24	0	G + Rus + E	G + Rus + E	H	G + Rus + E + F	G + Rus + E
29	Ge	M	23	G	18	5	Ge + Rus	Ge + Rus + G	H	Ge + Rus + G + E	Ge + Rus + G + E
30	Ge	M	26	C	26	0	G + Rus	Rus	H	G + Rus + E + Ge + F	G + Rus + E

N = number; L1 = native language; G = Gender; CoB = Country of birth; LoR = Length of residence in Cyprus; AoO = Age of onset to Greek; LI = Language identity; CI = Cultural identity; SOC = society; LR = linguistic repertoire; DLC = Dominant Language Constellation; F = female, M = male; FM = full member. I'm a full member of the society with equal rights; H = Hybrid: I belong to both this society and my home country society; R = Romania; I = Iraq; P = Polish; B = Bulgaria; C = Cyprus; Eng = England; Ukr = the Ukraine; G = Greece; Ge = Georgian; Ar = Armenian; E = English; G = Greek; CG = Cypriot Greek; Ukr = Ukranian; Ger = German; T = Turkish; It = Italian; Alb = Albanian; B = Bulgarian; S = Spanish; Rus = Russian; A = Arabic; L = Lebanese; F = French.

Table 1.
Participants.

We also used oral interviews as not all of our participants had enough self-confidence, metalinguistic and metapragmatic awareness of language practices and a genuine interest in the topic as well as literacy skills in one or more languages [84, 90]. The interviews allowed us to have a person-centred, experiential focus on the participants' experiences regarding cultural heritage and to obtain in-depth information unavailable to direct observation. The participants expressed themselves regarding the culture-related matters, immigration experiences, multilingualism, multiculturalism, integration and social cohesion; they also explained their motivations and related their personal stories [92]. The researcher acted as responsible and active interviewer and tried to find responsive and willing interviewees [92–95].

We had face-to-face and online interviews (via Skype, Microsoft Teams). Our interviewees represented a cross-sectional sample of a specific target population (immigrant second-generation population in Cyprus) [96]. It is important to use standardised procedures (the same question items or prompts in the same order and manner) supplemented by extended or open-ended responses, which is a more flexible, conversational style of survey interviewing [97, 98]. The ecological validity of the survey was enhanced by piloting our research tools and materials, assessing the quality of the questions, protocols and potential responses [99–101]. (Auto) Biographical interviews helped us to elicit the personal histories, life trajectories, key events and first-person narratives of our participants [102–107].

Interviews are research instruments for "data collection" knowledge collection" or "data mining" ([95], p. 57), "excavation" ([108], p. 141) and "harvesting psychologically and linguistically interesting responses" ([92], p. 229, [109], p. 206). Both semi-structured interviews and focus group discussions were implemented [74, 100, 110–113]. The interviewer needs to be a flexible, patient and active listener with a good memory and strong inter-personal communication skills in order to collect the data and manage the unpredictability of the interview situation [95, 101, 114]. The interview goals and objectives were determined, and the interview schedule was prepared. The meeting place and time of interview were taken into consideration as were the recording equipment and participant informed consent forms [92].

The role of an interviewer in focus group discussion was to moderate discussion focused on the topic at hand in order to record the varied viewpoints and experiences of the participants [95, 115]. The moderator was active throughout the discussion in order to keep it flowing in a non-directive way by checking and clarifying (using prompts around a topic, issue, open-ended question) and making sure that all members of the group participated. The size of the group varied from six to 12 participants [74, 114, 116–119]. It is essential for the researcher to have interviewing skills (flexibility, self-control, cross-cultural and pragmatic competence, empathy, time management, the ability to maintain discussion and enable all members to participate) [118, 120–122].

Interviews and focus group discussions were suitable for our exploratory study. The participants were able to express their views, attitudes, priorities and values regarding multilingualism, immigration experience, heritage language use, maintenance and transmission, linguistic and cultural identities, acculturation and integration; multiple focus groups were implemented [95, 115, 118]. Focus groups are equalisers: they are non-discriminatory and do not pressure reluctant or shy participants to speak [115, 122]. We used audio recordings, so it is important to establish rapport with the participants and to be an open, sympathetic and interested listener so that interviewees can talk freely and honestly [94, 95, 101, 123]. Language and interculturality were taken into consideration. Our participants have different L1s and cultural backgrounds; thus, we use a

lingua franca or shared language to communicate (e.g., English or Greek) or the L1 language of the participants [124–126].

In addition, for our data collection we implemented observations and fieldnotes [127–130] as part of our ethnographical study focused on immigration, acculturation, integration, linguistic and cultural heritage, heritage language use, maintenance and transmission and language and cultural identities [131–135].

Observations allowed the researcher to observe particular features of immigrant communities in their own contexts in Cyprus, audio record interactions and apply an analytic framework of post-observation [136]. An ethnographic approach and an emic perspective in our research revealed the context and the world of immigrant communities in Cyprus, their cultural heritage, interaction with the local population, their integration into Cypriot society and their needs, opportunities and challenges. The researcher talked to the participants, took part in local (cultural) practices (home, schools, neighbourhoods, institutions), observed and took fieldnotes [137–139]. The researcher gained access to the research site and managed to develop relationships with research participants [130, 139, 140]. These fieldnotes are defined as "productions and recordings of the researcher's noticing with the intent of describing the research participants' actions" ([141], p. 44).

A corpus was built from the fieldnotes used for further interpretative analysis, with coding and emergent themes and categories in line with the grounded theory [142–144]. We aimed to have valid and reliable results; thus, we used a mixed-methods approach to data collection and analysis, complementing questionnaires by interviews, observations and fieldnotes [15, 143, 145, 146]. The researcher was also able to produce vignettes based on the observation and fieldnotes. A vignette is "a focused description of a series of events taken to be representative, typical or emblematic" ([130], p. 260, [147], p. 81).

4. Results

The analysis of the data showed that only 6 of the participants stated that they identify themselves with only one language (language identity), mostly with Greek (4) or L1, in particular Arabic (1) and Bulgarian (1). Most of the participants (15) have a hybrid language identity and identify themselves with 2 languages: including Greek (13) or Cypriot Greek (2) and their L1/Ln, in particular, Romanian (1), Lebanese (1), Russian (4), Armenian (2), Arabic (1), Polish (1), Albanian (1), Georgian (1) and English (4). The other participants (7) identify themselves with 3 languages: Greek (6), Cypriot Greek (1), Russian (4), English (3), Ukrainian (1), French (1), Italian (1), Arabic (1), Romanian (1). And only 2 participants have a hybrid linguistic identity associated with 4 languages: Greek (2), English (2), Russian (2), Ukrainian (1), Turkish (1), see **Table 1** and **Figure 1**.

As for the cultural identity, 9 participants identify themselves only with one culture: Greek (4) and Cypriot Greek (1) and their L1: Russian (2), Arabic (1), Romanian (1). It should be noted that only in 3 cases (Participants 4, 12 and 22) is there an overlap between cultural and linguistic identity. The other respondents (13) stated that they have a hybrid cultural identity, a combination of two cultures: Greek (6), Cypriot Greek (8), Bulgarian (1), Lebanese (1), Russian (2), Armenian (2), Arabic (1), Polish (1), Albanian (1), English (2), see **Table 1**. In total, there was an overlap between cultural and linguistic identity in 10 cases. The rest of the respondents (7) stated that their hybrid cultural identity is associated with 3 languages: Greek (4), Cypriot Greek (5), Russian (6), Georgian (2), Ukrainian (1), Italian (1), English (1). Only in 2 cases are there is an overlap between cultural and linguistic identity. Only one participant (Participant 17) has a hybrid cultural

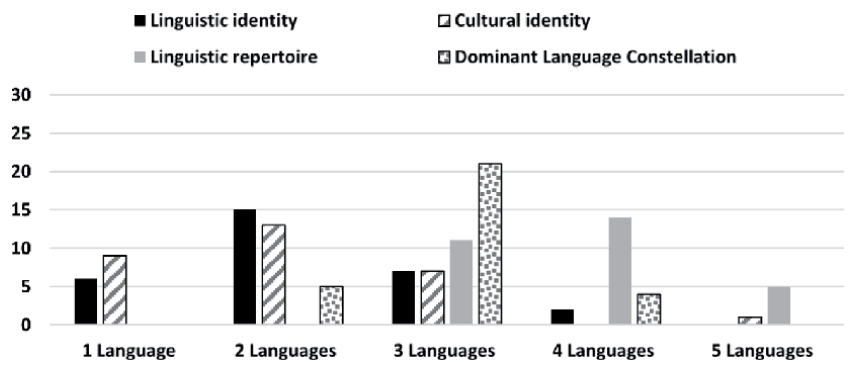

Figure 1.
Linguistic and cultural identity, linguistic repertoire and DLC of the participants.

identity that is associated with 5 languages and countries: English, Cypriot Greek, Arabic, Turkish and Russian (see **Table 1** and **Figure 1**). One third of the participants (11) believe that they are full members of Cypriot society, while the rest (19) consider themselves part of both the majority and the minority (home country) society.

As for the linguistic repertoire of our participants, its constitution ranges from 3 languages (11 participants: Greek (9), Cypriot Greek (2), English (10), Romanian (1), Arabic (2), Russian (4), Polish (1), Italian (1), Turkish (1), German (1)), to 4 languages (14 participants: Greek (13), Cypriot Greek (1), English (14), Lebanese (1), French (6), Russian (6), Ukrainian (2), Arabic (2), Albanian (1), Italian (3), Spanish (2), German (1), Georgian (1)) and 5 languages (5 participants: Greek (5), English (5), Russian (4), Bulgarian (1), Spanish (2), Armenian (1), French (2), German (1), Turkish (1), Italian (2), Georgian (1)) (see **Table 1** and **Figure 2**).

Concerning Dominant Language Constellations (DLC), the vehicle languages of our participants, the data analysis has revealed that 5 participants have only two languages, in particular Greek and English. Most of the participants (21) have 3 languages in their DLCs (Greek (20), Cypriot Greek (2), English (19) and their L1: Romanian (2), Bulgarian (1), Lebanese (1), Russian (10), Armenian (2), Arabic (2), Polish (1), Albanian (1)) and 4 languages (4 participants: Greek (3), Cypriot Greek (1), Ukrainian (1), Russian (3), English (4), French (1), Italian (1), Arabic (1),

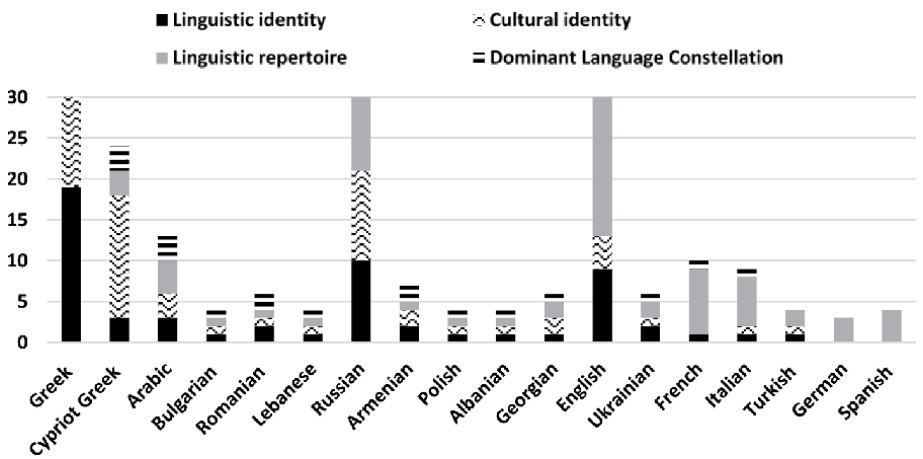

Figure 2.
Language: Linguistic and cultural identity, linguistic repertoire and DLC of the participants.

Georgian (1)) (see **Table 1** and **Figure 1**). It should be noted that there is an overlap between linguistic repertoires and DLCs (7 cases for 3 languages and 4 cases for 4 languages). Overall, the major pattern of the DLC for our participants is Greek, English and their L1s (see **Figure 3**).

Hybrid language and cultural identity depend on the amount of time spent in a particular country and the language proficiency in the target language as well as on the type of the family (whether it is a culturally mixed marriage, bilingual, multilingual or not). See the following examples:

Both cultures, because I am Romanian and Greek because I moved to Cyprus and I learned their customs and slowly I started doing the same things that they do. (Participant 1).

Cypriot culture because my mother is Cypriot and also because I have been here long enough to identify as Cypriot. (Participant 7).

Georgian, Pontic Greek, Russian, Greek-Cypriot because I was raised among all of these cultures (Participant 29).

Armenian culture because I grew up in the Armenian community of Cyprus and Cypriot culture and was born and live in Cyprus. (Participant 8).

I identify myself with Albanian culture because my parents are both Albanian. Also, I identify myself with Greek culture because I was born and raised in Greece and I am still living in Greece. (Participant 15).

Strong links with the L1 country and culture, history and traditions, cuisine, TV programs, heritage language use, maintenance and transmission: these are some of the factors that contribute to the L1 cultural identity:

I identify myself with both Lebanese and Cypriot culture. As immigrants, my parents always encouraged me and my brother to stay in touch with our Lebanese culture by following most of its traditions and values. For example, we celebrate Mother's day on the 21st of March instead of the 8th of March, the day it is celebrated in Cyprus. In addition, we were always in contact with the Lebanese culture through television. In the house we only have cable TV with Arabic channels and not Cypriot or Greek ones. Also, most dishes that we cook at home are Lebanese. At the same time, I also identify myself with the Cypriot culture, because I was raised there and most of my friends that I grew up with are Cypriots. And many traditions and values that I follow now as an adult belong to Cypriot culture. (Participant 3).

Pontic Greek because my father is Pontian and the relatives that are living here are from my father's side. So, I grew up on Pontic traditions. Russian because my mother is Russian and Pontic celebrations and some traditions were mixed with Russian after the Asia Minor Catastrophe because they had to migrate to Georgia

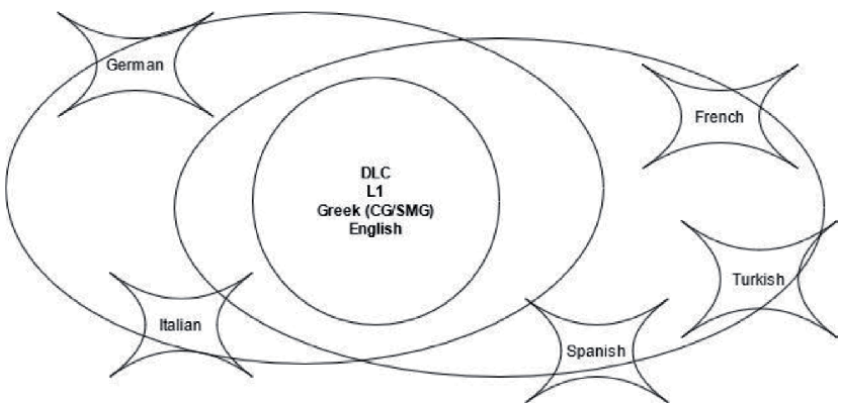

Figure 3.
DLC of the participants.

and other USSR countries. Greek because at the end of the day Pontic Greeks are Greeks. Cyprus, because I was born here and after all these years their culture grew on me as well. (Participant 9).

Linguistic behaviour of both mother and father is of great importance as well as of the extended family and relatives. Linguistic and cultural identities are affected by customs, material culture, stereotypical rules and the L1 background of the participants:

Cypriot, Greek and Russian: I identify myself with the particular cultures due to the matters of origin; my mother is Russian, and my father is half Cypriot and half Greek. I grew up with relatives from all three countries, being heavily influenced, and having consistent associations with the countries' cuisines, customs, prejudices as well as manners and/or ethics. (Participant 9).

The cultures I identify with myself are Cypriot and English since my father was born in England and came to Cyprus when he was four. Also, my father has a stepsister from the UK. His stepsister and her family used to come to Cyprus every summer and we used to spend a lot of time together. So, I kept learning from them and practiced as well. (Participant 23).

The participants also commented that the majority speakers, Greek Cypriots, also have a favourable view of multilingualism in Cyprus, although they admit that there is a difference between the younger and older generations of CG populations regarding the acceptance/discrimination of "foreign" influence in Cyprus: the former tend to be "more open-minded". Their attitudes depend on immigrant/minority language(s) status, socio-economic factors, level of the majority language proficiency.

My answer is yes and no. Some people are but some are not. When I moved to Cyprus in 2007 there was more racial discrimination, but now they are more open minded. (Participant 19).

Personally, I did not experience discrimination, but some people from other countries did, and I have seen it. The main reason for discrimination was that they do not speak the language correctly. (Participant 1).

Most of the residents accept people who speak other languages than their own; they often ask you something about your culture or even try to learn your language. (Participant 2).

Greek Cypriots can have a negative attitude towards foreigners if they speak their own L1s and cannot be understood. Some of them make stereotypical judgements:

At primary school because people could not understand my language, some of them were annoyed because they thought that I was talking about them in a negative way. (Participant 2).

I think as a community in Cyprus we are open towards people who speak other languages; not every one of us, but I think most of us (Participant 10).

Sometimes in Cyprus stereotypes come up such as the word 'Αράπης' [Arab] which I find offensive. (Participant 12).

Some of the students admitted that they can still observe some bullying, discrimination or negative attitudes, which depend on socio-economic factors and L1 origin:

No, because still there are people from my country of residence who bully and discriminate against people from other countries. (Participant 29).

They tell people that speak other languages to go back to their own countries. (Participant 30).

Cypriot society is open and tolerant to an extent. The conservative side of Cypriot society tends to be racist towards immigrants, especially towards people with different skin colour than white. On the other hand, Cypriots are rather respectful towards tourists. (Participant 8).

In the case of Cyprus, I think it is better to be familiar with the Cypriot Greek way of life because you integrate with society and get better treatment from various public services. Last week I made a phone call to a public service, and when the employee figured out that I was Greek she started talking in an arrogant way. Clearly the fact that this can happen to one person doesn't mean that it is happening all the time with the Greek people or people of other nationalities in Cyprus. (Participant 21).

English as an international language and lingua franca has an important role in the linguistic repertoires of both majority and minority/immigrant students. English-CG code-switching/mixing is a common phenomenon, especially in the online and offline communication of younger generations of local and minority/majority students.

5. Discussion and conclusion

This study investigated heritage language use, its maintenance and transmission, as well as language identity and social inclusion of second-generation immigrants in Cyprus with various L1 backgrounds. The analysis of the data (questionnaires, interviews, focus group discussions, observations) showed that second-generation immigrants have hybrid language and cultural identity and certain strong perceptions regarding citizenship, inclusion and belonging. They try to assimilate to the target society, but at the same time they have strong ties to their community of residence, with their L1 country, their heritage or home language. The participants also have hybrid language practice as they use mixed/multiple languages at home and elsewhere.

The second-generation immigrants in Cyprus have some similarities and differences regarding their DLC, linguistic behaviour, language attitudes and identities. They differ in terms of their age of onset to Greek, length of residence in Cyprus, language dominance, domains of language use, language proficiency and literacy skills. But they resemble each other in terms of their hybrid linguistic and cultural identity, presence of SMG/CG and English in their DLCs, code-switching, code-mixing and translanguaging.

The second-generation immigrants in Cyprus are exposed to national/majority language(s), but they also speak their immigrant or minority language(s). Greek is the national language in Cyprus. Our participants are second-generation immigrants in Cyprus or minority speakers, and for them Greek is either their second language or an additional language. So, they have certain challenges to overcome in their everyday lives and the mainstream education system. Their access to various languages in their multilingual repertoire is not equal. Not all of them have schooling or can develop literacy skills in their home languages. Thus, there is a question about inclusive and equitable education in multilingual settings as more institutional and policy support is required in the age of globalisation and superdiversity. In the case of Cyprus, students have their home language(s). Living in a bilectal setting, they are exposed to the national language, SMG, and to CG through speech, and then at university they need to use Greek and/or English in their studies. They use their vehicle languages in order to function in the society, for their education, and personal lives. They have different language proficiencies than their L1, L2, L3, Lns and different functions and domains of use.

There are various factors that affect heritage language use, maintenance and transmission as well as language and cultural identity, linguistic repertoires, DLCs and social inclusion of second-generation immigrants in Cyprus with various L1 backgrounds. Minority and immigrant speakers need to adapt to their new society

and to adjust culturally and linguistically [9–11]. Their linguistic and cultural identities are not static and depend on their life trajectories, communication experiences, citizenship and solidarity with members of the minority and the majority communities [8, 12, 13].

The second-generation immigrants and minority speakers undergo the same process of acculturation as their first-generation parents. But it is more difficult for second-generation immigrants to maintain their heritage language and culture without proper L1 input, schooling and literacy skills development and to have a balance between integration, maintenance of cultural heritage and adoption of new cultural traits [17–19]. Home literacy environment, family language policy, social networks and attitudes could be the factors that affect the development of home language and culture or lead to assimilation, relinquishing of cultural heritage and replacement with new cultural traits (and in some cases separation or marginalisation) [20].

Not all of our participants have the same level of L1/heritage language knowledge. However, all of them have the majority language, Greek, and the lingua franca, English, in their linguistic repertoires and DLCs, which help them to function, communicate, study and work in Cypriot society. Overall, they have a positive attitude towards multilingualism and multiculturalism, their heritage language and culture, but their self-esteem can be negatively affected by discrimination against immigrants from the receiving community members [22, 23, 25].

There are individual differences in terms of their linguistic and cultural identities, DLCs linguistic repertoires, acculturation strategies and expectancies, adaptive requirements or acculturative pressures [19, 28–32]. Their language use depends on the domain (private vs. public), age, AoO, LoR in Cyprus, educational and socialization opportunities [33, 34] as well as tolerance towards and acceptance/support of multilingualism and multiculturalism in Cypriot society [35–37].

Linguistic, cultural and social identities are interrelated in the multilingual setting of Cyprus. Most of our participants have hybrid identities, which is reflected in their language use and attitudes [61–63]. Preserving linguistic and cultural diversity of immigrant and minority speakers in Cyprus can enhance cultural diversity, multilingualism and social inclusion in Cyprus and in Europe as a whole, as well as trigger the development of cultural literacy, intercultural dialogue and mutual understanding [7].

This study is the first attempt to investigate the needs, challenges and opportunities regarding heritage language use, maintenance and transmission, cultural and linguistic identities of second-generation immigrants and minority speakers in Cyprus. Further research with more participants of different ages, genders and L1 groups is required for deeper insight into the issues under investigation.

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Chapter 4

Alteration of the Cultural, Religious and Architectural Heritage from Lăpuș Land, in the Context of Climate Change

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Abstract

The architectural heritage is considered the most important category of cultural heritage; therefore, it requires special attention in the current state of climate change. The heritage presented in this chapter includes a total of 26 wooden churches located in Lăpuș Land, framed by UNESCO to the national heritage A and B category. Built on the present grounds or relocated, these are between 200 and 400 years old. Their degradation/alteration has been imminent over the decades due to aging and the socio-political conditions of the times. Alteration is a common notion in relation to the passage of time. The changes in environmental physical parameters, however, raise issues of sustainability of the buildings due to degradation. This paper wants to bring to the readers' attention the importance and vulnerability of murals in wooden churches of Lăpuș County, which are an invaluable treasure, in terms of constructions, objects and traditions that require a civic responsibility for future generations in these difficult geopolitical conditions overlapping climate change.

Keywords: cultural heritage, climate changes, wooden church, degradation

1. Introduction

The northern area of Transylvania is the land of Maramureș, Lăpuș, Chioar and Codrului, where we can find over 100 wooden churches built since the 17th century [1, 2]. **Figure 1** the present chapter approaches a brief narration of the current state, assessed through visual inspection, of 26 wooden churches located in Lăpuș Land, belonging to Lăpuş Archdiocese, the Orthodox Diocese of Maramureş and Satu-Mare, Targu-Lăpuș, Romania. This study will present an interdisciplinary approach to the addressed topic.

These wooden churches, of particular cultural and spiritual richness, are brought to attention in order to highlight their vulnerability in the context of such strong and obvious climate changes that are currently taking place. The wooden architecture represents one of the most magnificent examples of built heritage all over the world [3], of which, an important part is represented by the wooden

Figure 1.
Map County of Lăpuș (from https://teofil-ivanciuc.weebly.com).

churches, often found scattered throughout Eastern and Northern Europe, and Northern Asia.

Built on the present grounds or relocated, their workmanship is established to be between 200 and 400 years old. The majority of those churches still existing today were built between 17th and 19th centuries and are represented by one type of church, namely "Orthodox church", built for the Romanian Orthodox communities [4–7].

2. Climate changes

Environmental impact on the wooden churches in Lăpuș Land is caused by the extreme weather events that have been taking place in the recent years. Climate change is continually increasing the likelihood, magnitude, and frequency of these processes which endanger these hard-to-keep values over the years [8].

The fragile paintings found inside these churches are particularly vulnerable to environmental changes. Structures, which have been standing for hundreds of years, are at risk from extreme wetting, drying, and temperature fluctuation [9].

Among the factors that significantly influence the state of degradation and endanger the future of these architectural and cultural wonders are:

- The rise in temperature, which is already notable. There is a general upward trend in global average temperature since the late nineteenth century; temperatures rose just below 1°C. Although it does not seem to be too much, it must be taken into account that a global increase in the average temperature of 2°C has not existed for over 100,000 years. This increase in temperature, changes the indoor conditions that have existed so far, favoring the appearance of mold and micro bacteria.

- The abundance of rainwater and extreme weather have become commonplace. Anticipated changes in seasonal rainfall patterns suggest that while abundant spring and autumn rainfall may become more frequent, so may drier summers. Extreme weather events are also likely to increase in frequency, with increasing

risks to the historical heritage. Both sudden heavy rainfall and the cumulative impact of less intense but repeated events can be harmful. An example in this sense is the storm of 2017, which the area with extreme force, knocked down the tower of the church in Costeni. This caused a chain reaction, allowing the rain to fall inside the church, and ultimately affecting the entire structure. The restoration of the roof, the tower, and of the whole church is still in progress and requires substantial financial aid and human resources to minimize the preservation needs of the church.

- Biogeography is a topic that should not be neglected at all, because the new distribution of animals, the abundance of growing vegetation in the gardens where wooden churches are located, and the rising of pathogens, endangers the indoor and immovable heritage.

Understanding climate change's impact on heritage in Lăpuș Land requires the identification of risks. We mention some of them: inadequate or insufficient information or experience preventing appropriate actions, damage to or loss of heritage assets, harm to heritage assets from maladaptation, damage to reputation from maladjustment, inconsistent responses or failure to respond to climate change-related impacts, geological and pedological changes causing damage to wooden churches structures, harm to heritage structures from frost fracture or harm to heritage assets from wildfire.

The consequences and scale of climate change are daunting. Although unpredictable and severe weather in the form of floods and storms is likely to be an ongoing problem, continuous change will come more regularly from less severe, yet cumulatively significant, individual impacts.

Climate change is a risk factor. It exacerbates less significant threats, creating new and unforeseen challenges. Ways to prevent significant losses are mitigation and adaptation.

Heritage is not only affected by the impact of climate change, but also by our responses to it.

3. Degradation/alteration/conservation/restauration

It is difficult to say exactly when an art object enters an alteration process. All of a sudden we notice cracks and fissures that weren't there before, small pieces that come off, fine dust that spreads around, and in the case of paintings there are gaps in the design and color. It is the imperative moment when the conservation problem arises, knowing the vulnerability of heritage objects in the fight against time and aging. The environment plays a major role in the alteration process. The main factors that influence the movable and immovable cultural heritage capital are biodeterioration, temperature and humidity conditions, natural and anthropogenic pollution [10].

New restoration techniques and studies for the improvement and conservation are constantly appearing, such as magnetic or new resonance techniques or even irradiation treatments of heritage wooden objects with different radioactive sources, particularly in the case of oil painting. These methods, however, cannot always be applied in the field [11–13].

In this case, heritage risk studies are a welcoming site, as an alarm signal, before the moment of alteration, in order to bring the issue to the attention of all stakeholders in due time for mitigations to be effectively executed.

According to specialized studies, the implementation and analysis of a typical diagnostic study and structural analysis are necessary to assess the main risks affecting the property in order to result in risk indicators [14, 15].

The group of factors that participate in the degradation process and can be considered as major or minor risks for construction materials and structures, is complex and includes visual documentation of disintegration, main forms/types of disintegration, disintegration mechanisms, and intrinsic and extrinsic factors of degradation [16].

For example, the protocol of decay investigation include visual observations of the building material's state of conservation, typology of deterioration phenomena, decay mechanisms, decay intrinsic factors, and decay extrinsic factors.

In the frame of the present project, we intend to further study the extrinsic decay factors, such as structure general data, climate data, atmospheric conditions, indoor environment, biological factors, accidental actions, human impact, condition of usage, socioeconomic parameters or geotechnical frame of foundation [17].

Alteration is a common notion in relation to the passage of time. According to dictionary definition, alteration means transformation or change in the negative, involving a chemical change in the material, in the case of pigment murals, while damage involves only physical phenomena [18–20].

Degradation, a commonly used term in contemporary theory, refers to a state of actuality of the object.

Literature suggests that if the degradation occurs unintentionally, but in a positive manner, the effect is known called "patina" (involving the chemical transformation of organic or inorganic materials in the work). Over time patina has acquired a status in the aesthetic qualification of an object [18]. On the other hand, if the degradation occurs unintentionally, but in a negative manner, then we are talking about degradation [21].

From this moment, the conservation-restoration stage appears, which represents the entire action of saving a work of art from the past.

The field of restoration in Romania operates on the basis of the legislation issued in 1974, which was subsequently established by the Norms of 1982, 1993, and 2003. Following these legislative directives, the meaning of the terms Conservation and Restoration implies two distinct actions. The first involves only a preventive action on the object while the latter offers the possibility to exercise a proper curative preservation [22].

The way that conservation is carried out has suffered many changes throughout the last 50 years. There have been numerous developments in methods to measure and control environments and ways to protect objects on display and in transit [23]. But in the end, it all comes down to time and costs.

The proportion of time and effort dedicated to interventive conservation in heritage institutions appears to be decreasing. Arguments based on cost efficiency and risk reduction are sometimes employed as justification. Arguably, the situation is not straightforward and the ethical and economic arguments for doing less intervention are not always consistent or convincing [23]. Nevertheless, the degradation/alteration has been imminent over the decades due to the socio-political conditions of the times.

The conservation-restoration of some churches to be presented hereafter has been done over many years with various funding and with numerous volunteering hours from the communities, under the careful guidance of local priests. "Patina" can be observed in just a few churches. Others were left behind for socio-administrative reasons. Their importance remains the same over the centuries whether or not the villages remain sufficiently populated. Their protection is an absolutely necessary and justified act, not only from the perspective of the object as a material

value in open space but from the importance of cultural value that speaks of a Romanian nation who made efforts to keep to this geographical area, regardless of the historical context and who are now facing globalization and climate change.

Obtaining funds for conservation restoration remains a sensitive and open topic.

4. The wooden churches

The wooden Orthodox churches from Lăpuș Land are an example of remarkable heritage with similar architectural features and interior paintings from the same time frame and region. Their overall beauty, the language of interior ornaments, and paintings once again confirm the invaluable value of national and universal heritage, early messages of anonymous peasant artists. We find a vivid portrait of this area through the diversity of paintings, wooden decorations, and craftsmanship expressed in these medium-sized wooden buildings, equipped with a narrow bell tower erected as high as possible and protected with shingled roofs. This is a vernacular expression specific to the cultural landscape of this mountainous region of northern Romania [24].

Most churches are located on high hills, in gardens with trees, having a cemetery around them or in their close vicinity. They are medium-sized construction spanning between 20 m long and 5 m wide. Their roof is covered with *draniță*, a wooden shingle specially made by local craftsmen. The heights of the towers differ from church to church. The overall assessment of the buildings was made directly, through visual inspection on site, and indirectly, by consulting local chronicles and other sources or discussions with villagers and museum supervisors. A significant input in identifying the structural and decorative elements was Pamfil Bilțiu's book "*Wooden churches in Lăpuș Land*" [25].

The wooden churches addressed in this chapter have been classified as heritage monuments category: Unesco, A, or B [26].

5. UNESCO heritage

5.1 The wooden church of "Saints Archangels Michael and Gabriel" from Rogoz

Historically dated to the 17th century (1663)

Official registration: **UNESCO**

Rogoz village, lying on a bright plateau of the land of Lăpuș, attracts attention through its uncontested cultural richness.

Set in a small garden, in the middle of a cemetery, the church of *"Saints Archangels Michael and Gabriel"* from Rogoz was built in 1663, according to the inscription engraved on the front door. The church was built shortly after the old church was set on fire by the Tatars in 1661, fact also indicated by the inscription on the front door. The imposing tower is estimated to have been erected during the restoration works that took place in 1785. The most recent restoration took place in 1961 and was conducted by the Romanian Directorate of Historical Monuments. This church is the most representative of the Lăpuș Land, being registered in the Unesco patrimony. Here we come across elements from the Western Gothic, the traditional Romanian Orthodoxy, and the pre-Christian roots of Maramures. The church is built of massive elmwood beams, closed at right angles and reinforced in places with thick wooden dowels.

According to the Cyrillic inscriptions kept on the altar, the church was painted in 1785, *"In 1785 this holy church was painted during the life of the High Emperor*

Joseph II ...". The painting works began in 1717: *"Since 1717, the painters being Munteanu Radu from Ungureni and Man Niculae from Poiana Porcului"* (inscription in the nave, on the northern wall) and were finalized in 1785: *"It was in 1785, on June 10 we started to paint this holy church and it is September 11 that the painting was completed "* (inscription in the nave, on the southern wall), the painters being Radu Munteanu from Ungureni (neighboring village of Rogoz) and Niculae Man from Poiana Porcului.

Currently, some scenes are fragmented while others are entirely erased. The painting includes scenes from the Old and the New Testament. In the narthex, the dominant theme is that of the *Last Judgment*, where, hordes of pagans condemned to Hell are represented by figures dressed in Western clothes similar to those painted by Radu Munteanu in the wooden church in Deseşti (**Figure 2**) [24].

The painting has been restored and it is currently in a good state of preservation. Here we can talk about the patina of painting indeed. The fact that the church has received a superior classification, and the attention paid to careful care, lead to long-term preservation.

5.2 Heritage A

5.2.1 The wooden church of "Saints Apostles Peter and Paul" from Poiana Botizii

Historically dated to the 19th century

Official registration Cod LMI: MM-II-m-A-04515

Local sources relate that, in the northernmost village of Lăpuş Land, in the village of Poiana Botizii, at the foot of the mountains, in 1809 the construction of a new wooden church began on the old existing place, on the same spot where the old church was cremated. In 1819, when the building works were completed, the sanctuary was consecrated, receiving the patron saint of *"Saints Apostles Peter and Paul".* In 1906 began the painting works on the interior walls, were entirely funded by the local community. The new church, however, proved to be too small, which is why in 1920 an addition-extension was built. Subsequently, consolidation works

Figure 2.
Indoor painting – wooden church of "Saints Archangels Michael and Gabriel" from Rogoz.

took place. In 1974, a period of major modernization in that area, electric lights were introduced, which continue to function until today (**Figure 3**).

Located on top of a hill overlooking the village, surrounded by the cemetery, the church is an imposing presence, with a length of about 17 m and a width of about 5 m. It is built of oak wood, following a ship-type plan, with beams joined in a dovetail. The wooden soles are placed on stone vaults, which form a solid foundation. The upper beams, by extension, form consoles, on which a hipped roof is placed, covered with *draniță*. Through the additional extension – the awning that was intended as a place of entry – will become a narthex. This greatly increases the nave while the altar remains at its original dimensions. Above the nave, in the middle of the roof, rises the tower formed by a single plank section. Currently, the church is in good condition, but if no measures are taken, the wood caries will start working because winters with high frosts have been replaced with mild winters, without snow, which led to the formation of cavities in certain parts of the building material.

5.2.2 The wooden church of "Saints Archangels Michael and Gabriel" from Stoiceni

Historically dated to the 18th–19th century
Official registration Cod LMI: MM-II-m-A-04754

The exact date of construction of this church remains uncertain. There are some sources declaring its construction around 1860 while other sources send us far behind, in the eighteenth century. This church is built on top of a hill, from where one can see the Stoiceni village. Local sources and tradition tell us that it was built on the site of a previous church (it is unknown why it was replaced), but the initial *Holy Mass* was preserved. It follows the planimetry used at that time and in that geographical area, namely porch, narthex, nave, and polygonal altar. The entrance portal has a massive frame. The narthex is separated from the nave by a wooden wall with two openings with cut arches. The portal of the passage door is painted with floral motifs. In the nave, we find an inscription with Latin spelling that dates back to 1872, when the interior painting was executed. Saints and Martyrs are

Figure 3.
Indoor painting – wooden church of "Saints Apostles Peter and Paul" from Poiana Botizii.

painted in the narthex, according to tradition, and the scenes of *The seven-headed dragon* and *Death with Adam's head and shins*. On the walls of the nave, we find biblical faces and scenes: *Adam and Eva in Heaven*, scenes from the Passions (**Figure 4**). The half vault and the vault are painted with faces: *Saint Mary*, *Saint Alexander*, *Saint John*, and the *Evangelists* (**Figure 5**).

The hierarchs and *The Last Supper* are depicted on the altar.

The interior painting is in very good condition, taking into account the normal aging. Perhaps one reason for this good preservation would be the fact that the

Figure 4.
Adam and Eva in the garden of haven – wooden church of "Saints Archangels Michael and Gabriel" from Stoiceni.

Figure 5.
Half-vault painting – wooden church of "Saints Archangels Michael and Gabriel" from Stoiceni.

roof is covered with galvanized metal sheets, which led to better protection of the interior environment. One other hypothesis would be the geographical location. The bell tower rises above the roof. Unlike the body of the church, the tower is covered with *draniță*. If the roof would be rebuilt to include the original roofing stile (*draniță)*, perhaps it might have a chance of a superior heritage framing.

Outside the church, the Mass of the Elders is still preserved.

5.2.3 The wooden church of "Saints Archangels Michael and Gabriel" from Ungureni

Historically dated to the 18th century

Official registration Cod LMI: MM-II-m-A-04788

"*When it was vlet from Christ 1782 made this church the ununited*" is engraved inside the church, above the entrance door leading to the narthex. It is a medium-sized church, also placed on a hill, in the center of a village spread over a considerably large area. The planimetry is the most common, with a narthex, nave, altar, and an entrance located on the western side of the narthex. It is built of massive ash wood beams. The beams at the top form consoles with rich ornamentation at the ends. The narthex is ceilinged (it has a built-in ceiling) and the nave and narthex have a semi-cylindrical vault. The interior of the church has been painted in its entirety. There are no historical data regarding the master painter, who remains unknown until today. The church is altogether well preserved, even if the painting is quite altered, to the point of being entirely erased in many places. Its state of conservation is mostly due to its maintenance and attentive care paid by the local community (**Figure 6**).

5.2.4 The wooden church of "Saints Archangels Michael and Gabriel" from Vima Mică

Historically dated to the 18th century

Official registration Cod LMI: MM-II-m-A-04795

The architectural peculiarities of this church place its foundation in the second part of the 18th century. It is located on a beautiful plateau inside the village of

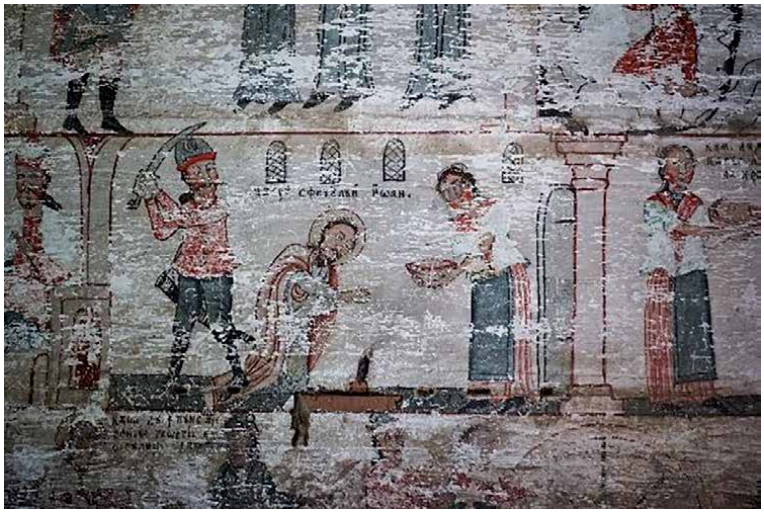

Figure 6.
The beheading of St. John the Baptist – wooden church of "Saints Archangels Michael and Gabriel" from Ungureni.

Vima Mică. The *Cross of Jerusalem* is carved around the entrance door to greet the parishioners. Inside, we can read the inscription from 1854 with the announcement that the roof was "shingled". It consists of narthex, nave, and altar. The bell tower has a frustoconical helmet that ends at the top with a cross with three arms and a crescent. The roof has two more small towers. The painting inside is of extraordinary beauty, in light blue tones, which gives it a unique value. In 1902 an unknown painter partially restored the painting (according to local sources). At the entrance to the narthex, we are greeted by the *Tree of Life* and an old chest above which is painted a scene that urges you to reflect: *Jacob's dream* (**Figure 7**).

The door is also decorated in a special style. The scenes from Passion on the western wall are very well preserved compared to the opposite wall and vault where the painting shows signs of deterioration. When passing between the nave and the narthex, the walls at the joint is in a severe degradation state, which gradually led to the alteration of the painting. The intact painted scenes appear clearly and have a high chance to be saved for perpetuity (**Figure 8**). There is a file pending for the rehabilitation of the church. The wooden structure and the roof are to be rebuilt and consolidated.

Figure 7.
Jacob's dream – wooden church of "Saints Archangels Michael and Gabriel" from Vima Mică.

Figure 8.
Myrrh-bearing women – wooden church of "Saints Archangels Michael and Gabriel" from Vima Mică.

5.2.5 The wooden church of "Saints Archangels Michael and Gabriel" from Răzoare

Historically dated to the 18th century
Official registration Cod LMI: MM-II-m-A-04610

The church is located at the base of a hill, with the northern wing very close to the slope with vegetation. Several sources and hypotheses place its foundation before 1730. Other sources speak of the initial construction somewhere on the bank of the Lăpuș river, in 1759 being relocated to its current location. Writings found indoors mention this year as the year the interior walls were painted. The church has a porch from where we enter the narthex, nave, and altar. The porch is supported on three pillars attached to the crown. The most important exterior decoration of the church is represented by the geometric motifs found on the porch structure. The entrance door to the church has an ingeniously worked wooden lock. The roof has a bell tower, which has a gazebo over which is placed the roof with a square base, rounded to the top, flanked by four turrets with a gazebo, and simple crosses finished with crescents. The wooden interior proves the mastery of the craftsman who remains unknown.

The painter *"Petre Diul (Deacon, n.n.) from Preluca",* signed the royal doors in 1759, which is why the interior painting is also attributed to him. Unfortunately, the state of advanced degradation of the painting does not give us an optimistic image of the future of this church. The careful care of the caretakers will not solve the severe degradation state that affects the wooden structure, with serious damage to the altar, while the hardly visible painting left has a great chance to be lost under the patina of time.

The entrance to the underground galleries of a non-ferrous mine use to be at a very short distance from the church. We hypothesize that the long years of mining exploitation, with heavy traffic and underground works, weakened the wooden structure of the church, which implicitly led to the deterioration of the indoor painting (**Figure 9**).

5.2.6 The wooden church of "Saints Archangels Michael and Gabriel" from Libotin

Historically dated to the 18th century
Official registration Cod LMI: MM-II-m-A-04596;

Entering through a wooden gate specific to this northern part of the country, we encounter the wooden church located in a beautiful garden that also serves as a cemetery. A fading inscription on the door places it back to 1671. There are local sources that speak of it having been built in 1761, but others show that it was erected in 1811. However the case, the villagers support the story passed down from generation to generation that it was brought to Libotin from Remetea Chioarului. This seems to be a very plausible scenario, the transshipment of an old construction being a normal habit in those times. This scenario would also be supported by the fact that it is a small, ship-shaped structure, made of elmwood. The roof is covered with *draniță,* feature that we find to be a symbol of the area. The entrance is made through a door enclosed in a wide frame carved with crosses. The roof rests on short beams, decorated on the outside by rounding. The entrance is made through the south side.

The bell tower, located above the narthex, has a square shape, with a gallery and a planked railing, with the lower ends of the planks decorated with heart motifs, a symbol of eternal love. The tower has a pyramidal steeple, which ends with a simple metal cross resting on an onion-shaped bulb. The frame of the entrance portal to the narthex is decorated with the trefoiled cross motif, repeated on the vertical pillars of the door.

Figure 9.
Indoor painting – Iconostas – wooden church of "Saints **Archangels** *Michael and Gabriel" from Răzoare.*

The interior walls of the church preserve the old painting that presents biblical scenes. The semi-cylindrical vault of the apse and the ceiling of the narthex have been restored, and the semi-cylindrical vault of the nave presenting a restored representation of the first chapters of *Genesis* and the *Ascension of Elijah* (**Figure 10).** This church had the benefit of having its painting restored. Amongst its painting, we can find a unique representation of *Saint Christopher*, that few people are aware of **Figure 11**.

5.2.7 The wooden church of "Saint Dimitrie" from Larga

Historically dated to the 19th century
Official registration Cod LMI:: MM-II-m-A-04594;

The wooden church from Larga village is located on a hill surrounded by the old cemetery, with a wide glade at its base. Probably hence came the name of the village (Larga – tr. wide). Above the entrance one can see the following Cyrillic inscription from 1802: *"The village priest with his wife Paladie today 1802 in the days of the exalted emperor Francis I* (Francis II 1792-1806, Francis I of Austria, 1804-1835, n.n.)*... when I made it ... "*. It was, however, consecrated only in 1816. Similar to previously described wooden churches, it has the entrance on the south side of the narthex, then the nave and altar. The hipped roof is also covered with *draniță*. The bell tower has a gazebo and a balcony, and the helmet has pentagonal eaves. The frame of the entrance door to the church is entirely covered with decorative patterns. Although the painting is damaged, one can still see its beauty and value in areas that have escaped the weathering. In the narthex, one can find the Cyrillic inscription attesting that it was painted by Gheorghe Opriș. On the western wall of the narthex, there is a painting of the *Wheel of Life*, guarded by the Sun and the

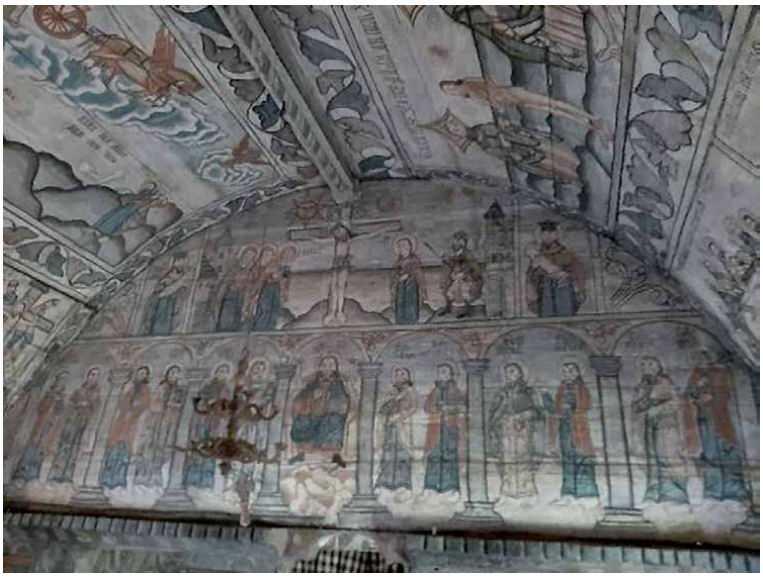

Figure 10.
Indoor painting – Libotin's wooden church of "Saints Archangels Michael and Gabriel".

Figure 11.
Saint Hristofor – wooden church of "Saints Archangels Michael and Gabriel " from Libotin.

Moon, while on the eastern wall is represented the *Last Judgment* and the cycle of the *Wise Virgins* and the *Mad Virgins* (**Figure 12**).

The northern wall of the nave is painted with saints in vaulted frames and scenes from the New Testament and the Passion. The iconostasis is in an advanced state of degradation, yet the faces of *St. Anthony* and *St. Euthymius* can still be identified. The altar preserved some scenes and figures of saints but equally degraded. The face of a Saint with a cross stands out on the southern wall, through the altered painting (**Figure 13**).

Figure 12.
The wheel of life – wooden church of "Saint Dimitrie" from Larga.

Figure 13.
Saint on the wall – the wooden church of "Saint Dimitrie" from Larga.

5.2.8 The wooden church of "Saints Archangels Michael and Gabriel" from Inău

Historically dated to the 17th century
Official registration Cod MM-II-m-A-04589;

The wooden church from Inău village is located on a hill with a slight slope, between the hills that form the village. Some sources say that it was originally built in 1689 in Baia-Mare, from where it was bought by the villagers from Rus, and later moved to Inău. Other sources indicate the year 1778 as its foundation. It is a beautiful, robust construction including a porch, narthex, nave, and altar. The roof covered in *draniță* was completely rebuilt in 1940. The bell tower has a square base and a gallery, the helmet being largely extended and flanked by four turrets. The entrance door is made of two pieces, carved with honeycomb and rosette motifs in the background. At the junction of the two parts that make up the door, is carved a cross. At each part of the cross is written the name of the four Evangelists: *Mark, Luke, Matthew,* and *Joan*. The door portal surrounding the main door is decorated with broken lines, fir branches, honeycombs, the cross with two horizontal arms, semicircles, rosettes, and the tulip stem.

During the years of modernization, electricity was introduced, and the old wooden chandelier was now equipped with electric lights. Scenes such as *Heaven*, *Jesus Surrounded by the Apostles,* and scenes from the *Passion of Jesus* can hardly be identified in the narthex. The half-vault and vault of the nave represent evangelists and scenes such as *Holy Trinity*, *God surrounded by trumpeting angels*. Unfortunately, the painting has not been very well preserved, being almost entirely erased, and current environmental factors will not help to preserve it for the future (**Figure 14**).

Figure 14.
Narthex painting – wooden church of "Saint Archangels Michael and Gabriel " from Inău.

5.2.9 The wooden church of "Saints Archangels Michael and Gabriel" from Drăghia

Historically dated to the 18th century
Official registration Cod MM-II-m-A-04569;

The church was built in 1706 on a hill, surrounded by the cemetery, as it was the local custom. The ground it was built on belonged to the local Radu family. It had the opportunity to be rehabilitated as a structure (see chapter "*Cultural heritage of a three centuries-old wooden church*", Heritage Intech Open 2020). The entrance is through a massive wooden door located on the south side, that preserves the old wooden locking system with a two-piece metal key (see chapter "*The movable heritage*", Heritage New Paradigm 2021). It was built of solid oak beams, with the soles placed on a stone foundation. On one of the oak beams, to the left of the front door, is written the year of construction of the church: *"Anno 1706 D. 14 obrys"* (Year of the Lord 1706, October 14). On the royal doors is written the year it was painted: *"1797 This pomade was paid by Toma Opriș and his wife Marie and their sons Philip, Stephen and his sister Theodora Anisia. I painted Petre"*. It was executed by Petre Diacul from Preluca, but the weathering left serious marks on it. In the narthex, we find images of *Wise Virgins* and the *Mad Virgins*, *Myrrh-bearing Women*, and other biblical scenes. The Angel looks down at you from the painted ceiling (**Figure 15**). The door to the nave is painted (see the chapter "*A survey of physical parameters and natural radioactivity in the wooden church of "Archangels Michael and Gabriel" Drăghia*", Heritage Intech Open 2020). On the inner wall of the iconostasis is the well-preserved figure of the High Priest Melchizedek (**Figure 16**).

Unfortunately, the inside painting is in an advanced state of degradation, despite all the maintenance efforts [26].

5.2.10 The wooden church "Saints Archangels Michael and Gabriel" from Dobric

Historically dated to the 18th century
Official registration Cod MM-II-m-A-04568;

The church is known by the locals as *The church on the hill,* for two reasons. Firstly, for the obvious reasons, it has been built on top of a hill, with a large cemetery around it. Secondly, because there is another wooden church in the same

Figure 15.
Angel – wooden church of "Saints Archangels Michael and Gabriel" from Drăghia.

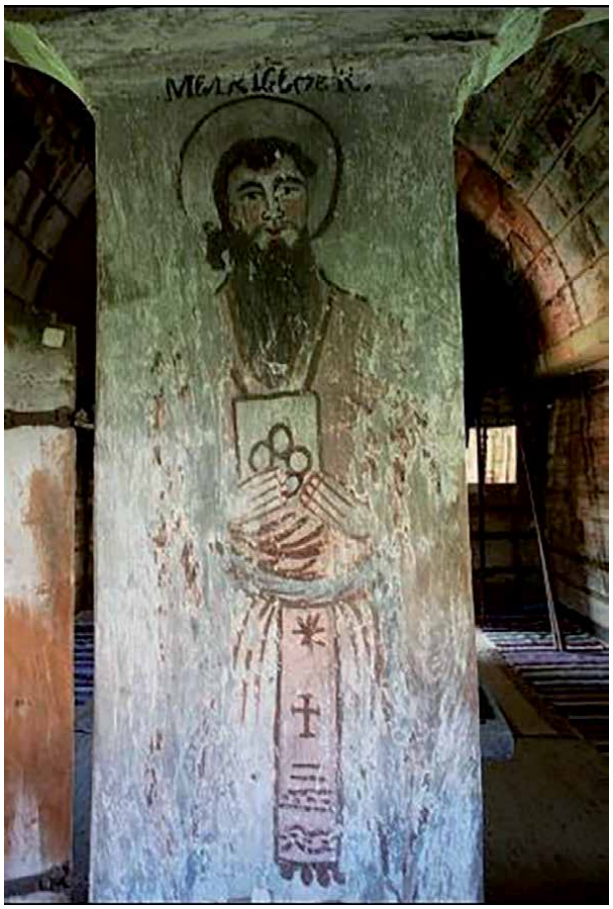

Figure 16.
High Priest Melchizedek-wooden church of "Saints Archangels Michael and Gabriel" from Drăghia.

village, but in the valley. Limited information is available about de historical dating, just that is was sometime around the 18th century, maybe sooner.

It is a medium-sized construction, built of oak beams on a stone foundation. The entrance, without a porch, is made through the southern part directly in the narthex followed by the nave and the altar. A beautiful strip, with the rope of life carved in wood, surrounds the church. In 1930, the shingle roof was rebuilt with a *draniță,* covering an extension of the *Table of the Elders*. The church tower is covered with tin sheets. Indoor we can find a beautiful painting, relatively well preserved, with the framed faces of male and female Saints (**Figure 17**).

Entire scenes are preserved in both the narthex and the nave, such as the *Wheel of Life* and scenes inspired by Revelation (Apocalypse). The vault and the joint areas suffered bad weathering. The chances of conservation for this church remain uncertain (**Figure 18**).

5.2.11 The wooden church of "Saint Elijah the prophet" from Cupșeni

Historically dated to the 18th century

Official registration Cod LMI: MM-II-m-A-04562

The church, located like the others on a hill belonging to the village, has an uncertain historical date. Official data acknowledge it has existed since 1733. On the altar, we find a partially erased inscription announcing the historical dating of the painting:

Figure 17.
Saint Paraskeva – wooden church of "Saints Archangels Michael and Gabriel" from Dobric.

Figure 18.
The wheel of life and the Revelation (Apocalypse) – wooden church of "Saints Archangels Michael and Gabriel" from Dobric.

"This saint... too the high emperor... Francis first bishop... being... and prot... the ununited place John... 1823." It is of medium-small dimensions, with a porch, narthex, nave, and altar. It stands out through the staircase that goes up to the tower, its steps being hollowed out in a single tree trunk. It is covered with wooden shingles, and the bell tower is massive and square-shaped. The interior painting in the narthex is almost completely destroyed, half of the ceiling and a wall has been rebuilt. In the altar, the

Figure 19.
Iconostasis – wooden church of "Saint Elijah the prophet" from Cupșeni.

painting is likewise compromised. The paintings of the apostles on the iconostasis are hardly preserved, showing an increasingly pale coloristic over time (**Figure 19**).

5.3 Heritage B

A number of 14 wooden churches (**Table 1**) spread throughout the same geographical area also bring their heritage contribution. Presently there are only classified as being of local interest. The future might bring the chance, for some of them, to be ranked higher. Similar to those in heritage category A, they are built of

Nr.	Name of the church	Location	Historically dated	Official registration COD
1	Saints Archangels Michael and Gabriel	Boiereni	18th century	LMI: MM-II-m-B-04526
2	Saint Nicholas	Costeni	19th century	LMI: MM-II-m-B-04554
3	Saints Apostles Peter and Paul	Costeni	19th century	LMI: MM-II-m-B-04555
4	Saints Archangels Michael and Gabriel	Cufoaia	19h century	LMI MM-II-m-B-04560
5	Saints Archangels Michael and Gabriel	Cupșeni	18th century	LMI MM-II-m-B-04563
6	Entrance in the Church	Dobric	18th century	LMI: MM-II-m-B-04567
7	Saints Archangels Michael and Gabriel	Dumbrava	18th century	LMI MM-II-m-B-04571
8	Saint Mary	Fântânele	18th century	LMI MM-II-m-B-04573
9	Saints Apostles Peter and Paul	Groape	19th century	LMI: MM-II-m-B-04582
10	Saint Paraskeva	Izvoarele	20th century	LMI MM-II-m-B-04591
11	Saints Archangels Michael and Gabriel	Jugăstreni	19th century	LMI MM-II-m-B-04593
12	Saints Archangels Michael and Gabriel	Peteritea	18th century	LMI MM-II-m-B-04602
13	Saint Dimitrie	Răzoare	18th century	LMI MM-II-m-B-04611
14	The born of Saint Mary	Vălenii Lăpușului	18th century	LMI MM-II-m-B-04792

Table 1.
With wooden churches Heritage B from Lăpuș Land.

Figure 20.
Inside painting – wooden church "Saints Archangels Michael and Gabriel" from Jugăstreni.

wood, keeping the same typical architecture. The date of construction is between the 18th and 20th centuries. They are located on plateaus or hills of the villages from Lăpușului Land. Being later put to use, they receive electricity and plastered indoor walls, which has led to better preservation over time. Some of them were painted on the inside plastered walls or on the wooden vaults, keeping with the spiritual charm of the area. An eloquent example is the painting, with a beautiful patina, from the wooden church of "Saints Archangels Michael and Gabriel" from Jugăstreni (**Figure 20**).

At the same time, they had been fortunate with tin roofs. Many of them are still used as churches of worship, on Sundays and religious holidays over the year. This is also the reason why they have been equipped with heating systems by the parishes (**Table 1**).

6. Conclusion

The wooden churches of Maramureș are perhaps the most significant visual symbol of the area. Considering that they have been around for several hundred years in these conditions, we can say that they did their job and played their role quite well.

However, their further survival depends on a few essential factors. Given that wood itself is not a weatherproof material par excellence and undergoes a natural process of degradation, it requires continuous specialized care and restoration, done with maximum awareness and knowledge of the work process. This process must involve substantial funds dedicated to these operations. Today's changing climatic conditions add up to our call for attention to the need for restoration work. Climatic conditions have been demonstrated to affect the art inside religious buildings, with painting suffering the most. Of course, we consider not only the

perishability of wood as a material but also other factors that affect the structure of these constructions, such as displacement and changes in soil structure.

Perhaps the most important step for the preservation and further existence of this heritage of inestimable value must lead us beyond the actual preservation, which of course is essential and should be the starting point. Most of all, an educational campaign to make people aware of the spiritual and aesthetic value of this heritage in everyday life is absolutely necessary. Special attention should be paid to the learning and dissemination of this very special craft. If the craft of woodwork were still desirable and learned by young people in educational institutions if churches would continue to be built respecting the proportions and simple materials if the church painting would be executed in line with the values of simplicity and humiliation of the Maramures peasant and especially if the religious courts, Orthodox dioceses, would order works in this style, tradition, and heritage would not represent only an elitist concern or of those that are part of a museum context but would return to the circuit of everyday life. We must learn today how to build this type of edifice that represents our spiritual essence.

Acknowledgements

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Chapter 5

The Impact Study of the Exchanges between the Microorganism Communities on the Surfaces from Constanta Roman Mosaic and Anthropic Interactions

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Abstract

The constituent elements of the Roman Mosaic from Constanta are damaged under the activities of microorganisms present both on surfaces and in the airborne microbes. The predominance of microorganisms on the different surfaces of the edifice has led to multiple damage such as discoloration, pigmentation, wall degradation and exposed ceramic objects. Through this study we aimed to invest the diversity of microorganisms on the various substrates and levels as well as microclimate conditions. From the samples collected there were isolated and identified microorganisms, many of them with pathogenicity risks for staff and visitors. Thus, for the improvement of the surrounding conditions of the Roman Mosaic exhibition room, the need for management is aimed at reducing the microbial contaminations, based on understanding the changing conditions in the microclimate and decreasing the damage biofilm. Our study can be seen in a broader procedural in the current COVID-19 pandemic conditions.

Keywords: Roman Mosaic, microbial contaminations, antropic, COVID-19 pandemic conditions

1. Introduction

The Roman mosaic building is an ancient construction located in the old town of the Peninsular area of Constanta, Tomis in antiquity, port on the Black Sea called in antiquity Pontus Euxinus. It was discovered after the works made for the construction of some blocks of flats in the autumn of 1959. The archeological campaigns dedicated to the Romanian edifice extended over five years, until 1965. To these were added those from 1965 to 1968, which aimed to conduct further research on construction [1–3].

The archeological complex arranged along the cliff, on the four terraces, has remained almost unchanged since its opening, but it is too little used and appreciated today in relation to its real cultural value.

The archeological importance of the Mosaic meant that in the period 1970–1976 a steel, concrete and glass structure was built above the monument, in the area of the original mosaic, for protection.

The imposing construction, erected in the 3rd or 4th century e.n. (possibly under the emperor Constantine the Great, 306–337), it took place in antiquity on three terraces, cut in the slope of the cliff and leveled to ensure the stability of the construction. It was located right on the quays of the old Tomitan port, from which opened its first suite of rooms. It included eleven vaulted chambers used as warehouses for cargo brought by merchant ships calling at the port.

The configuration of the third level is totally different from the other two. Here we are dealing with a huge hall (101 m long, 21.45 m wide), non-compartmentalized and sumptuous, with over 2,000 m^2 of polychrome mosaic. Its decoration is luxurious, and the improvised tribune on its north-eastern side shows that it had a destination that served the commercial purposes of the port, the place where merchants and transporters met, where business was negotiated, and the prices of products were fixed. In ancient times it was probably covered with a huge vault supported by pillars. Today, part of the long wall and one of the side walls are still preserved from this room.

The first, preserved on a length of 65 m with a maximum height of 5.40 m (it is preserved only at the southern end and gradually descends to the north, to the level of the foundation), has a rhythmic succession of pilasters embedded in it. It seems that there were fifteen such pilasters delimiting fourteen fields. The walls were clad in marble, and the pillars had marble slabs at the top that mimicked the shape and decoration of capitals. Their decorative motifs were predominantly vegetal.

The wall was pierced by an entrance from the current Ovidiu Square, later closed and used as a niche, in which was probably exposed the bust of an emperor (among the sculptural fragments discovered here was the bust of Constantine the Great). Another peculiarity of the room is formed by the few steps that made up the small platform attached to the same wall and also covered with marble. It was probably used as a tribune for the auctions of goods that took place here.

The mosaic carpet stretched across the room.

The floor is therefore kept on a length of 49.80 m and a maximum width of 16.60 m, covering an area of about 800 m^2. The tiles that compose it have variable dimensions, depending on the size and details of the motifs represented. It measures 2–3 cm in the border and 1–2 cm in the central part. The materials used are marble and natural stone of different colors: white, red, bluish-green, black, cream. They are arranged in straight rows, especially in the border and in winding lines for more complex motifs. They are placed on a bed of lime mortar mixed with a lot of crushed brick [2, 3].

These technical characteristics make it possible to classify the work in two of the categories of the typology proposed by several researchers. Thus, from the technical point of view, this mosaic combines the two styles: opus tesselatum (especially the border) and opus vermiculatum (especially the center and the circular, undulating motifs). The carpet has two component parts: the border and the central painting.

The frame has a rectangular shape and a width of 6.20 m. It is composed of several continuous, different strips, which frame and highlight the central representations. These are, in order of their inward succession:

- a rectangular frame delimiting a white band on which stretches a wave of ivy, with the leaves arranged symmetrically, sometimes with the tip up, sometimes

with it down, at equal distances. The spell is red, and the leaves have white, red, and green tiles on the inside;

- the next band contains the motif of the simple rope, symmetrical with another identical rope, together with which it frames a much wider motif, formed by symmetrical intersections of circles; the circles are reddish in color, and their petal-shaped intersection is white; each quadrilateral delimited by intersections in the middle of a circle has in the center a rectangular group of white tiles. The motif is the same used in one of the lodges at Histria;

- after the other rope follows the well-known motif of the Etruscan wave, white, oriented to the left. It is symmetrically arranged with another reddish color and oriented in the opposite direction. Together they frame a band containing the triple braid, which is also called David's knot.

The frame that accompanied the western side of the mosaic, preserved in a proportion of 10%, includes the same motifs, in the same sequence, with one exception: the insertion of "oblique lines that form paleograms".

The central painting consists of an alternation of rectangles and circles inscribed in squares. It seems that there were three such circular fields, but the first two were preserved almost intact [4].

The first circle, the one from the south-west, with a diameter of 7 m, is inscribed in a square with polychrome sides, along which a row of disc halves and one of isosceles triangles (the so-called motif of wolf teeth or saw teeth). Between one of the corners of the square and its corresponding circular arch is a stylized brick, kantharos, with white grooves arranged vertically on its lower half and with S-shaped handles. From it they extend in the two opposite parts, supporting, as it were. This part of the circular border, two ivy twigs. Next to one of the ivy leaves is a white dove, the only zoomorphic representation in the composition [1–4].

The circumference of the circle is adorned by a row of wolf teeth arranged in a mirror with those on the sides of the square frame and by the Etruscan brick wave, oriented to the left. Inside the circle, the simple rope meanders delimiting several geometric medallions, each in turn comprising different motifs: stylized vessels, swastikas, vegetal representations, weapons - double crossed axes and other geometric shapes.

The other preserved circle, to the northwest, is filled with circular scales. Their size decreases at the same time as approaching the center. Apparently, this was the center circle of the carpet. Between the two circles was preserved a rectangle divided by rows of simple rope into several regularly arranged squares. The other dividing rectangle, located in the south, includes a set of various geometric shapes (squares, rhombuses and triangles), which include different motifs: woven rope in four, zig-zags, chessboard, pelta, petals, gamma cross, etc.

In the northwest, the color and stylistic unity of the mosaic is interrupted. The patterns are continued more carelessly, and the colors differ. There are several repairs performed in this part. It is noteworthy, however, that the craftsmen, who reconstituted this degraded part then, chose the most expensive and most difficult method of repairing a mosaic.

The carpet in the Roman mosaic building is loaded with geometric motifs well known in the Roman world and used in most works of art in this category. The simple rope, the Etruscan wave, the wolf's teeth are usually used in the art of mosaic as framing motifs, as decoration for frames or frames surrounding other more important decorative elements. They have a delimiting role and highlight a much more important representation, like the frame of a painting. The whole ensemble

is executed with care, having a unitary composition, formed by various images, combined in a rich and carefully chosen color framework.

Integrated in a monumental architectural ensemble, partially preserved, the Roman Building with Mosaic preserves, perhaps best, the image of the ancient Tomis in a time of economic flourishing (4th - 6th century AD).

Despite the cultural openness and projects that easily fit into the (international) architecture of the moment, the obsessive economic principle has left a deep mark on the architecture of the '60s and' 70s, by transforming projects, in many situations, with the implementation and by deterioration over time, due to the use of poor-quality materials. For this reason, perhaps even more so for reasons related to incompatibilities between the old and the new structure, the exposure of the monument and the creation of an artificial environment for it, the protective construction of the building and the monument itself today show visible damage.

The implications of microorganisms in biodegradation are well known [5, 6] but data on exchanges between microorganisms and eco-physiological principles which relate to the rules of association of microbial communities are limited [7, 8]. Biodegradation is a complex phenomenon so therefore environmental factors, and especially factors that induce a selective growth climate for microorganism, are very important [9–12].

A recent complex study found that the development of fungal communities is conditioned by microclimate factors inside the space, while bacteria vary significantly with a number of behavioral anthropogenic factors (ventilation, type of material used on the floor, number of occupants in the space) [13].

In a few works about the museum indoor spaces were the information on the exchanges and interactions between the communities of microorganisms in the closed environment [14] or the different materials substratum [15].

A recent study [16] shows that the relationship between microorganisms on surfaces and those from the aerosol load requires supplementary studies because there is little information on the matter.

The studies on the interactions between mentioned microorganisms might have an important and promising perspective taking into account human health [17]. It is known that microorganisms in the environment in which humans work have an important role on general health and on the adaptation of the immune response [18].

The present work is a first study in that the surfaces of a building that is several centuries old with evidently degradation have been analyzed. Located inside the covered enclosure, these archeological components are obviously influenced by microorganisms agglomerated on the surface, but also by other source such as the brick side wall, the presence of people who take care of and protect the space, the penetration of air through the vents, etc.

The study aimed to assess the microbial communities from this complex museal space, the degree of the interaction between associations from Roman Mosaic surfaces and airborne microbiota, the persistence in space of pathogens with infection high risk, when the flow of tourists was very limited, in the current COVID-19 pandemic conditions.

2. Materials and methods

2.1 Sampling and macroscopic evaluations

In order to make the diagnosis regarding the biological activity, the surfaces of the pieces from the Roman mosaic were analyzed (**Figure 1**). The biological samples

were collected using a fine scalpel, in sterile Eppendorf tubes or in sterile containers with a volume of 10 mL. The samples were kept at low temperatures of 2–4^0 C until processing.

Areas from the mosaic, as well as from adjacent parts, such as the eastern wall, built of brick and with an obvious biological contamination and degradation, were identified as relevant points for analysis (**Figure 2**).

The autotrophic biofilm was analyzed at this level, arranged in successive layers, portions with intense degradation processes, in the upper area, as well as mineral deposits.

The macroscopic and microscopic observations of the degraded areas were performed.

To identify the biodegradation, sampling for laboratory analysis was performed from the affected portions, (**Figure 3**) but the techniques were minimally invasive, avoiding the production of new colonization points or deterioration.

All, biological analysis was performed in the laboratory by making microscopic observations.

2.2 The microbial contaminations methods assessment

Contact sampling methods have been developed to assess surface contamination collecting by surface 1 cm^2 with sterile moistened swabs touching the surfaces

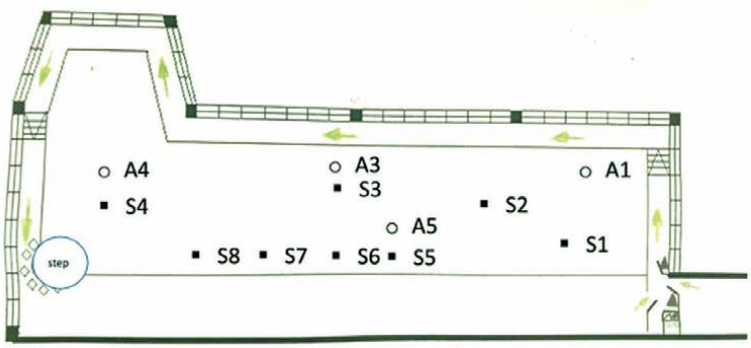

Figure 1.
The Roman mosaic museum samples map and codifications (A1-A4 air contamination, S1-S8 surfaces biocontamination assessment, the green arrow is the route of tourists).

Figure 2.
The details of wall built of brick analyses.

Figure 3.
Appearance of the biological attack on tesserae.

and rapid inoculation on the culture medium. The swab should be pre-moistened with a sterile rinse medium [19]. Also, they were introduced in 1 mL of saline solution after which the inoculation was performed [20].

The growth media used were Columbia blood (isolates pretentious hemolytic bacteria), Tryptic Soy Both (non-selective medium), Sabourad (selective fungi), nutritive agar (non-selective), Mannitol egg Yolk Polymyxin agar, MYP Agar (selective for *Bacillus cereus*).

The identification of microbian species was performed on morphologically criteria (colony characteristics, microscopic on culture smear), biochemical criteria (catalase, oxidase), Biomerieux VITEK microbial identification system.

2.3 Settle plates

Petri dishes with a diameter of 9 cm were used, placed in four points, fifteen minutes exposure, at approximately 1 m from the floor and respectively from the wall or the passage stairs.

Thus, the determination of the presence of microorganisms in the air is made by the method of sedimentation on nutrient/culture media which assumes that after cultivation there is a count of all the colonies developed on the culture medium and thus establishing the total number of microorganisms on the plate and colony forming unit calculated (CFU/cm^2). The Index of Microbial Air Contamination (IMA) was calculated according to [21, 22].

2.4 Microscopical analysis

Small sample fragments were placed in about 5 µL of distilled water, and the cell suspensions were placed on the slide and analyzed under an optical microscope.

The colonization level and the presence of biological particles were monitored under a microscope, the degree of biodegradation was quantified, and the links between the microbiota and the substrate were identified by staining techniques. Rapid staining techniques, methylene blue or acetic acid were applied for staining. Fluorochrome acridine orange (AO) was used to identify morphological details of the microorganisms, with an excitation filter of 488 nm and an emission filter of 515 nm.

3. Results

3.1 Macroscopical and microscopical analysis

Relevant areas for analysis were identified as affected areas of the mosaic (**Figure 4a** and **b**) and adjacent parts, such as the eastern wall, built of brick and with obvious biological contamination and degradation (**Figure 4c** and **d**). The autotrophic biofilm was noticed at this level, arranged in successive layers, parts with intense processes of fungal contamination, in the upper area, as well as mineral deposits.

Microalgae are commonly found on calcareous substrates and can induce degradation by release of acids, accumulation of ions and alteration by pigmentation, fragmentation of the substrate and the formation of crusty, dark or patinated-looking surfaces [23].

Microscopic analysis shows lichen-like structures with an upper cortex formed exclusively by tightly woven and welded hyphae, as well as a gonidial layer with algal symbiosis indicating chlorophyll activity (red coloration) (**Figure 5a**). The middle layer (medullary) consists exclusively of mycelial hyphae, loosely braided (green coloration), (**Figure 5a**).

The biological activity by substrate attachment is very evident (**Figure 5**), as well as the formation of mobile structures, detached from the substrate or colony,

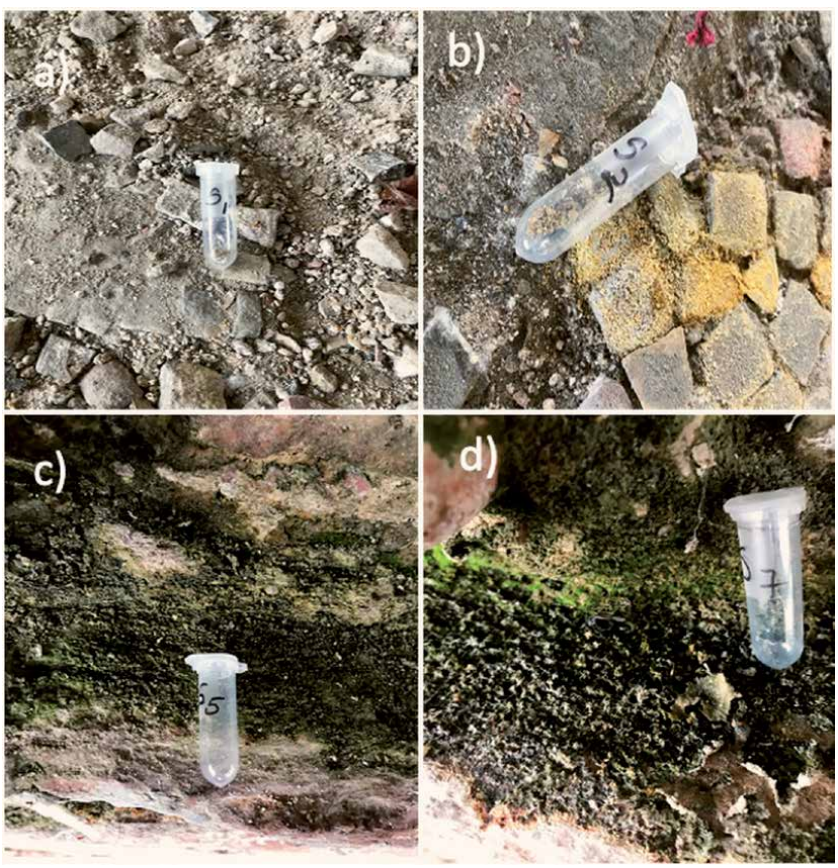

Figure 4.
The affected areas of the mosaic by chromatic alteration and destructions (a, b), the biodegradation of wall surfaces (c, d).

of the goniocyst type, which include photobiont cells surrounded by hyphae arranged in a single layer (**Figure 5c**).

In the S 8 sample (**Figure 6**) intense biological activities were identified, including various colonies of microalgae (**Figure 6d**) as well as fungal activity (**Figure 6a–c**).

The massive microorganisms colonization, highlighted in the samples, explains the various depigmentation, or changes in shades, or the biogenic pigmentation that was identified on the analyzed surface. Bacteria induce changes by discoloration as well as by dissolving various materials generating biodegradation of the substrate through specific metabolism [24].

The crushing of the substrate is noticeable in many samples and can be generated, for the most part, by the impact produced by the bacterial metabolism combined with the chemoheterotrophic metabolism of the fungi [25].

Fungi (hyphae or resistance morphotypes) induce degradation on the substrate by dissolution or the formation of pigmented or discolored areas [26].

The analyzed samples were noted free of hyphae and completely attached to the substrate by obvious interactions. The samples show emission in green by staining with AO which suggests active metabolism.

3.2 Microbiota isolated on nutritive medium

The isolated microorganisms from the museum space, respectively mosaic surfaces, included several forms of which 15 are bacteria (*Bacillus ssp. Aeromonas salmonicida,*

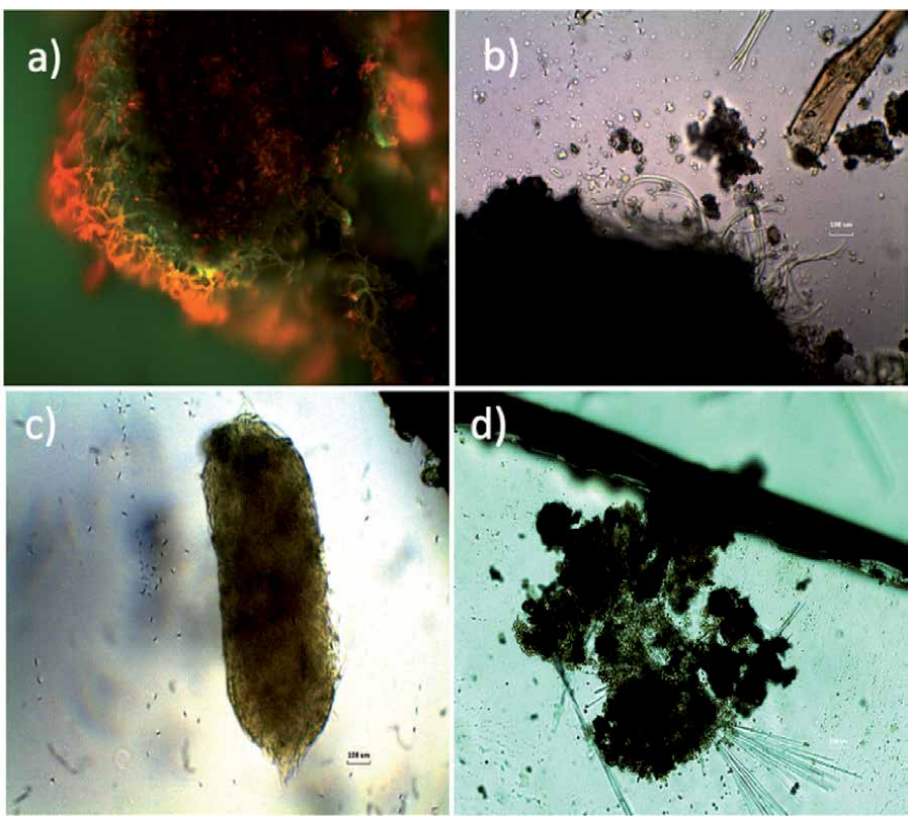

Figure 5.
The microscopical examination of biological samples a) autotrophic forms, in epifluorescence with acridine orange staining, b) biological associations in light microscopy images, c) goniocyst, d) fungal contamination, optical microscopy, bar = 100 μm (x400 magnification).

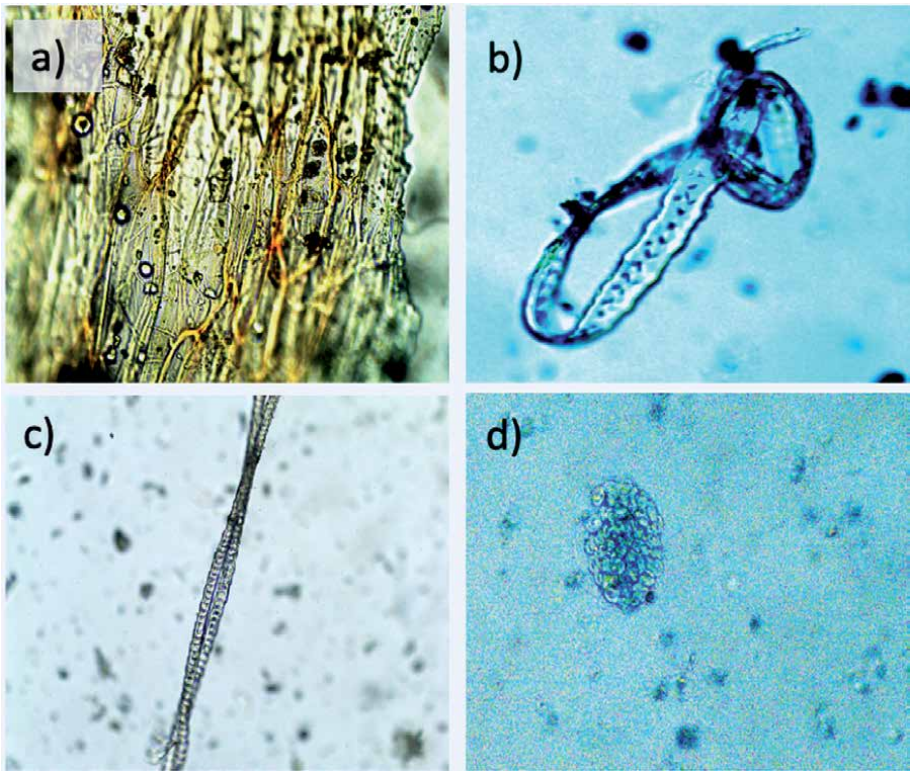

Figure 6.
The microscopic details of fungal morphotypes (a, b, c) and microalgae (d).

Kocuria rosea, Clostridium histolyticum, Corynebacterium urealyticum, Acinetobacter lwoffii, Corynebacterium pseudodiphtericum, Bacillus licheniformis, Bacillus clausii, Staphylococcus epidermis, Micrococcus luteus, Corynebacterium ssp., Pseudomonas ssp.) and 11 fungi (*Aspergillus flavus, Aspergillus niger, Rizopus sp., Penicillium ssp, Candida sp., Alternaria* sp.) and five unidentified species.

Quantitative evaluation of microorganisms highlighted the microorganism load of surfaces near the eastern wall (S 5, S 7) of the analyzed space (**Table 1**) where the number of bacterial colonies was 1921.8 CFU/cm^2 and 2328.1 CFU/cm^2, respectively. The fungal colonies being also remarkable in the S 5 sample, the data indicating 3146.8 CFU/cm^2 (**Table 1**). The low CFU/cm^2 density values were recorded in the central area of the space (S 1, S 3).

The air is not a favorable environment for the development of microorganisms, but in the air, there are microorganisms that come from the substratum, humans contact and another different sources and these organisms could be transmitted through air currents.

The air microbiota is influenced by a series of factors: the degree of air ventilation, temperature, relative humidity, human presence and agglomeration, etc.

From the total samples analyzed by the isolated colonies, one can notice the density of fungi with over 4000 CFU/m^3 in the area destined for the passage of tourists (**Table 2**), passage with stairs (A 1) as well as near the brick wall (A 5). These data confirm the possibility of favorable factors with risk of passage to the mosaic, in the portions with cement and brick substrate where humidity and porosity are the main factors that maintain the development of fungi.

A large part of the microorganisms with pathogenicity for humans can be transmitted by air inside the exhibition hall, but at the same time they can represent

The microbiota type	CFU/cm^2				
	S2	S3	S5	S7	S8
Bacteria	131.2	81.2	1921.8	2328.1	31.2
Fungi	50	128.1	3146.8	84.3	81.2
Total colonies	**181.2**	**209.3**	**5068.7**	**2412.5**	**112.5**

Table 1.
The microbial density (CFU/cm^2) on mosaic surfaces.

The microbiota type	IMA (CFU/m^3)			
	A1	A3	A4	A5
Bacteria	112.5 x 10^2	112.5 x 10^2	253.1 x 10^2	356.2 x 10^2
Fungi	4790.6 x 10^2	159.3 x 10^2	178.1 x 10^2	4809.3 x 10^2
Total colonies	**4903.1 x 10^2**	**271.8 x 10^2**	**431.2 x 10^2**	**5165.6 x 10^2**

Table 2.
The airborn microbial density (CFU/cm^3), the index of microbial air contamination (IMA).

degradation factors for the exhibited museum objects, mosaic and other vestiges of the museum complex **(Figure 7)**.

The samples highlight the microbiological load in the air column, the isolation from repeated samples suggesting an amplified activity, especially of the species isolated on Columbia blood environment that show hemolytic activity.

Many species are found in the native, resident microbiota of the colon. Among the isolated species, *Bacillus cereus*, *Corynebacterium urealyticum*, they attracted attention on surface of mosaic samples.

In terms of habitat and pathological implications, resistance by the formation of spores at these bacteria can maked occasionally be isolated from environmental sites, which are only sources of transmission. The ease of airborne transmission of endospores is very obvious.

The most important colonies, present in all the analyzed points, are from the group of gram-positive bacilli, the genus *Bacillus* being highlighted in all the samples (*B. pumilus, B. cereus*) and *B. clausii* bacteria only in airborne (**Figure 8**).

The genus *Bacillus* includes aerobic or facultative anaerobic forms with a diversity of physiological characteristics: mesophilic, thermophilic, psychrophilic, alkalophilic, acidophilic, halotolerant or halophilic species. These characteristics also explain the presence of this genus on analyzed surfaces, with the highest frequency and diversity (**Figure 8**), being very tolerant.

Bacillus cereus grows in poor soils and frequently contaminates food. The implications in the current infectious pathology of the identified bacilli, which aerobically endospore, are the followings: wound infections, lung infections, urinary tract infections, food poisoning, rectal fistulas.

Another genus identified is *Clostridium*. Bacteria gathered from this genus are sporulated anaerobic bacteria, widespread in the soil and present in the colon of humans and animals. The pathogenic potential of anaerobes is manifested only in conditions that favor their access to the internal medium and allow them to grow. Regarding their sensitivity to antimicrobial agents, it is important to mention that *Clostridium* sp. and gram-positive non-sporulated anaerobes have retained their natural sensitivity to antibiotics, but infections with anaerobic bacteria are often mixed, including different morphotypes.

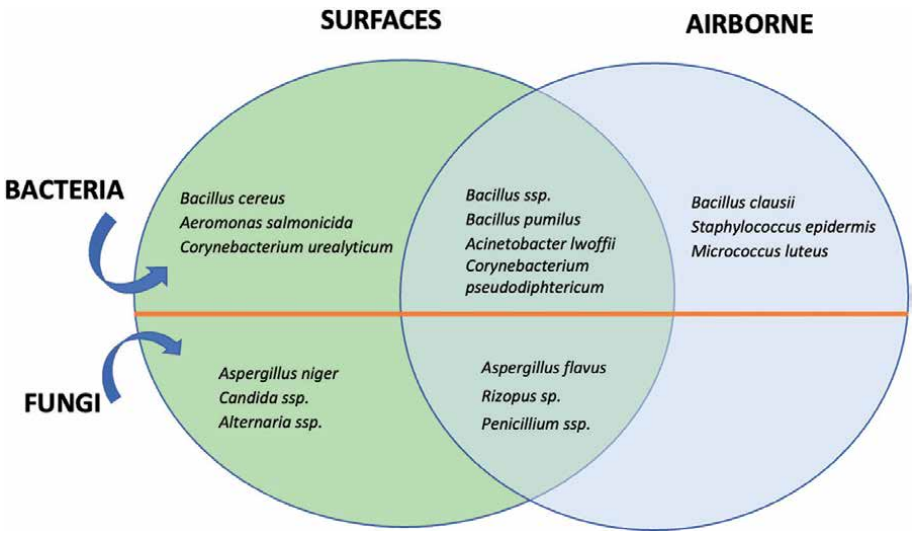

Figure 7.
The common and specific microbiota for surfaces and airborne samples diagram.

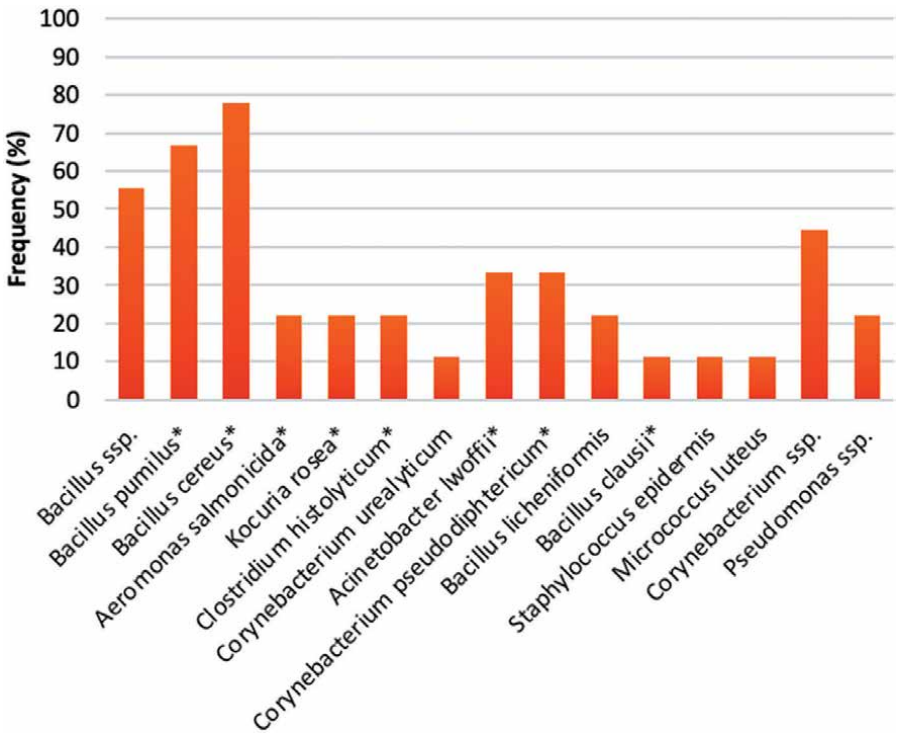

Figure 8.
*Bacterial frequency (%) isolated all samples; * VITEK microbial identification system used.*

The study of Perez et al. 2021, highlighted the fact that in the biodegradation process there are successive sequences of biochemical reactions that favor the growth of different microbial communities. The first stages of this reaction complex are hydrolysis and bacterial acidogenesis in which class *Clostridia* are involved followed by class *Bacilli*, which explains the large number of colonies in

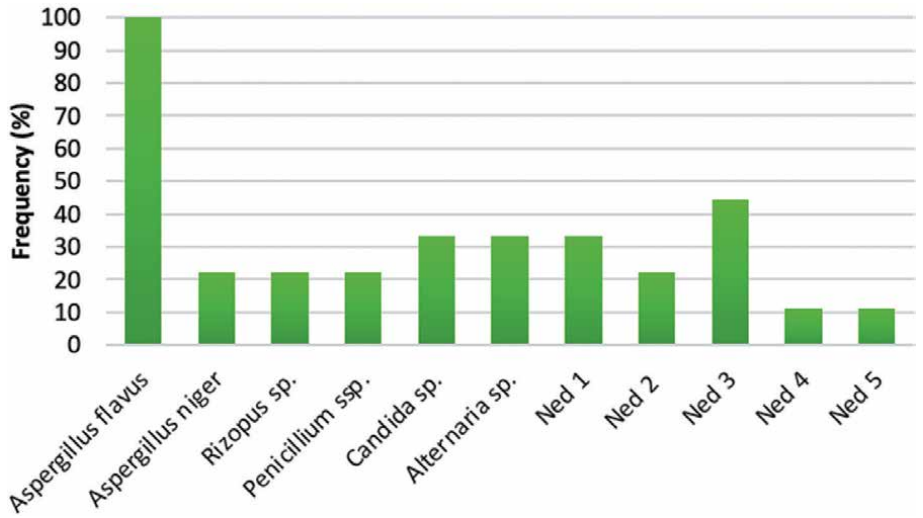

Figure 9.
Fungal frequency (%) isolated from all samples (ned 1-ned 5 unidentified species).

these categories isolated in samples taken and analyzed from the surfaces of Roman mosaic pieces named *tesserae* [27].

Another bacterial category that attracts attention, isolated from the analyzed surfaces (S1) is *Staphylococcus epidermidis* and *Micrococcus luteus*. The species is ubiquitous in skin biotopes [28]. The species *Staphylococcus epidermidis senso stricto* is a species of major medical interest, being characterized by high pathogenic potential. The presence in the samples was repeated and confirmed in the laboratory by morphological analysis of the colonies, microscopy and biochemistry.

Kocuria ssp. appears in the analyzed samples and be noticeable it stands out by the fact that the genus includes commensal forms in humans, but also in animal species. *Kocuria* spp. is also present in the environment but may have pathogenic potential in people with compromised immune systems [29].

Another species identified is *Corynebacterium urealyticum* which has the human skin as its habitat. Coryneform bacilli are distinguished by the fact that they can occasionally move from one ecological niche to another and can accidentally cause diseases (urinary tract infections, skin infections, endocarditis [30].

From the category of fungi from Ascomycota, the most dominant presence of the forms of *Aspergillus* as well as of the type of lower fungi *Rhizopus* sp. can be noticed (**Figure 9**). Also, several genera grew on nutritive media *Penicillium* ssp., *Candida* sp., *Alternaria* sp., and other five colonies were unidentified.

The genus *Aspergillus* comprises over 461 species, mostly found in saprobiosis in the environment and are rarely parasitic [31].

Aspergillus flavus is known for its ability to generate mycotoxins (aflatoxins) when grown on food substrate. As a pathogenicity, in immunodeficient subjects, it produces pulmonary aspergillosis and chronic sinusitis.

Aspergillus niger is a cosmopolite micromycete, frequently isolated from soil, but also from many organic substrates. It develops a series of mycotoxins such as aflatoxins, aspergillin, aspergin. It is frequently involved in the appearance of aspergillomas and in immunocompromised subjects causes skin, lung and systemic infections.

The genus *Rhizopus* develops rapidly in culture media but also in natural environments an invasive mycelial apparatus, with a fluffy appearance at maturity colored in black, due to sporangia. Characteristic of the genus are the rhizoids with

which it attaches to the substrate. *Rhizopus* species are generally non-pathogenic but can cause zygomycosis in debilitated patients manifested by processes of tissue necrosis [31].

By analyzing the microbiota in the air of the exhibition hall one can predict the degree of danger of a future infection of the mosaic carpet, the exhibits and which are the groups and species of microorganisms that represent the main threat to an infection of heritage objects. Last but not least, through this analysis it is possible to establish the risk of infecting the people present inside the museum complex, both employed staff and visiting public.

4. Conclusions

The results showed that the Roman Mosaic are significatively affected by multiple biological systems with biodeterioration high potential (algae, lichens, bacteria and fungi).

The species thus isolated and identified were analyzed in correlation with the implications in biodegradation, they affect the components of archeological interest, as well as in terms of pathogenic risk, taking into account the sources of anthropogenic contamination of mosaic components.

The presence, in this exhibition space, of several pathogenic genera (bacteria and fungi), confirmed as having an important pathogenic potential, draws attention to the management of cleaning and preparation of the space before and after the passage of visitors.

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Conflict of interest

The authors declare no conflict of interest.

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Chapter 6

Post-Covid Ideology and Dimensions in Language Teaching

Yadu Prasad Gyawali and Babita Parajuli

Abstract

The chapter entitled Post-Covid Ideology and Dimensions in Language Teaching aims to explore the possible educational intervention in post-covid classrooms. It focuses on the role of teachers, stakeholders, curriculum, and technologies in the field of language teaching in the new-normal classroom situation after the Covid-19 pandemic. The chapter reviews the cultural and linguistic ideology of community developed as a possible way out in the new learning situation in the context of Nepal. Additionally, it discusses the paradigm shift in teaching-learning ideologies from the theoretical to practical perspectives for language teaching.

Keywords: new-normal, post-method, transformation, pedagogy, ideology in emergencies, soft-skills

1. Introduction

Language teaching has been associated with the social function as the language teachers and learners interact with various social, cultural and cross-cultural ideologies. The social and cultural ideologies of any country can affect the language teaching and learning processes. These dimensions affecting language teaching can be the symbolic forms that circulate in the social environment. Van Dijk [1] states that ideology controls the thoughts of people and guides them by cognitive and social aspects based on norms, values, culture, identity and basic social features. As the sociocultural belief supports the formation of ideology, language teaching and learning in post-covid situations can be a part of gaining new ideology with the different cultural realities in the society. Therefore, this chapter deals with the ideologies of language teaching in post-covid situation including the role of the stakeholders, possible language instructional strategies and curriculum innovation in the classroom realities for language teaching.

2. Context

Teachers and students have not experienced such disruption in the instructional process with long duration of school closures in the history of academic field. According to the report of the United Nations, the global pandemic of Covid-19 has been affecting the world's education system and continuous learning process. More than 1.60 billion students from pre-primary to higher education in more than 200 countries had stuck at home for months due to the lockdown in the first phase of Covid 19. With the onset of the global pandemic of Coronavirus (COVID-19),

the educational sector has been facing several challenges. Students stuck at home, teaching-learning programs and examinations of primary, secondary, and tertiary levels have been postponed in many countries.

Many researchers in the field of sociolinguistics and anthropology discuss the role of language teaching in determining the cultural identity of the students. The study of Kennedy [2] indicates that language has a positive role to develop cultural identity establishing the social connection of people in the community. Likewise, Ennaji [3] explains that culture can shape the mental condition of people representing their behaviors and lifestyle based on local and national languages. Every language with a typical nature forms people's cultural distinctiveness indicating various socio-cultural realities, traditions, lifestyles, cultural values and belief systems of a society developing the socio-cultural system of a nation.

In the present context of Nepal, many students at all levels have been suffering from anxiety due to the Covid pandemic and their parents seem worried about the continuation of their children's study. Similarly, the responsible authorities and stakeholders in the academic field are exploring the possible alternatives for educational plans and interventions to address the learning situation in the pandemic. Similarly, we, as practitioners, experienced an interesting event of some students who are from remote areas have been involving in the different the community-based volunteer practices for creating learning opportunities. One of the students doing a master's degree introduced life skills and conversation skills courses to the students of his community to make them responsible in learning and develop awareness to the misleading activities during pandemic.

Despite the physical, psychological, and emotional challenges, the teachers and have been engaging in creating opportunities during emergencies. These practices lead to improve this terrible situation beyond the classroom. We have traditional faith that learning is bound within the classroom, fixed curriculum, prescribed and referred textbooks, allocated schedule, particular teacher, and predefined learning goals. After reflecting about the COVID-19 pandemic, we conceptualized a framework of transforming learning strategies from face to face to online community or alternative modes which can be accessible to the students as per the geographical and economic access during the global pandemic of COVID-19. Similarly, we need to think about teaching-learning from the angle of learning to live and learning to be responsible. Cyberspace might be another key to unlock lockdown. Learners can explore the digital materials as per their learning requirements involving in the virtual classrooms with the help of digital tools and technological skills.

In a nutshell, the concerned authorities of education sectors need to develop the contextual learning modalities and skills which can lead to the shaping future of the children. The teaching-learning paradigm needs to be transformed to the learning-sharing paradigm because the episteme of the Coronavirus (COVID-19) pandemic suggests us transforming and adopting contextual learning opportunities. Therefore, the curriculum, content, context and learning space need to be considered innovatively in the post-COVID situation and the present context may unlock the paradigm of professional culture to identify homeschooling parameters associated with social and psychological maturity to the learners of COVID inflamed society of the nation.

Many researchers, linguists and SLA scholars have been developing a variety of student-centered methodologies and approaches for effective language teaching and learning process. The following section discusses the key concerns regarding the possible approaches that can be followed for post-covid language instruction.

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3. Key issues

The section deals with the key issues which can be applied in post-pandemic teaching-learning situations. As mentioned by Arnove [4] the teaching-learning framework has been shifting to the need-based and technology-guided framework as the face-to-face learning paradigm is being shifted to the online and distance learning paradigm. Similarly, Contipelli and Picciau [5] focused on the facilitation and evaluation system of learned values and they need to be systemized based on the performance analysis of the learners as the learners are the social entity and they need to be audited by social members and stakeholders. As following [6] post method pedagogy is the baseline for the post-pandemic situation because the theory is based on socio-cultural pragmatism and focuses on the contextual principles of the locality. Williams et al. [7–9] repot that the online teaching process is the opportunity to redefine the education system during this pandemic. It can be used alternatively to address the learning vulnerabilities of many children and youth and to support students at risk during the crisis as it elaborates on the concept of the virtual environment, virtual teacher, virtual students, and a new framework of the curriculum associated with the national educational policy. Furthermore, the Nepal government, educational stakeholders and concerned authorities need to respond as soon as possible to ensure students' continuous learning spaces with safety measures as suggested by [10]. This is high time to plan and design equal learning modalities for all students throughout the country certifying the appropriate methods of evaluation. All teachers are responsible for applying plenty of resources to introduce new learning modalities accessible to the students.

Classroom situation, role of learners and instructors, medium of instruction, facilitation and evaluation, transformative attitude and research behaviors aspects are the major key aspects of post-pandemic pedagogy while teaching English in the second language context.

Henceforth the Post pandemic pedagogy can be presented diagrammatically as follow:

Figure 1 represents the conceptual framework of post-covid teaching-learning situation where teacher, learner, community, curriculum interact with educational technology based on contextual strategies, time, available resources, and

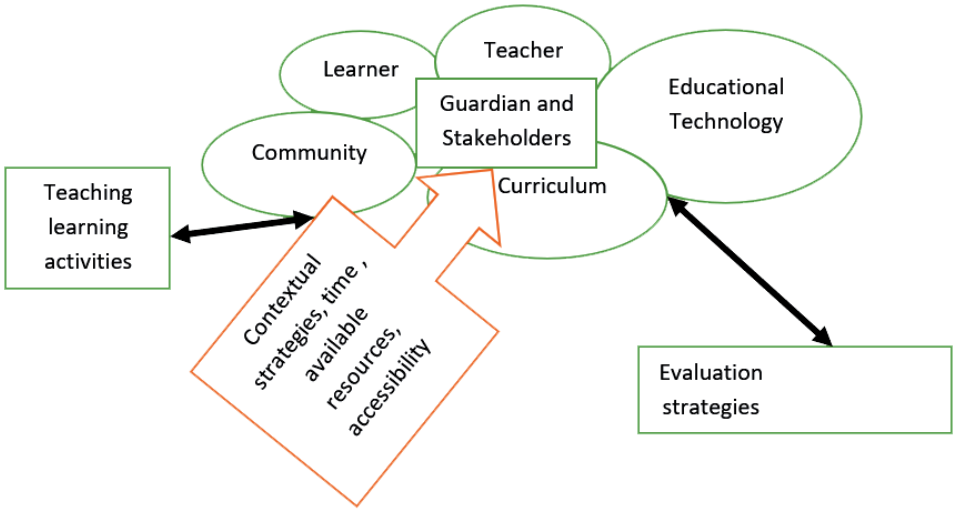

Figure 1.
A conceptual framework for post-covid teaching-learning management.

accessibility. This denotes that the pandemic creates the opportunity for several alternatives and this pandemic can play role in the paradigm shift in the attitudinal reformation of the concept of learning facilitation and evaluation as the diagram focuses on the involvement of all kinds of stakeholders in teaching-learning and evaluation procedure. Post-covid situation will adopt technology-oriented teaching, learning and research abilities and activities followed by a performance-based evaluation system in all levels of school and higher education institutions.

3.1 Classroom situation

The classroom situation is the crucial unit in the pedagogical reformation. It is believed that classroom is the space where learning situation is created. Kumaravadivelu [11] suggested that teachers' and learner's agreement in the production of learning issues is important as the principle of possibility determines the possible classroom activities where learners' autonomy can be observed. Similarly, He and Harris [12] state that Covid- 19 created a situation for online and distance mode learning management system where learners learn self-management skills and that makes them responsible for learning. The classroom situation will be open and students will be involved in the network where they can collaborate and communicate . Teräs, Suoranta [13] on the other hand claimed that the learning situation might have transformed to the technological and responsibility-related aspects and the learners might have a greater degree of participatory roles as a result they can be transformative learners. Therefore, cloud-based classroom and online community-guided learning management systems can be imagined as per the contextual relevance. In this 21st century, vocational and technical education is in the prime concern; as per the concern education is itself the highly technical concern, so we the faculties and stakeholders of the education field need to collaborate and coordinate to upgrade the value of education faculty. We need to develop a sound relationship with feeder and supporting schools as we can collaborate to share quality goods. We can develop several programs with those schools.

- Professional development support in exchange mode
- Field visit or exploration
- Sharing the best practices of feeder and support schools.
- Developing research initiatives in the schools—University could develop projects for schools. Teachers and students collaborate to complete the project.
- Internship (Long termed and short-termed)
- Teach for Improvement fellowship

On the other hand, Home is the first school for every child and parents are the best teachers. kitchen kitchen, bedroom, living room, study room, surroundings can be the classrooms for homeschooling for example – The kitchen might be the lab for Science and Health, Bedroom may be the lab for language and moral values, the living room might be the lab of practical works of all disciplines, surrounding might be the lab for social and environmental studies. In another context, parents might have a mindset of several questions such as, how to deal with languages, mathematical problems…? I don't know science, English, Mathematics…? However, all parents are not found conscious of their responsibilities and duties. Parents need

to teach about life skills, disciplines, moral values, personal duties and responsibilities to their children since lockdown is creating the opportunity. They can shape their children's practical learning by involving them in multiple intelligence-based activities such as drawing, singing, dancing, writing daily diaries, developing logic, watching documentaries and news and communicating with family members and friends.

3.2 Role of the stakeholders

Stakeholders are defined as students, teachers, guardians, community members, policymakers who contribute to learning and transfer of learning. It is believed that the role of the stakeholders determines the principles of learning management. For example, [5, 14, 15] report that the learning situation is in the control of the learning situation and learning variables such as Contipelli and Picciau [5] focus on rebuilding the learning situation in which the learning agents

Agents	Role and responsibility
Learners	• Feel free to learn
	• Engage in communication
	• Develop collaborative environment
	• Practice cooperation among peers, teachers and family members
	• Explore the content from the cyberspace
	• Develop digital skills
	• Adjustment and adaptation to the new trends
	• Improve performance in content, context, life skills, soft skills and technology
Teacher	Develop new interventions for classroom improvement
	• Facilitate the learners through face to face, distance, or online mode
	• Develop digital consciousness
	• Form social relationship
	• Fulfill social responsibility
	• Adapt to the new trends and develop consciousness to the new skills
	• Follow the new trends of facilitation and evaluation framework
	• Establish a relationship with learners, parents, community members and policymakers
Guardian	• Monitor the activities of children
	• Involve their children in household works and decision-making process
	• Develop the sharing culture with family members
	• Establish a relationship with children, teacher, school administration
	• Fulfill the basic requirements and needs of children.
Policymakers	• Share the learning modality and framework
	• Inform about the new skills to the stakeholders
	• Involve the members of all class to form a new policy
	• Develop digital infrastructure
	• Encourage to implementation of the new ideas as per the need of society and learners.

Table 1.
Role and responsibility of stakeholders.

feel safe to learn and that is accessible, affordable and relevant to the geographical, educational and economic aspects. With this reference and the country situation of Nepal, the stakeholders can contribute their role and responsibility as shown in **Table 1**.

3.3 Medium of instruction

Medium of instruction is another key issue in the post-pandemic situation. Language is known as the symbol and culture as the identity, in the pace of interacting the linguistic and cultural landscape, Giri [16] reported with the example of English and Nepali language that other language speakers are confused due to the linguistic hegemony of the elites and the ethnic identity might have the transformed to the group of linguistic dominance. Similarly, Phyak [17] illustrated through the examination system as the learners of one linguistic background are motivated to participate in the test such as IELTS, TOEFL and GRE for the migration of another cultural landscape as if they intend to access the eligibility for assimilation. However, Pherali and Garratt [18] stated that the cultural landscape got highly affected by socio-political and historical experiences as the socio-political changes deal with the reconstruction of the language surrounding the notion of marginalization and ethnicity.

Azimzadeh and Bemani [19] argue that language and culture are interrelated to communicate ideas and transformation of traditions as the people can develop and sustain cultural impression using language. Therefore, language shapes cultural ethics concerning communication and collaboration efforts. Moreover, language has the power to transform the heritage of the culture, for example, *Deuda culture* is shaped by the *Dotyali language* on the other hand the words *Maichyaang and chyaanwa* have the representation of the cultural accommodation and ownership in the preservation of the language and culture. For the context of second language teaching pedagogy, EMI has incorporated several issues based on the context of learning because the societal framework and cultural consciousness influence the practice of EMI strategies in the classroom.

Toh [20] argued that the EMI emerged with the view of policy level or its constraint to the bureaucratic purposes rather than academic purposes in the sense that it had challenges in the implementational levels due to the level of the learners, learning situation, influence of the first language of the learners and the teachers' capacity to deal with the issues related to the second or foreign language. Similarly, Lee and Curry [21] stated the challenges in the level of the teachers and students as they explored the challenges such as English language proficiency, planning time for classes, building confidence and correcting mistakes and examining the proficiency of learners in the level of the teacher, on the other hand, students had observed the challenges as decreasing rate of enrollment, lack of interaction with peers and teachers, English proficiency level concerning to the classes in the native language. However, Dang and Vu [22] claimed that the competence framework of EMI determined the pedagogical and communicative purposes by which they occurred challenges concerning EMI can be mediated by the English language and English language teaching strategies in the second language situation.

Phyak and Sharma [23] explained that the EMI policy in Nepal influenced the neoliberal ideologies as a result it primarily focused on the socio-political and cultural aspects instead of the academic perspectives. Therefore, the issues and challenges associated with the EMI shape the cultural framework to determine the forms of language as per the defined context and need to consider the learners' perception and attitude towards the use of language for different purposes.

3.4 Learning facilitation and evaluation

In terms of learning facilitation Lockee [24] suggested that online community or digital application can have important contributions and teachers need to manage with technological consciousness. For example [25–27] argue for the integration of content, pedagogical and technological knowledge. Similarly, Herring, Koehler [26] suggest that technological integration encourages the development of content-specific components of the classroom environment, which benefits classroom qualities. The pedagogical movement in teacher education, on the other hand, encompasses the key transformative views in creating changes in classroom and community attitudes and actions. In addition, Elas, Majid [28] states that technological integration in English language instruction is necessary to facilitate proper teaching in a digital learning environment and that the concept of technological, pedagogical, and content (TPACK) assists English teachers and teacher educators in associating technology, pedagogy, and content knowledge. Valtonen, Sointu [29] focuses on the necessity for all instructors to have a variety of pedagogical and ICT skills to help students build 21st-century capabilities. Teachers' readiness to learn twenty-first-century skills and pre-service teachers' TPACK skills are developed when the TPACK framework is used as one of the flexible models in teacher education. Lehiste [30] focuses that how well teachers integrate their technical and content knowledge for classroom instruction affects students' learning. Furthermore, this study discovered that in-service teachers who received TPACK training improved their technology expertise and ICT integration in their classrooms. Rodríguez Moreno, Agreda Montoro [31] suggested the learning felicitation process will follow the current trends such as problem-solving, critical thinking, creativity, virtual synchronous and virtual synchro's mode of teaching and learning from which learners' autonomy can be ensured. Gyawali [32] stated face-to-face teaching-learning modalities, distance-based learning modalities and mobile teaching. Hence the post pandemic instructional activities shall be as:

- Group interaction through virtual or physical mode
- Collaboration among the group and peers
- Network building and sharing learning
- Use of social media
- Use of easily accessible Learning management system
- Remote support from the teacher
- Community-based teaching
- Mobile teaching
- Use of digital tools and applications
- Project-based, Participatory based learning
- Learning through questioning
- Reflective activities

Despite the inclusion of formative assessment in the curricular design and policy papers, the evaluation system is still dependent on terminal and unit-based written

examinations. Baral, Luitel [33] assert that, while traditional teaching and evaluation procedures are preferred by teachers, students, and the educational system, alternative modes of evaluation are required, emphasizing the need for a paradigm shift in the evaluation system that can assess students' behavior, creativity, critical thinking, soft-skills, and life-skills to make learners self-sufficient in their practical lives. Students' low creativity, lack of critical thinking and collaboration, rote learning, dropouts, and challenges in learning achievement are all major pitfalls. The post-pandemic situation will develop learner autonomy, collaborative learning situation, learners participation, interaction to the theme-based realities and critical and creative activities as suggested by [34]. Hence formative and performance-based evaluation systems including guardians' evaluation need to develop because the learners spend most of the time with a guardian at home as a result evaluation from the home strategy will be emerged.

- Formative assessment
- Short and long assignment-based evaluation
- Project work-based evaluation
- Performance-based: presentation, participation, production
- Guardians' evaluation

3.5 Cultural ideology as pedagogical reformation

People of various castes and communities have a strong desire to retain their languages and cultural identities as a source of cultural pride since language generate and preserves culture, and culture interacts within the language system. Gurung [35] claimed, for example, that the Nepalese Gurung community intended to create uniformity in their language script to preserve and promote their cultural and ethnic identity for future generations, since they were concerned that many Gurungs were living in detached countries without exercising their spoken and written languages, and that many Nepalese youths were studying Korean and Japanese in order to work overseas. Similarly, according to Katuwal [36], Khas is a primary source of the current Nepali language spoken by Chhetris, Bahuns, Thakuris, and Dalits. Many indigenous languages in Nepal's Karnali province, including Surel, Sanskrit, Hayu, Pahari, Meche, Jirel, Dhimal, and Kumal, needed promotion and attention because they were on the verge of extinction due to a scarcity of speakers to preserve the cultural communications in these ancestral language varieties.

Some researchers contend that cultural identity encompasses more than only language preservation, claiming that many parts of culture can be replicated. For example, Chapagain [37] stated that the Raute tribe of Nepal showed their distinct cultural identity through their clothing, habits, and traditional belief system, and that they saw the world differently and cherished their nomadic nature.

Silwal [38], on the other hand, claimed that the Raute people and their offspring did not understand Nepali since they had established their nomadic lifestyle and cultural identity through the Raute linguistic system. As a result, the language system can influence how a community's cultural identity is presented.

These findings show the connection between language and cultural identity, with language loss posing a threat to people's cultural identities. As a result, people from specific cultures wish to promote their language system to maintain their ethnic dignity and cultural pride.

3.6 Acculturation model of language teaching and learning

Students' cultural identity is associated with the language teaching and learning process because recognizing language elements supports the learners to adapt various cultural sign, symbols and actions with societal consciousness in the new cultural context. Li [39] emaphasised that cultural transformation can be developed through teaching and learning about diverse linguistic features of a language that empowers language learners against linguistic and cultural hegemony. Likewise, Freire [40] emphasised about the multicultural and multilinguistic instruction that can develop cultural awareness, socio-political consciousness, and social actions to foster the cultural identity of the individuals. Nevertheless, Pinto and Araújo e Sá [41] state that language and development of cultural identity do not promote to each other however they develop continuously in the society overcoming various perspectives. On the contrary, the study of Donitsa-Schmidt and Vadish [42] emphasized that language proficiency and cultural assimilation supported North American students to understand the Hebrew language in the Israeli socio-cultural context and to establish a new Israeli cultural identity while staying there. The above literature, therefore, describes that developing language competency through language learning is one of the major factors to trace the cultural identity of language learners. It helps to promote them to assimilate into a new cultural context.

3.7 Cross-cultural identity and language transmission

The communication using a particular mother tongue in a family and community supports for learning the fundamental values, cultural beliefs, historical traditions and distinct cultural identity. Therefore, Language transmission can be the foundation for cultural transmission developing cultural consciousness to the human generations. Gelman and Roberts [43] reported that language can be the dominant factor of cultural transmission in the society which can exchange cultural skills and mental system of the people. Similarly, Kinzler, Corriveau [44] explained that mother tongue can be one of the socio-cultural identity markers of human beings because more than 6000 human languages exist in the world were mostly learned by the people in their early childhood.

Some researchers have reported that language learning can be challenging when people migrate from one place to another place. For example, the study of Bhugra [45] reported that people can experience socio-economic problems and cultural alienation to adjust in the new environment when they shifted from one socio-cultural background to the next linguistic and socio-cultural background. Language learning can be challenging which can create problems to develop a distinct cultural identity. However, the study of Miller and Collette [46] stressed that individuals can develop their multicultural identity even they migrated in the multicultural community because they can learn the languages of the target culture and develop the required skills to function in the new socio-cultural context with the feeling of pride on their own culture at the same time.

4. Conclusion

The language as an interactional tool represents students' linguistic and cultural ideology and backgrounds. Culture as a social system fosters language development in a society and largely frames the expressions of human narratives in their family and society.

In the post-pandemic situation, the teachers, parents, stakeholders and all the students need to focus on need-based language teaching and learning process respecting language they speak and cultural ideology they belong to. Pedagogical reformation leads students to com-municate in a language that means understanding and interpreting the in-depth socio-cultural values, lifestyle and directions related to a particular culture. Similarly, the paper indicates that people with a distinct language and cultural identity can celebrate their linguistic and cultural harmony as language represents the system of transmission of cultures to the next generations. As presented in the studies, languages upraise the cultural positioning of a community generating development opportunities in different fields such as socio-politics, education, media and economics.

Furthermore, language functions as a cognitive tool to express the linguistic terms relevant to the cultural background therefore shifting linguistic region may result from individuals' adaptation to the new culture reframing linguistic diversity with cultural identity. The different features and levels of mother tongue interconnect thoughts, cultural ethics, and social happenings in the form of cultural identity in the community. Therefore, trans-languaging approaches, transformative ideology and digital immersion play a significant role to reframe post-pandemic ideology in the framework of the pedagogical shift in English language teaching. Similarly, language reflects the culture and culture practices language in the community therefore language learning and transmission for cultural representation as a whole characterize the role of language in shaping and maintaining a distinct cultural identity in this changing world. All human beings need to be responsible to promote linguistic and cultural identity for pedagogical perspective in the post-pandemic period.

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Chapter 7

The Mari Lwyd Has Entered the Chat: Intangible Heritage in the Age of Covid-19

David Howell

Abstract

Covid-19 and lockdown measures severely limited social movement and interaction. These protective measures had significant impacts on intangible cultural heritage. In a global context, living and performance based forms of heritage largely ceased, causing damaging interruptions for the continuity of traditional practice. Many traditional practitioners and community groups turned to online video sharing platforms as a means of continuing and communicating their cultural forms. This chapter explores the potential and limitations of digital media as a means of maintaining intangible heritage in extreme scenarios, and questions what lessons need to be learned by heritage practitioners when considering these forms of media as part of heritage safeguarding strategies.

Keywords: intangible heritage, lockdown, social media, video conferencing, Mari Lwyd, performance heritage, choral tradition, communication, Wales

1. Introduction

Since the 2003 adoption of UNESCO's Convention for the Safeguarding of Intangible Heritage [1], living forms of cultural heritage have enjoyed an elevated status, greater visibility and are now better positioned in terms of longer term safeguarding. While ratification of the convention has been far from universal (the United Kingdom remaining a prominent absentee) [2], attitudes towards and uptake for the convention have generally been positive. With the organisational infrastructure of UNESCO and access to bodies of international funding, intangible cultural heritage (ICH) has slowly been given a platform of significance similar to that enjoyed by built and natural forms of heritage.

The emphasis placed on living forms of heritage by the 2003 convention acknowledges the particular vulnerabilities faced by this unique body of cultural forms. Traditional practice, custom and religious based activities, are dependent on living populations. Where those populations are pressured, through ageing demographics, the loss of landscapes and the influence of other cultural forms, intangible heritage can disappear rapidly. With ICH practices often being reliant on the knowledge of practitioners, the loss of a single practitioner can have devastating impacts on the long term sustainability of traditional forms. This is a challenge compounded by a historical underappreciation of ICH and a lack of emphasis placed by cultural organisations in the documenting and archiving of traditional practices.

Visibility is a major element of the 2003 UNESCO Convention. Enhancing awareness of, and, in circumstances where it is appropriate, access to ICH plays a major role in promoting traditional practice and ensuring its viability in a contemporary, global society [3]. Covid-19, however, presented unique challenges to ICH. By definition, living intangible heritage requires people and in many instances these heritage forms require the gathering of people in particular locations. The widespread use of lockdown measures meant that most forms of ICH (where lockdowns were implemented) simply ceased to be practiced. Physical heritage forms, such as built structures, while often reliant long term on tourism derived funding, are not directly damaged by restriction on movement of people. For natural heritage, movement restrictions were recorded as having positive impacts as environments were able to recover from the damage of tourism, traffic and pollution [4]. Intangible heritage, however, is particularly sensitive to rapid changes in social structures. The loss of a narrow body of practitioners to ill health or old age, the interruption of traditional practice threatening the very notion of a practice being 'traditional' and the inability of younger members of communities to have access and exposure to practice, all directly threaten the viability of living heritage, short and long term.

Despite the range of specific threats and challenges facing communities and individuals who act as custodians of ICH, access to new technologies has provided mechanisms by which practitioners and communities have been able to continue, to varying extents, to practice and promote their activities. This chapter considers some of the ways in which online video sharing platforms and online video conferencing has made it possible for communities to explore ways in which their cultural activities could continue, in spite of the threat and movement restriction consequences of Covid-19. While such technologies are increasingly accessible, heritage professionals need to be cautious about the use of digital resources, question whether the digitisation of tradition can undermine the integrity of practices [5], and remain aware that digital archiving can only ever serve as a support mechanism in the process of safeguarding living traditions.

In this chapter, specific attention will be given to forms of intangible cultural heritage in Wales. Wales offers a distinct case study as intangible heritage is not formally acknowledged within the nation, the overarching government of the United Kingdom deciding to not ratify the 2003 convention [6]. Without formal structures of support from the Welsh or British governments, and an inability to access support from UNESCO, the emphasis on free-to-use digital technologies is of particular importance. The response of Welsh choral groups to the adoption of digital technologies will be considered, in addition to an extended exploration of the role of the Mari Lwyd custom. The Mari Lwyd is often described as an 'ancient' tradition, though it is probably rooted in the late eighteenth and nineteenth centuries. The tradition is focused on an animal head effigy, specifically a horse skull. The decorated skull would be carried around communities during the Christmas period, visiting households, where competitive rhyming and poetic battles would play out, as the Mari Lwyd 'party' would attempt to gain entry to people's homes [7]. The practice would see the party invited into a house, where food, drink and song would be shared, before the Mari Lwyd horse and companions would move on to the next household. The tradition was seen to decline sharply in the early part of the twentieth century, but became the focus of revival movements in the later part of the twentieth and early twenty first centuries. Both the Mari Lwyd and Welsh choral traditions are regarded as distinct forms of Welsh heritage and are increasingly used as reference points in any discussion of Welsh culture. The resilience of such traditional forms is of significance in the safeguarding of Welsh cultural identity, and the responses by curators of these practices to maintaining traditions in time of

Figure 1.
Examples of the modern Mari Lwyd. The Llanfihangel Mari Lwyd is shown on the left, made out of wood, the Chepstow Mari Lwyd uses a horse skull, on the right. Authors image.

Covid, is revealing of both the potential and limitations of digital communication technologies, in the distribution and archiving of living traditions (**Figure 1**).

2. Video conferencing and virtual choirs

While communication via digital platforms was firmly established prior to the Covid-19 pandemic, the normalising of video conference meetings for non-work based activities stood out as a significant evolution in social communication during this period. As 'stay at home' mantras became common place in most western European States, employers, community and family groups began to make more liberal use of digital platforms which would allow for multi-user visual presences. This alternative to 'in-person' gatherings allowed for work based collaborations to continue almost as normal (though many businesses had already utilised *Zoom* and related platforms from the beginning of the second decade of the twenty first century. A notable distinction though, came in the form of community groups making use of such resources. During the pandemic, the largely free *Zoom* platform meant it was possible for local groups to continue 'meeting' and conducting or performing events and activities, allowing for both a sense of continuity of practice, and community participation [8].

Studies conducted into the emergence of 'Virtual Choirs' illustrate the potential benefits of video conferencing in the context of practicing intangible cultural heritage [9]. Choral singing is a cultural practice critically dependent on social interaction – the importance of being able to stand/sit next to and hear another individual or members within a group, audibly perform, being of profound importance. In turn, continuity of practice is of value for the progression of personal and

group performance skill levels. In addition, in a Welsh cultural context, the role of choral tradition can arguably be traced to the seventeenth century [10], providing almost three hundred years of cultural, performance driven, continuity. The social gathering restrictions (where particular emphasis had been placed on the dangers of singing or shouting in confined spaces with other people) meant choral gatherings were impossible. However, the adoption of conferencing technologies, and the innovative establishment by Eric Whitacre of the 'Virtual Choir' online community, meant choral groups were able to maintain a version of group performance [11].

A limitation in the 'Virtual Choir' model, however, was the inability for performers to hear each other sing. While group moderators were, in theory, able to hear all performers at once, it was more likely the case that moderators would mute large numbers of those within the group, due to the poor quality of sound transmission from multiple users performing at the same time [12]. These performance based challenges were echoed in the Welsh Government's inquiry into the impact of Covid-19 restrictions on the creative sectors within Wales. Members from the Welsh Association of Male Choirs highlighted this challenging balance between technology facilitating gatherings, while not being able to maintain equivalence for 'gang singing'. The Phoenix Choir (Swansea) noted that 'time lag makes singing during the meeting tricky unless everyone is muted' [13]. Caldicot Choir described the Zoom platform as being 'no good for a practice unless you like singing to yourself' [14], while Brecon choir seemed more positive about Zoom as a platform for practice, though still acknowledged that all participants had to be muted [15].

An additional challenge noted within the Welsh choral community, was age demographics and 'new' technologies. While *Zoom* platforms presented opportunities for the community groups to gather in digital environments, this was only applicable where access to technologies was possible, and user confidence high enough. Burry Port male voice choir stated that 'far too many members [are] technophobes…Most don't even have a mobile phone' [16]. Dowlais choir observed that 'with so many elderly members, many do not have the appropriate devices to be able to join in [with planned Zoom meetings]' [17]. Whereas the 'Virtual Choir' project perhaps had success while appealing to more urban choirs, and younger demographics, those practitioners of intangible heritage forms in rural communities, where demographics tend to be significantly older, are not necessarily empowered by the mere existing of group chat technologies and might even risk furthering a sense of isolation as anxieties regarding technology manifest. The Welsh Government report into the impact of Covid-19 on Welsh language community groups further highlighted this issue, where the 'older generation' were seen to be unwilling to make use of available technologies [18]. This was despite many community based activities continuing via digital platforms, potentially further isolating some members as a consequence of the technology being utilised to maintain group cohesion and practice. In addition, choral groups in particular were identified as among those least likely to have learnt any lessons regarding their own management and sustainability during the period of Covid-19 [19], perhaps further highlighting issues regarding age demographics and related resistance to change/adaptation/new technologies. This further reinforces a key point, that access to 'new' technologies is no guarantee of adoption.

Despite instances of reticence regarding the use of digital communication platforms for older practitioners of intangible heritage forms, or frustrations expressed with the limitations of the same platforms, wider global examples suggest that the implementation of digital platforms for the transmission of traditional practice has had some success. Considerations of the health of representative examples of Intangible World Heritage in Spain reveal the potential for digital platforms to both promote and increase access to ICH. A UNESCO review into Spanish ICH recorded

the expected widespread cancellation of many performance driven elements. Public performances of the flamenco, castells (human tower) building, ritual drumming (in the form of the Tamboradas) and processional horse drives all faced widespread cancellations. However, all Spanish examples of intangible heritage to be inscribed on the UNESCO list adopted some form of digital presentation as a means of communication of events and practices. This ranged from the sort of practice based workshops and rehearsal elements seen among choral groups in a Welsh context, to the distribution of recorded materials through social media platforms, the development of online training projects, and the performance and/or development of virtual tours to ensure wider user access to intangible cultural forms [20]. While the vulnerability of intangible heritage was acutely highlighted as a consequence of lockdown measures, the potential for transmission and in turn, sustainability, through digital platforms was successfully exhibited.

In addition to the monitoring of Spanish intangible heritage forms, UNESCO launched eight initiatives, as part of their 'Living Heritage and the Covid-19 pandemic: responding, recovering and building back for a better future' project [21]. Drawing on recommendations based on community feedback regarding the way in which intangible heritage forms have been weakened as a consequence of the pandemic, UNESCO oversaw activities which would provide test cases for enhancing the sustainability of ICH in the immediate post-pandemic period. Virtual platforms have been established as a major component of the UNESCO led interventions. In Barbados, virtual 'links' were established to allow for practitioners to 'meet' and to enhance both accessibility to and visibility for ICH [22]. Similar activities were undertaken in the South American nations of Bolivia, Colombia, Ecuador and Venezuela, where online platforms provided an environment in which practitioners could meet and share reflections on the themes of sustainability, as part of a response to Covid-19 pressures [23]. In Bosnia and Herzegovina, an emphasis was placed on digital archiving and recording of intangible forms [24]. While it is likely that such recording activities would have been aspired to anyway, as part of ongoing safeguarding measures, the urgency provided by the circumstances of the pandemic has meant that increased funding has been released to facilitate the implementation of such projects, with a likelihood for similar activities to be explored and expanded in other regions where ICH has been notably compromised. Therefore it is possible to consider the Covid-19 pandemic as a potential stimulus to the safeguarding and longer term viability for specific intangible forms. While communities might have desired to conduct recording activities, or to build networks, the inability to 'practice' traditional forms may well have served to highlight both the urgency of such interventions, and the related vulnerabilities of local intangible heritage to rapid social change.

While there are degrees of overlap between the activities undertaken, of their own initiative, by Welsh choral communities, and the more structured programmes launched by UNESCO, the critical distinction is funding. Welsh intangible heritage lacks any formal recognition within the Welsh and British legislative structures [25], a system of oversight and neglect for intangible heritage mirrored across England as well [26]. As a consequence, there is little in the way of formal support and structure for the safeguarding measures undertaken by Welsh choral societies. Indeed, Welsh Government led investigations into how choral groups have managed within lockdown settings, further highlight that political leadership in Wales has offered little more than a means to record and analyse that which community groups have already undertaken themselves, rather than leading with and funding central government shaped policies on safeguarding ICH. While considering themes of sustainability, it is questionable how long community groups will be able to maintain their digital activities and presence without formal support.

3. Limitations and risks of ICH online

The potential for digital technologies to provide a level of safeguarding for intangible heritage forms is undeniable. If nothing else, the mechanism of affording lines of communication between practitioners was critical to maintaining that element of 'community' which gives life to custom and tradition. In addition, though, an emphasis on recording and enhancing the visibility of tradition through online platforms, has profound potential in ensuring future generations have the means by which to access practices when circumstance might not allow for in-person engagement. Yet the very process of recording performance based heritage, with the intention to make that material accessible for wider audiences, is far from a simple process of 'record – upload – go live'. Critical thought must be given to issues of ownership, both of the source material and recorded archive, while consideration must also be given to source communities and whether they desire their cultural material to be digitised and distributed in the first place. That we, as heritage practitioners, can produce digital archives, does not resolve the question of whether we should.

In our desire, as heritage practitioners, to document threatened forms of ICH, the role of source communities in the production, maintenance and distribution of the final resources must be emphasised. Hennessy summarises the role of dialogue in the development of a visual record of firewalking practices among the Sawau Tribe in Fiji. Here, the creation of a visual record in the form of a DVD, was one which deliberately focused on distributing related resources only among local community groups, and not for web based distribution [27]. The creation of what was ultimately a limited (in terms of audience) resource might appear at odds with the process of enhancing visibility of traditional practice, yet, if source communities are anxious about the way in which those records, or the traditions themselves, might be used as a consequence of wide spread distribution and access, then questions must be asked as to who the resource is being developed for. Our capacity for the digitisation of cultural materials is without a historical precedent, further, with the significant affordability and availability of smartphones and supporting data networks, bringing ICH archives to a global audience is a relatively simple process [28]. However, a forced 'liberation' (without consent or approval of source communities) of an otherwise intimate tradition through digital media, would be little removed from former colonial practices which led to the removal without permission of thousands of ethnographic items, many of which are now subject to repatriation claims.

In the context of choral groups, the performative, audience driven nature of the tradition might serve to supersede the above concerns. This aspect of Welsh ICH is not driven by ritual or subject to sensitive materials. Yet, copyright and ownership issues are as valid a point of concern here as they are with traditional tribal practices in Polynesia. Choral groups suffer fiscal penalties for the misuse of copyright owned sheet music [29], and the digitisation of performance material in which 'owned' or otherwise licenced music may cause problems. Who owns the written music? Is it the author, the choir, those who produced the recording? In addition, are all of those who appear in the recording happy to be digitally displayed to a wider internet based audience, or was the intention of the performers to be seen by no one other than those who attended the specific performance in which a recording took place? In the context of choral practice, it is feasible to find solutions to such issues, as practitioners can be traced through the organising body of the specific choirs. A more free form cultural practice, such as the Mari Lwyd however, presents different challenges.

The very nature of most manifestations of the Mari Lwyd means that there is only ever a degree of structure. While the 'official' element of a Mari Lwyd – the

form of the horse, a prearranged set of venues to visit and a core Mari Lwyd 'party' to accompany the horse effigy – remains generally consistent, Mari Lwyd events will usually evolve into a more fluid occasion. Party members will drop out and be left behind at some venues, other people will then join the procession. As new voices join the party, the repertoire of the gathering evolves. A new range of verses and rhyme can be introduced, some of which will be spontaneous compositions. Other contributors might perform more popular contemporary arrangements. In such instances, questions over the recording and archiving of the event become problematic. Where does ownership of the performance piece ultimately reside? Should 'popular' (licenced) verse be performed; can these be included in a digital archive which is then shown to a wider public audience? The same question must then be probed: should materials be kept for display in a digital, online setting? In turn, are all participants happy to be recorded for both archiving and digital display purposes? Gathering consent of practitioners in a fluid, public event, is not without challenge, yet to draw attention to filming and seek permissions prior to the occasion would inevitably change the nature of the occasion – an awareness of a camera recording potentially changing the way in which members would perform, behave, or alter the nature of what is being performed.

4. Continuity, cultural practice and Covid-19

Continuity of practice is a critical element for the safeguarding of intangible heritage. Significant attention is given to the challenge of ageing demographics among practitioners, and the reduced number of younger, local, potential participants for traditional knowledge to be passed on to. In addition, the loss of place, the physical setting in which ICH is practiced or performed, is a growing point of concern. This issue is considered in the context of compromised environments, natural landscapes being undermined through development activities, or traditional-territorial spaces decreasing in size [30], limiting the areas in which ICH can be practiced, if practiced at all. For the Mari Lwyd custom, while earlier forms of the tradition moved around communities and the homes of (often unsuspecting) community members, the modern form of the tradition has come to concentrate on public houses and similar establishments. The restrictive Covid-19 lockdown measures meant that what had become traditional venues for the custom, namely pubs and bars, were now no longer viable as host venues. While broader social restrictions placed on gatherings and social movement meant that traditional practices such as the Mari Lwyd would have been unlikely to continue anyway, the interruption of relationships with host venues is an important point of consideration.

The temporary loss of host venues for the Mari Lwyd has a number of short and long term consequences. The initial loss of access to venues results in an interruption in the continuity of practice. The establishment of an example of ICH as being 'traditional' can occur over a very short space of time. For the Llanfihangel tor y Mynydd Mari Lwyd, the practice of 'performing' the event on the 6th of January, was a detail 'enshrined' in the practice of this particular local variant of the tradition, after only a single year of practice. On the first occasion of the Llanfihangel Mari Lwyd event occurring, the 6th of January fell on a weekend. In subsequent years, the 6th of January fell on weekdays (less favourable for some original practitioners) yet there was staunch resistance to change the date because, after only one year, it was deemed that the 6th was the only day on which the event could take place [31]. In turn, relationships between cultural forms and specific venues or locations, can become established and expected within small windows of time. Covid-19 interrupted this continuity of tradition and venue. In some instance, these

interruptions will become permanent as host venues cease to trade, while subsequent lease holders of properties may be disinclined to host such specific and (for some) sensitive forms of cultural practice. It is possible that Mari Lwyd forms might lose all of their 'performance' venues – a community with only one public house, which might have been forced into closure for economic reasons, may leave the tradition with no hosts as all (the modern variant of the tradition having become increasingly dependent on the good will of public houses). However, the possibility remains that the loss of public houses as host venues may precipitate a return to a more 'mobile' Mari Lwyd, which visited households within the community instead. This evolution would mark a return to the more 'traditional' Mari Lwyd, recorded as visiting homesteads during the nineteenth century. This though would require the ICH form to survive Covid-19 interruptions, something that cannot be guaranteed.

The Chepstow Mari Lwyd example is striking in a context where rapid growth of a tradition, and social restriction factors have critically undermined the practice. The Chepstow Mari Lwyd, first formed/performed in 2004 had grown to become one of the most well-known examples of a modern Mari Lwyd custom. A distinctive element of this traditional variant is the emphasis placed on a gathering of Mari Lwyds in one place. Rather than a single horse head effigy making its way through a community, Chepstow encouraged Mari Lwyd practitioners, and the practitioners of related, regional, variants, such as the Poor Ol' 'Oss example from the west country, to gather together on a moveable date in mid to late January. At least ten examples of Mari Lwyd variants have been recorded gathering in this event [32]. In addition to each visiting Mari, it became a norm for dance troupes from the locales of each visiting Mari to attend as well, meaning that the combination of host practitioners, visiting practitioners and attending spectators, created an event that was witnessed by hundreds, a distinct removal from the more intimate nineteenth century examples which would rarely feature more than double figures within a Mari Lwyd party.

However, in response to the rapid growth of the tradition, organisers of the event suspended the Chepstow Mari Lwyd in 2020, saying that 'the Organisers feel that The Event has outgrown the limited facilities that our Town has available to us' [33]. A similar trend regarding exponential growth of a tradition was also observed as part of the Llanfihangel Mari Lwyd where, as the event grew in popularity, homeowners who had originally enthusiastically welcomed the Mari Lwyd, grew to become frustrated with the increasingly large numbers of 'new' people coming to their homes as part of the event. In the Llanfihangel example, this led to the abandonment of visits to households, with a sole focus being placed on visiting the local pub [34]. The growth and popularity of ICH forms, while generally a cause for celebration, can also have several negative impacts. Large numbers of spectators can ultimately cause traditions to change, or organisers feel compelled to compromise aspects of the tradition to accommodate the demands of audiences. In the instance of the Chepstow Mari Lwyd, an event which originally marked the appearance of only two Mari Lwyd horse heads, and a participatory audience of roughly fifty, grew to the point where it was no longer deemed plausible for the town to host its own Mari Lwyd event. Arguably, the popularity and demand for this local form of intangible heritage, has directly led to the loss of it. Striking the balance between the visibility of a tradition and increasing access to it, is not a guarantee of sustainability, and can quite often undermine this principle [35].

For Chepstow, the initial decision to suspend the cultural practice for one year was then extended by Covid-19. While it is unclear if the Chepstow Mari Lwyd would have returned in January 2021, what form it would have taken and indeed whether the event would have taken place in Chepstow at all (given stated reservations by organisers about the limitations of the town for hosting large social

gatherings), social circumstances enforced a continuation of the suspension. The Chepstow Mari Lwyd has therefore been absent as a cultural practice for two years. Former lead organisers of the event have since left the body which oversaw this Mari variant [36], and the continuity of practice and relationships with hosting establishments has been broken. There is nothing to say that these connections will not be quickly re-established, yet there is an inherent vulnerability for any cultural practice to come back from an absence. The loss of key practitioners, or changes in ownership of host venues have the potential to weaken momentum, or remove key hosting sites from the equation altogether. While digital variants of the Mari Lwyd (including Llanfihangel) will be discussed further in this chapter, it is perhaps of note that the Chepstow Mari Lwyd did not have a 'substitute' digital presence in 2021.

While many Mari Lwyd groups found means of expression through Zoom and YouTube, the Chepstow Mari's absence in this period was total. This perhaps reveals a weakness or vulnerability within the Chepstow variant. The issues that led to an initial suspension in activities leading into Covid-19, meant that momentum and continuity of practice was not there to maintain anything digitally while moving into a phase of social lockdown. 'Smaller' examples of the Mari Lwyd, those focused on the appearance of a single horse head effigy, within a local community setting, do appear to have embraced digital platforms more effectively and indicate that traditional practice which is focused more on community than on visiting crowds, are in turn more sustainable and resilient to rapid change.

Digital manifestations for ICH remain a limited forum in which practitioners can express themselves and their cultural practices. Yet, for the near two yearlong (at time of writing) period of Covid based interruptions, such platforms provided a degree of continuity. If nothing else, practitioners have been able to 'meet' and converse. Elements of traditions, especially those with heavy emphasis on performance, can still be delivered to groups and audiences. For annual events, avoiding the total loss of a cycle of performances could be critical to continuity, providing a reference point and something to build on for future years. For 'smaller' examples of the Mari Lwyd, it is possible that the recreation of related events through Zoom-like platforms was more viable than the Chepstow tradition – Chepstow being so large in scope that any digital exploration of the practice would struggle to replicate the sense of scale of the occasion. In turn, it might prove that smaller examples of cultural practice might prove more resilient going forward, as they are more able to adapt to the use of digital resources to share their performance elements. Finally, instances where a 'Zoom Mari Lwyd' was formally recorded provide a potentially unique opportunity for video archiving. Given the often fragmentary and chaotic nature of a Mari Lwyd evening, documentation and filming of the modern Mari tradition is rare and of variable quality. While Zoom events lack the link to location, place and, arguably, community, a formal recording of the event continuing in lockdown allows for communities to have a point of reference going forward and the beginnings of what be described as an accidental digital archive. More formal, institution led collation of digital Mari Lwyd recordings in lockdown could further aid in the safeguarding of the tradition and in the monitoring of where living examples of the tradition continue to be practiced.

5. The Mari Lwyd and digital dissemination

The twentieth century revival of the Mari Lwyd has been significant in the context of Welsh intangible heritage. Following the establishment of a small number of revivals between the 1960–80s, predominantly focused in the former county

of Glamorgan, a much wider spread (and perhaps what should be recognised as a distinct stage in the history of the tradition) revival was recorded across Wales at the turn of the twentieth century, into the early part of the twenty first century. Coinciding with a digital revolution, the commonality of smartphone ownership and social trends of filming and uploading experiences to social media platforms, the Mari Lwyd revival has been the subject of extensive, though informal, documentation.

While recordings of Mari Lwyd – Zoom events are notable additions to the archiving of the tradition, platforms such as YouTube had already become de facto digital archives as amateur recordings of events became commonplace. The Cwmafan Mari Lwyd, in the Afan Valley, was recorded in 2015, following the smaller Mari Lwyd party of four members, enacting the tradition within The Brit pub. The 'pwnco' poetic rhyming battle plays out among the party members at the door of the pub, before moving inside where members of the public participate in gang singing [37]. Of importance, the Cwmafan recording also includes a short interview with the Mari party members, explaining why they maintain the cultural practice – a level of detail rarely recorded in the context of the Mari Lwyd revivals. Moving into the first year of lockdown, the Llandinam Mari Lwyd was recorded on the 4th of January, 2020. Taking place in both the Church of St. Llonio and the Llandinam Village Hall, this more formal recording documents the arrival of the Mari Lwyd at the church, set piece songs within the church, and a ceilidh dance following [38]. The recording is of particular value as it documents the use of the 'Poor old horse' song, a verse more commonly associated with English variants of the Mari Lwyd custom. This detail reflects the geographic area in which the Llandinam Mari Lwyd is enacted, close to the more anglicised area of Newtown on the northern part of the Welsh-Anglo border. The addition of lockdown Mari Lwyd videos, feeds into and further develops the body of resources already established in an amateur context.

As explained above, the adoption of social media and video conference technologies has been of critical value for practitioners of intangible heritage forms, and has been identified by bodies such as UNESCO as being of significant value to assist in safeguarding programmes. Several groups responsible for the maintenance and performance of Mari Lwyd variants adopted these technologies as a means of continuing their practice during the period of lockdown. While lockdown measures made social gatherings, an inherent element of a Mari Lwyd event, impossible or even illegal, platforms such as Zoom provided a viable alternative in which events could continue, albeit in severely abridged forms. Discussed below are four examples of community groups, or individual practitioners utilising digital platforms, with consideration given to the potential and limitations of such communication methods, in the performance and safeguarding of this unique form of Welsh heritage.

Mentrau Iaith Cymru, an organisation responsible for the promotion of the Welsh language, produced a short video where a Mari Lwyd was 'interviewed' about its experiences during lockdown [39]. While intended as a humorous work, the video also serves to discuss the nature and form of the Mari Lwyd practice, in addition to inviting Welsh language learners to participate in a digital 'pwnco' [40]. The poetic battling which would normally take place between the Mari Lwyd party, and those inside a home or a pub, is frequently performed around a single tune, where performers spontaneously sing rhyming verses in an effort to out-do those on the other side, and secure entry for the Mari Lwyd and the travelling party. Multiple video entries were submitted, with some performers filming themselves with their own Mari Lwyd horse head examples in the background [41]. This allowed for a key element of the Mari Lwyd tradition, the 'pwnco', to be given far greater prominence

than is given in many modern Mari Lwyd examples. The contemporary form of the tradition tends to see performers deliver the 'pwnco' from a song sheet, using the words committed to paper by the Reverend William Roberts in 1852 [42]. These performances though usually lack the spontaneity seen as a critical component of a 'pwnco'. While video responses to the Mentrau Iaith invitation for pwnco performances were generally delivered from written down notes (therefore lacking the spontaneous element), each submission was unique, and encouraged the process of creative writing through the medium of the Welsh language.

In the increasingly standardised form of the performed Mari Lwyd, where performers sing from a song sheet, to a set schedule of songs and activities, the tradition might be seen to 'fossilise'. Rather than being a living form of heritage, the enactment of the tradition in such a way so as to 'do the Mari Lwyd correctly' rejects key elements of the custom. Mentrau Iaith successfully encouraged people to explore the process of creative Welsh language verse writing and, arguably, made a significant contribution to the promotion and raised(greater?) visibility of a critical component of the practice, one which is otherwise overlooked or over simplified in the modern manifestation of the custom.

In a similar vein, the Llanfihangel tor y Mynydd Mari Lwyd event encouraged participants to deliver creative performance pieces within the context of a Zoom meeting. The Llanfihangel Mari Lwyd is one of the late twentieth century 'revivals' [43], first documented as being enacted in 1999 [44]. This variant had been performed without interruption every year, including one winter where extreme snow fall meant it was impossible for the Mari Lwyd party to converge, the Mari Lwyd head was still taken out and walked around part of the community. The Llanfihangel Community group decided to develop a Mari Lwyd Zoom event, where numerous households within the community were able to join in with singing, poetic verse and storytelling. The community Mari Lwyd, a rarer wooden example, can be seen in the background of the home of the Mari party 'leader' [45]. Participants engage in 'gang singing', with individual households then performing prepared stories or solo singing elements. In this regard, the Mari Lwyd Zoom event bears a closer resemblance to the living (in person) tradition, where members of the Mari party might be called upon to deliver a unique performance, though once again, the spontaneous element is compromised is order to accommodate all those attending the meeting and the limitations of the technologies involved. All performance elements in this example were prepared in advance and a more formal schedule had also been distributed prior to the event. The event was also private, focused on local community members. Access to the digital gathering would be provided by a code, so further aspects of spontaneity provided by individuals arriving on the night was not a factor.

Between the emphasis on new creative pwnco verses through the Mentrau Iaith Mari Lwyd event, and the gathering of people and voices in one digital space through the Llanfihangel Mari Lwyd, it is possible to see how key elements of the Mari Lwyd custom can be maintained in a digital environment. Yet, it is also challenging to bring all of the key elements together in a single digital setting. Other examples of Zoom based Mari Lwyd meetings highlight the challenges faced in replicating or adapting the tradition to a digital platform. Several examples of late 2020/early 2021 Mari Lwyd videos have been shared, where old footage of Mari Lwyd outings is edited together with new dramatic readings or musical overlays. David Pitt, musician, records the appearance of a Mari Lwyd in Swansea, Christmas Day 2020. Filmed during lockdown, participants operated from within one household, filming a Mari Lwyd on the household's own front door [46]. The short 90 second video includes one verse or song, with only an accompanying musical track, though the video still captures a sense of the nature of a Mari Lwyd arrival at a home.

The final example for consideration records a Zoom meeting shared by Eleanor Greenwood, from late October 2020 [47]. The video opens and closes with verse accompanied by music, but the focus of the production is the gathering of four Mari Lwyds on screen simultaneously. This is a closer, digital, representation of the Chepstow Mari Lwyd variant – one which places greater emphasis on the presence of a large number of Mari Lwyd horse heads, over elements such as the spontaneous pwnco. Indeed this video features no rhyming battles, or singing (the only such element coming in the form of a recorded track played over the closing stages of the video) (**Figure 2**).

As traditions evolve, departures from source material are not uncommon, and it is possible to argue that entirely new tradition forms emerge from attempts to maintain or re-establish early cultural forms. This has been argued in relation to the Chepstow Mari Lwyd, where the form of the event is so removed from that which could be described as a traditional Mari Lwyd, that what has instead developed is a distinct, unique form of intangible heritage [48]. While digital Mari Lwyd examples from Mentrau Iaith and Llanfihangel seem to aspire to replicate and digitally archive the early Mari Lwyd form, the Greenwood video (described as such because the recording does not have a singular geographical or organisational affiliation) creates a digital archive entry for the Chepstow Mari form, first established in 2004. The four Mari Lwyds filmed, look into the screens, performers occasionally 'clacking' the jaws of the skull (a feature of Mari Lwyd performances). The emphasis here is on the multitude of Maris, the cultural practice of gathering Mari Lwyd examples from different geographical locations in one place. As discussed above, the Chepstow variant of the Mari Lwyd does appear to be vulnerable, after exponential growth and concerns regarding the viability of the host town to continue supporting the event. This digital record of the practice of gathering multiple horses in one location may prove to be an important documentation should the practice in places like Chepstow fail to re-establish after lockdown.

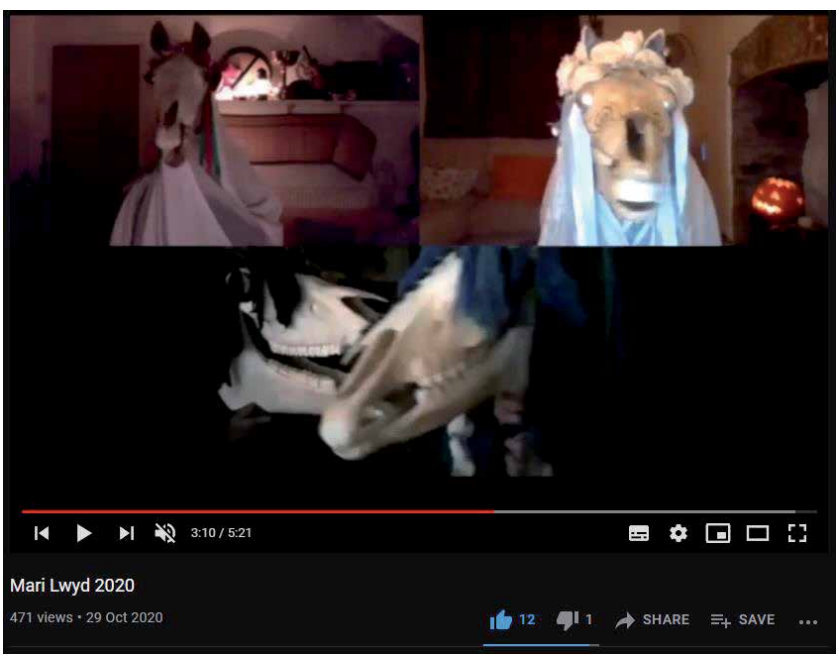

Figure 2.
Four Mari Lwyd examples appear on screen together as part of a digital alternative to in-person gatherings. Image provided by Eleanor greenwood.

Finally, while digital platforms have the potential to increase visibility of traditional practices an increased audience is in no way guaranteed. As seen with the Sawau tribe, the production of a digital resource does not automatically conflate with a desire for the recorded practices to be distributed to non-local viewers. While video platforms like YouTube are publicly accessible, community groups may upload materials in the expectation that those resources will only be sought out by those closely related to the community. A desire to increase knowledge of a particular local tradition, through shared video media, is challenging in light of the vast body of material uploaded onto video sharing sites. If it is the intention of communities to become more visible, extremely low viewing figures on all of the materials discussed above would suggest that significant work is required should communities wish to realise that ambition. This point is worth further consideration in light of the pilot projects developed by UNESCO, where social media and digital platforms are seen as critical to the enhancing of access and visibility. Such objectives can only be achieved with additional promotional activities, otherwise the engagement and reach of such video based materials may extend no further that the communities which produced them, or were the source for them.

6. Conclusion

Digital technologies have provided a communications lifeline for practitioners of ICH during the Covid-19 pandemic. In some instances, the social aspect of ICH has been maintained, as choral groups gather to informally practice together online, with participants fully recognising the limitations of video conferencing resources for actually singing together as a group, but instead utilising the platforms as a means of maintaining a sense of community. It is the sustaining of these communities through a period of extended social isolation which will be critical to bringing practices back into a performance, audience driven environment in the years to follow. Without the continuation of practice, many choral groups may well have ceased to operate, leaving gaps in the Welsh cultural performance landscape in the short term, and breaking a continuity of choral tradition in Wales that dates from the seventeenth century.

Maintaining cultural practices such as the Mari Lwyd, through video conferencing, further allows for continuity of custom to be achieved, in an albeit highly limited form. Those cultural forms which depend on movement through landscapes, interactions with households and differing public establishments (namely public houses in this example), will struggle to replicate such elements in a digital context. That a digital archive now exists for some of these practices that, without Covid, may never have been formally committed to film, is an important step in maintaining the visibility of such traditions. However digital technologies must be seen as a resource that can assist in the support and safeguarding of traditions, rather than ever serve as a replacement.

The challenge for heritage professionals now, especially in nations like Wales where there is no formal infrastructure for the safeguarding of intangible heritage, is to find ways of working with community groups that allow for informal digital archiving of tradition to strengthen the status of ICH forms. The creation of recordings does not equate with higher levels of interest in or appreciation for cultural forms. Equally, the heritage sector must be cautious in respecting the wishes of host communities and acknowledge that while digital archiving is an increasingly affordable and viable pathway to pursue, it is one which may not always be consistent with the desires of the source communities themselves. Finding the appropriate balance between a desire to safeguard and promote practices, two objectives which are not

consistently compatible, through digital pathways will increasingly become an area which the heritage sector will need to resolve. For the time being, and especially during the period of Covid-19, the potential has been demonstrated for video conferencing and sharing to be a means by which aspects of the intangible heritage landscape can be maintained and made visible. Without such resources, customs might well have been lost for the want of a means of transmission of tradition.

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Section 2

Culture for the New Generation

Chapter 8

Digital Technology to Preserve Heritage Structures

Steve Hold

Abstract

Heritage masonry structures such as castles, ancient sea walls, breakwaters and lighthouses have existed for centuries but more than ever in this current era need to be preserved and quite often strengthened to be able to survive natural and manmade destructive forces. This chapter uses examples of digital technology to not only strengthen and preserve such structures but by advocating the use of the internet offers archive access to what these structures are, what has caused their deterioration and what has been done to strengthen them for future generations to see. By also using archive research into their construction in a combination with digital models of the structures the examples in this chapter show others how the use of LiDAR, drones and GPR have been able to secretly and sensitively strengthen and preserve these structures. The examples in this chapter range from a Neolithical tomb to castles and breakwaters dating from the middle ages and unique engineering examples from the UK's Victorian age of engineers. Now that these worked examples of preservation and strengthening have been stored and become available visually through the internet to those interested and working in this field by using such modern digital tools, they are now able to enter a new paradigm of Heritage preservation.

Keywords: Preserving, Digital, Record, Heritage, Monuments

1. Introduction

In the recent years, particularly since about 2010, I have been capturing and recording the significant projects that I have worked upon and been involved in either restoring, strengthening and preserving in the field of Heritage buildings and Heritage sea defence masonry structures. This usually involves repairing or strengthening these structures 'in place', often with invisible strengthening methods that minimise adding or altering the fabric of the Heritage structure as little as practically possible.

The forces at work attacking these masonry structures, particularly the sea and sometimes man-made development around the areas in which they sit, means that there has usually only been a transient focus on what was done to preserve them in the current era .. This quite often means that what was recorded for the long-term posterity is limited and minimal records being kept during the projects. The detailed information of how, why, and where the structure was repaired and strengthened is quite frequently not recorded sufficiently and the useful and critical data is often lost.

2. Digital technology to preserve knowledge of heritage structure conservation and the virtual storage of data

Since the 1990s, major projects that I have been involved with as project manager or repair works engineering designer and specifier have been recorded by progress photographs and video notes. In this way a visual and 3D record of what was done and how it was achieved has been archived. This work has now accumulated a significant archive of different types of Heritage structures and how they were investigated, repaired, or strengthened for both teaching and sharing the more innovative ideas of such sensitive repairs. The objective is then to make this recorded visual detailed information available to the current, or present-day generation of engineers or conservationists who are interested in the preservation of these types of Heritage monuments. The method of doing this in the past has been by passing this knowledge on and includes 'papers' and 'presentations' at conferences for Civil Engineering, Forensic Engineering and Heritage bodies [1]. This after many years has built up a 'legacy store' of digital data used for such presentations. In recent years the progression of technology has meant transferring all of this type of standard information usually from VHS video for projects in the 1990s to CDs and then more recently having the CD information available on hard drives in the current era. This type of data storage not only condenses a large amount of practical knowledge down into a very small space for archiving but can transfer information through the internet as required to interested parties anywhere in the world. Currently even less space for storage will be needed when storing is transferred to the next stage of archiving development in the 'Cloud' and as a by-product of 'file sharing' and 'transfer links' data sent worldwide (**Figure 1**).

Figure 1.
1. Level – Normal hard copy files of projects, investigations, and solutions. 2. Level – Information from files and VHS video takes. on to CDs. 3. Level – Information stored on files on hard drives. 4. Level – Information available from 'cloud'.

3. Digital examples of recording

For digital examples it is important to note and record what was learnt from the archive searches, how we arrived at a solution and then how it was made to work successfully on site. In this electronic archive way the methods used can be made available to various bodies of engineers and conservation societies that need such data examples and who would find it useful in the future because having worked visual examples is both very informative as well as helpful and reassuring. In the United Kingdom these worked examples and papers have been for the Institute of Civil Engineers 'Structural Faults' and 'Concrete Solutions' conferences in the main. A list of references for these is in the Citing Sources section of the Appendices, as are the selection of video material referred to in the text [2].

Most Heritage monuments are subjected to the destructive forces of nature and in particular old sea walls and breakwaters to an increase of storm duration and intensity, due to sea level rise through climate change. Also, many land-based Heritage masonry walls are subject to chemical attack from pollutants in the atmosphere, floods, and heavy rainfall. More direct human intervention forces, quite often from developers changing the surrounding environment of the building or wall is another frequent source of destructive intervention. Usually unrecognised, manmade influence is often the lack of finance leading to greatly reduced or even zero maintenance for the structure and its environment. Another more recent threat to the structures is when the personnel or custodians of such monuments change from different departments, or different governments take over responsibility and they do not provide an effective 'hand over' of knowledge for preserving the Heritage monument. Therefore, it is important to ensure that the organisation or society responsible for the upkeep of the asset has a 'virtual' record of what is currently in existence in case some future disaster should happen i.e. earthquakes, wars etc. The new custodians need an understanding of the behaviour of the structure and the strengths and weaknesses of it as well as having access to the store of archive data.

This chapter gives practical examples of using digital capture of Heritage masonry structures that can be used by those responsible for the future conversation of similar types of asset. This philosophy of digital access will also enable those who have to take over responsibility for the various, sometimes iconic, structures to be able to see what was done and where it was done in a previous similar example which was invariably under great pressures to expend a minimal cost for the maximum advantage gained for the preservation i.e. the constraints of most custodian's budgets. There are several examples where the use of digital models have helped to procure the funding for major and significant civil and marine engineering repairs such as St. Aubins breakwater, Gorey Pierhead and St. St. Catherine's Breakwater in the UK Channel Island of Jersey which has an aggressive 11 m tidal range and faces the storms from the Western Atlantic Ocean.

4. LiDAR examples of recording

This chapter therefore provides examples of how digitally capturing the whole external shape, surface and geometry of the structure was applied to examples at St. Aubins Harbour piers and Gorey Pier in Jersey where LiDAR (Light Detection and Ranging) was used to great effect. The use of LiDAR again, together with drone surveys and photo model enhancement, was used at St. Catherine's breakwater at a different part of the coast of the island of Jersey. The use of this data proved

essential in illustrating to the Government funding bodies of the Island that emergency finance was essential to save these assets for the Island of Jersey's Heritage.

From the archives search the failure of the inner face of the breakwater wall (**Figure 2**), Ref. [3] was seen to be the result of wave impact on the outside face of the breakwater causing, through 'stress propagation', the wall on the inner face of the breakwater to be forced outwards resulting in a partial collapse. The inner wall had also settled because it was originally built on the beach sand using large, loose blocks of granite stones with no foundations in 1640 by a young king Charles II. The solution shown in the model, in **Figure 3** (Ref. [3] Vid [1]), was for 'mini-piles' and 'secret fix ties' across the two granite walls of the structure which are designed to arrest any further movement.

The North Pier of the harbour at St. Aubins was also suffering from the same defects common to these old marine structures of inner wall settlement on no existing foundations that was resulting in a significant rotation inwards of the inner wall of the structure getting worse and more vertical towards the end of the breakwater [5–8]. The LiDAR survey produced the accurate model of the loose stone structure that was able to be assessed (**Figure 4**, Ref. [3] Vid [1]).

Of particular interest here was that the model moved graphically with the blue curser moving along the wall in plan with an imbedded graphic which showed the verticality of the inside loose stone wall becoming more vertical as the curser approached the end of the breakwater (**Figure 5**, Ref. [3], Vid Ref. [1]). As the original loose granite stone breakwater slopes inwards (called a 'batter'), the graphic was able to show dramatically that the further along the breakwater the inner face of the loose stones had reached vertical towards its end and was about to fail in a similar manner to the St. Aubins Fort breakwater seen in **Figure 2**. This demonstrated to everybody concerned with the maintenance of the structure that there was an urgent need to 'pin' and 'support' the inner stone wall at the end of the breakwater and tie the two masonry walls together with a 'secret fix'.

Figure 2.
St Aubin's fort breakwater failure 1972 (archives).

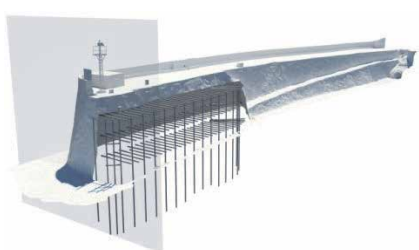

Figure 3.
St. Aubins N. pier LiDAR 3D model. (video Fly through and model Ref. [4]). (Link to video materials is available at the end of the chapter).

Figure 4.
North pier St. Aubins harbour LiDAR screenshot.

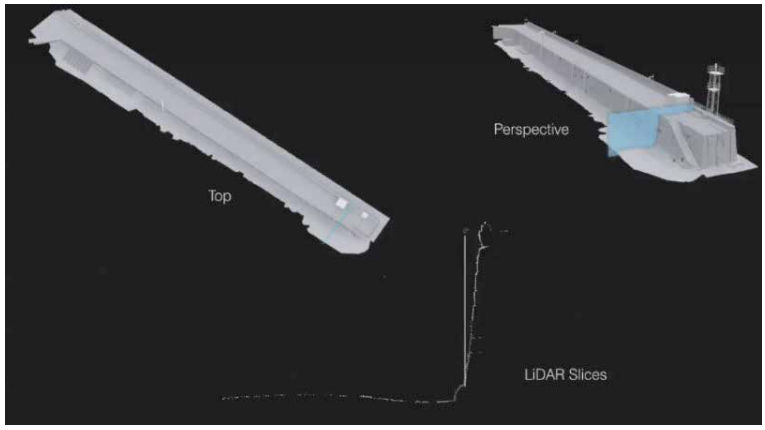

Figure 5.
Model used to demonstrate inner wall rotation of north pier. (Video of curser in moving blue cross section, Ref. [4]).

5. Digital graphical demonstrations

Similarly, Gorey Pierhead in Jersey was also saved from destruction (it also had failed in 1964, **Figure 6**, Ref. [10], Vid [1]) using LiDAR techniques to make the digital models that helped to demonstrate the need for intervention and to secure funds to enable the preservation of the pierhead of the breakwater and jetty.

Photographic merges and videos of the pierhead at low tide (with Gorey Castle in the background) showed the size of the loose granite masonry structure and where'bulging' of masonry and loss of concrete foundations were exposed (**Figure 7**). The pierhead itself show in **Figure 8** had to be rebuilt in 1964 after a major storm failure shown from the archives in **Figure 6**. To understand the evolution of the structure from the original pre-1620 pier, a LiDAR survey accurately captured the geometry of the whole of the pier in 2009. There was another major storm event in 2011 and a second LiDAR survey was taken, and the Point Cloud data overlaid on the GPS referenced coordinates of the original 2009 survey. **Figure 7** shows graphically the super imposed LiDAR scans to show where there was a "bulge" outwards of the masonry and a loss of concrete at the base.

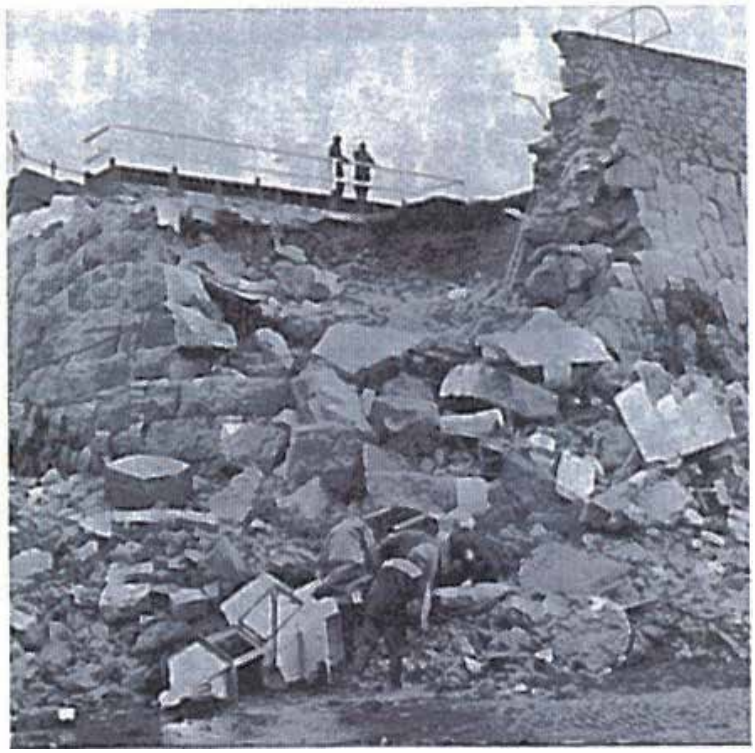

Figure 6.
Collapse of Pierhead in 1965 (archives), Ref. [9].

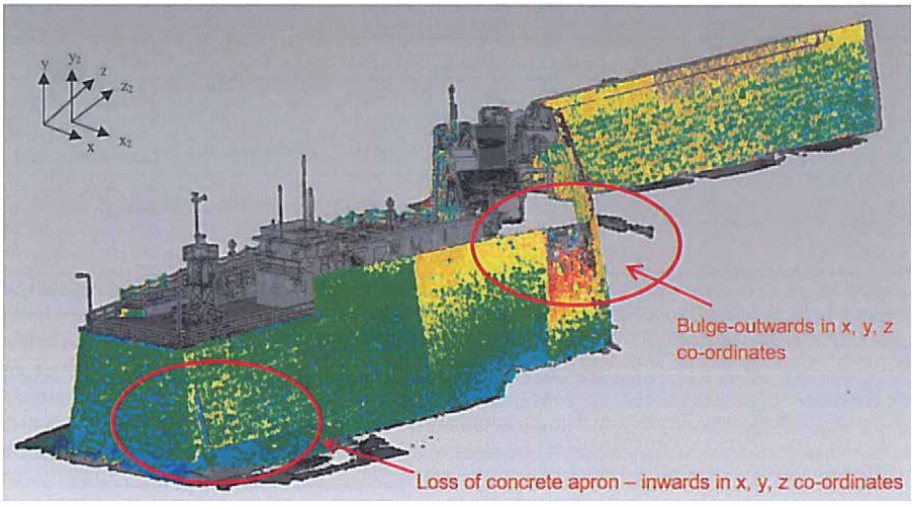

Figure 7.
Digital models overlaid 2 years apart. Localised masonry movements highlighted. Screen shot graphic colour. Ref. [9]. (Link to video materials is available at the end of the chapter).

I have used this image widely in several engineering papers and conferences because the overlay of LiDAR models (with an accuracy of ±2 mm) superimposed upon one another two years apart is self-explanatory. The second survey was directly after a severe storm and significant concerns by the structures' custodians were raised as some areas of visible physical movement had taken place. The model

Figure 8.
Gorey Pierhead and breakwater at low tide. Gorey Castle in background (digital photo merge), Ref. [10].

was able to demonstrate that one small area was 'bulging' out of the page (red in x, y, z coordinates indicates out of the page movement) and at the base concrete had been lost from the foundation apron (blue in x, y, z coordinates indicate in to the page movement). Just as importantly, the model graphic was able to clearly demonstrate that the damage was in two areas only because most of the pierhead and breakwater had remained in place after the storm (green overlay of the two sets of x, y, z coordinates have no distance). This meant that for the custodians (the Ports of Jersey) no very high costs were involved for the whole breakwater and only localised strengthening was requiring funding.

6. Photograph and digital models secure repair funds

Another very large breakwater on the island of Jersey (Jersey projects are particularly challenging because of the 11 m tidal range and adverse sea state conditions) was St. Catherine's Breakwater which stretches some 600 m out to sea (**Figure 9**, Ref. [11]). In a time of urgent crisis for the end of the structure in 2008, the breakwater roundhead was surveyed with GPR (ground penetrating radar) and found to have a very large hidden void under the concrete slab covering the roundhead at the end. If not repaired before the coming winter, then there was likely to be a failure and collapse. As soon as this occurred a section of the breakwater would have been likely

Figure 9.
St. Catherine's breakwater and roundhead 600 m out to sea.

Figure 10.
Photographic manipulation used to obtain emergency repair and protection funding, Ref. [11].

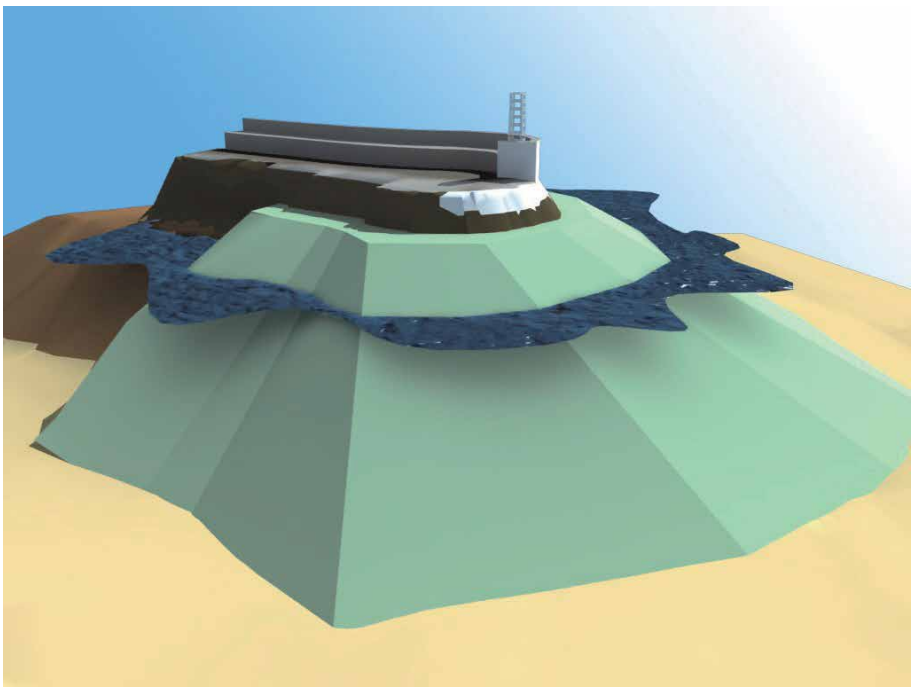

Figure 11.
Early digital model illustrating rebuild with rock Armour protection, Ref. [11].

to unravel during the type of fierce winter storms that occur around the coast of the Island. Digital models, drawing models using photoshopping images (**Figure 10**, Ref. [9]) of a likely collapse and unravelling mechanism helped to convince the governments treasury to release emergency funds. Drone surveys were then used to capture visual images of the whole structure that is particularly difficult and dangerous to survey conventionally and this also contributed to obtaining the urgent Government funding to repair and preserve this heritage marine monument as well as to be able to monitor it in the following years. (An early graphical model of the rock armour protection needed following the roundhead repairs is shown in **Figure 11**).

7. Manmade destructive influences

The deterioration of Heritage monuments due to manmade problems, for example at La Hougue Bie which is a Neolithic burial mound and tomb on the island

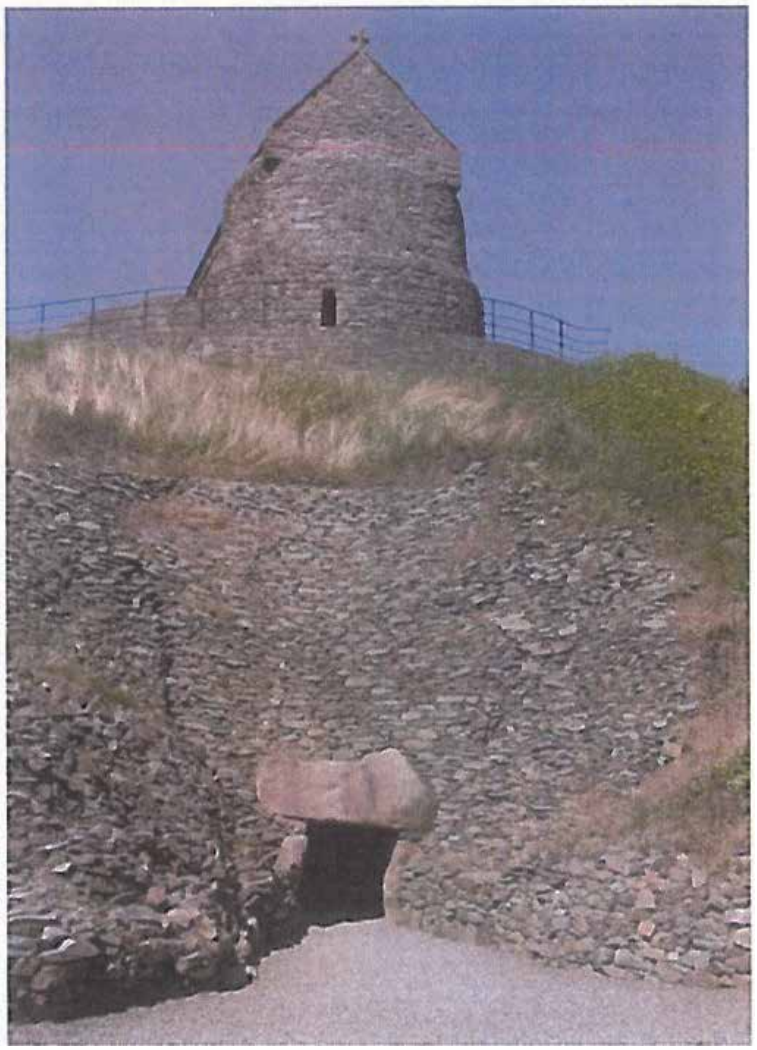

Figure 12.
LiDAR scan of burial mound entrance. Screen shot of mound entrance and film. Ref [12]. (Link to video materials is available at the end of the chapter).

of Jersey (**Figure 12**, Ref. [12], Vid Ref. [3]), also prompted a LiDAR scan and model of the whole site. In the course of recent history, trees had been planted on to the burial mound and there was great concern that the mound was slowly being destroyed by tree roots growing ever larger and into the mound. So its digital preservation for the current and future generations was recorded and the finished model has a fly-through and around the mound, as well as recording the 12th century chapel on the top of the mound (**Figure 13**, Ref. [12], Vide Ref. [3]) and even into and around the burial mound itself (**Figure 14**, Ref. [12], Vid Ref. [3]).

8. Man-made mistakes

The nearby Gorey Castle East Gate area was also damaged by manmade interventions because to accommodate tourist parking to visit the Gorey harbour and

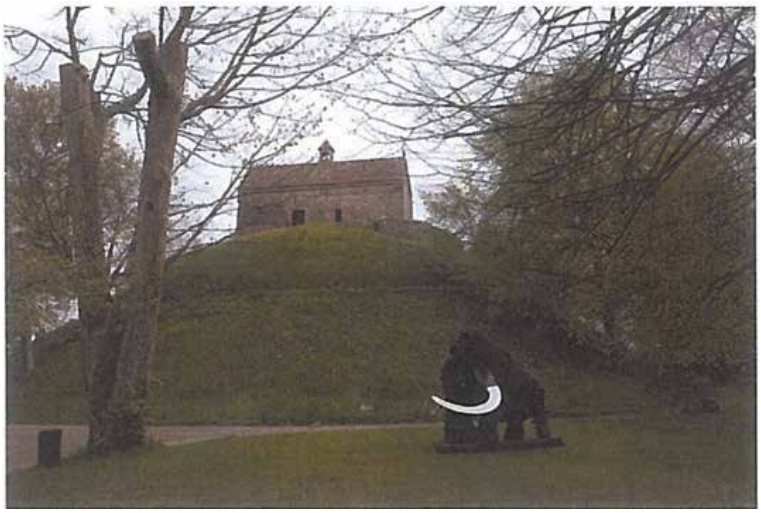

Figure 13.
Photograph of burial mound with trees (and not a real mammoth!), Ref. [12], Vid Ref. [3].

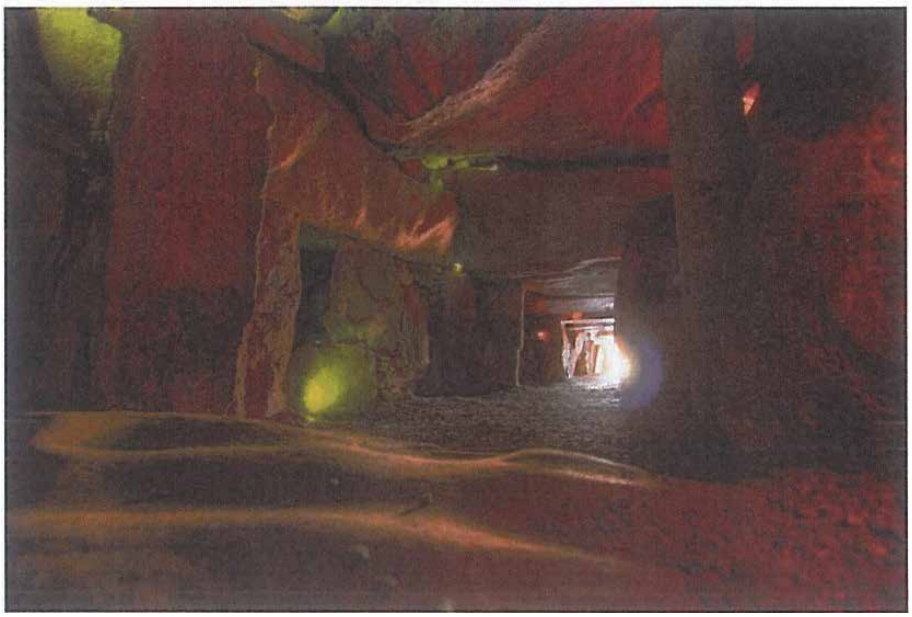

Figure 14.
Spectacular LiDAR fly through into chamber. Screen shot and film, Ref. [12], Vid Ref. [3].

Castle, excavations were carried out to create more car parking space adjacent to the Castle entrance (**Figure 15**, Ref. [10], Vid Ref. [2]). However, the works were excavated too close to the East Gate of the Castle and undermined the wall close to, and beneath this gate. The resulting movement and cracking in the masonry was significant but was also difficult to assess and map conventionally but with the use of the LiDAR model the engineering team was able to design repairs (**Figure 16** Ref. [10], Vid Ref. [2]).

LiDAR was used to accurately record the surface of the structure's masonry shape and to map the cracks so as to identify what parts of the masonry had moved

Figure 15.
LiDAR area of high density focus for accuracy. Show red line cracks.

Figure 16.
Drone survey of castle. Target area for LiDAR. Screen shots and survey video of castle, Ref. [10], Vid Ref. [2].

and by how much. This type of heritage masonry is very difficult to draw conventionally but the high intensity LiDAR scans produce accurate drawings that not only provide an archive but also very good visual records of this type of historic masonry structure and when and where it was repaired.

9. Man-made maintenance forethought

A slightly more academic exercise was carried out for the Elizabeth Castle in St. Helier because the custodians of the Castle, Jersey Heritage, required a 'resilience study' of the major elements of the Castle complex (**Figure 17**, Ref. [9], Vid Ref. [4]). In addition to a full photographic record, drone surveys were used to visually access the very high inaccessible castle walls on the rock outcrop to examine the masonry and to have a full record of the large number and variety of different era structures that make up Elizabeth Castle complex (**Figure 18**, Ref. [9], Vid Ref. [4]).

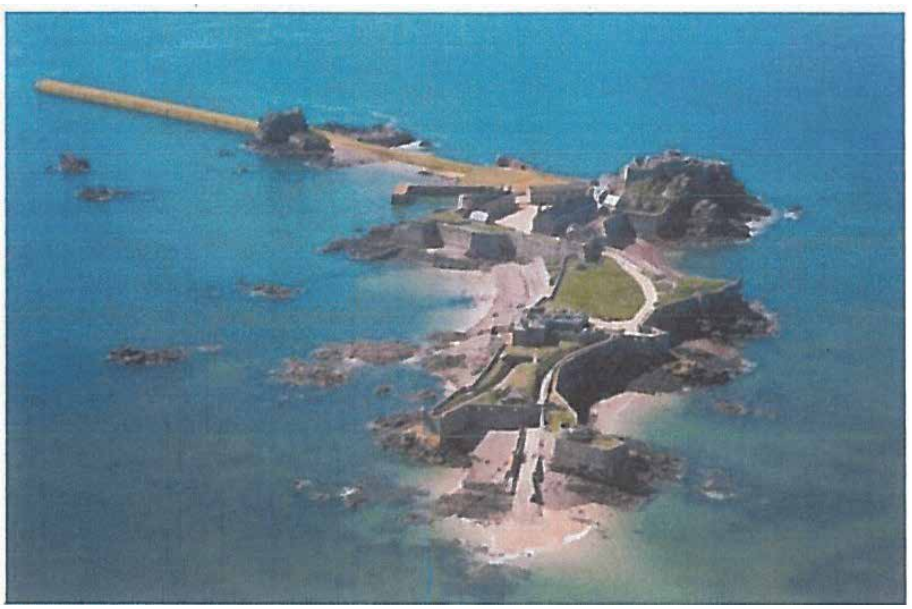

Figure 17.
The area to be scanned of the St. Helier breakwater.

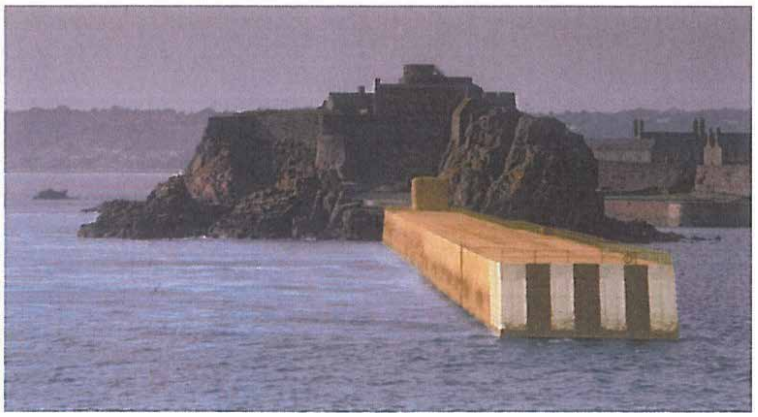

Figure 18.
Drone survey of area to be scanned by LiDAR for the Elizabeth Castle, St. Helier breakwater. (Screen shot of LiDAR castle fly over, reference video ….). (Link to video materials is available at the end of the chapter).

The Jersey Heritage Board were concerned that the annual vintage airplane display and fly past for celebrating the Battle of Britain in Jersey flew directly over the castle complex from the St. Aubins Bay in the south. The CEO of the organisation needed to know what the scale of the damage would be should any one of these ancient aircraft fall and impact on some of the priceless Heritage buildings. This included St. Helier's Chapel itself dating from 555 AD which was directly in the flight path of the display (**Figure 19**, Ref. [9], Vid Ref. [4]). The evidence from the study was then used to justify the organisers of the display in to changing the flight path away into a different direction in the Bay to safeguard the Heritage buildings (**Figures 20–22**).

Figure 19.
Helier chapel from 555 AD in the flight path.

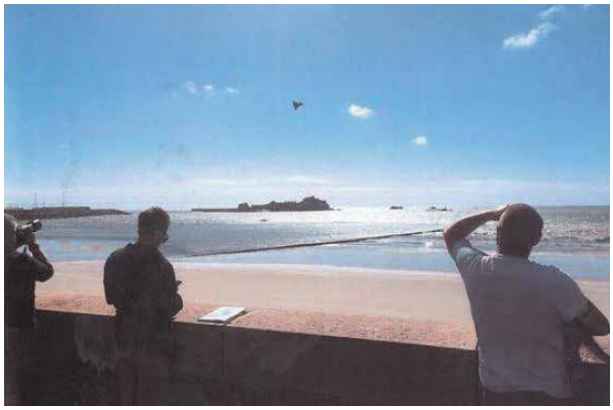

Figure 20.
From the shore the aerial fly past display over Elizabeth Castle.

10. Safety and other practical benefits of using digital technology

This type of technology, especially the use of drones to gather large numbers of images of a difficult to access part of a structure enables the production of 'Point Cloud' models with 3 mm accuracy. This methodology also means that the safety of personnel in gathering data such as at the Castle walls and the difficult and dangerous to access breakwater walls, has increased significantly. Also, distance in using this digital technology is not limited and Heritage conservation knowledge has, or should have, no international boundaries. By using LiDAR and drones to produce digital models, I have been able to work on the strengthening and preservation of several Heritage monuments in China. Examples are the Chongching Gate and the Yongying Bridge in Shanghai and the White Pagoda in Guang'an were able to be

Figure 21.
The full drone Elizabeth Castle model. The fly through over the complex is along the flight path and St. Helier's Chapel is in the centre of the picture. Screen shot and fly over.

Figure 22.
The drone survey model of the higher in accessible west facing castle walls.

assessed for strengthening and preservation using the 'secret fix' Cintec anchor method developed in the UK. Through digital communications and from exchanges of data I have been able to provide assistance in these Heritage preservation schemes. Along with the progress of Chinese modernisation and development in recent decades has come the recognition and appreciation by local Government Authorities, the community value of the Heritage monuments being preserved (**Figures 23–28**, Ref. [15]).

11. 'Secret fix' versatility

In the UK historical bridges and buildings have also had their structural integrity enhanced and preserved using digital models to work with the Cintec Anchors

Figure 23.
The threatened Chongquing gate to be preserved and strengthened.

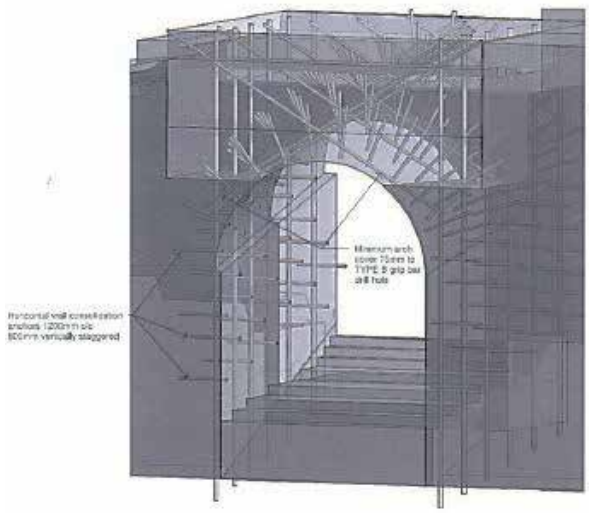

Figure 24.
The 3D model of the Cintec 'secret' anchor strengthening of the gate.

'secret fix' stitching reinforcing anchor system, as demonstrated in the St. Aubins breakwater examples in Section 4.

When modernising areas of city centers for example, façade retention has also been required in terms of Heritage and Planning to enable modern buildings to be constructed within or behind the Heritage façades. The new structure can be tied to the façade to be retained by using these methods.

12. Archive information equally important to record

An important aspect of the accumulation of the digital data work prior to commencing an investigation or study involves obtaining as much historical data from archives, drawings and records obtained from any available source. A good example recently of this whole sequential process and has been the Principal

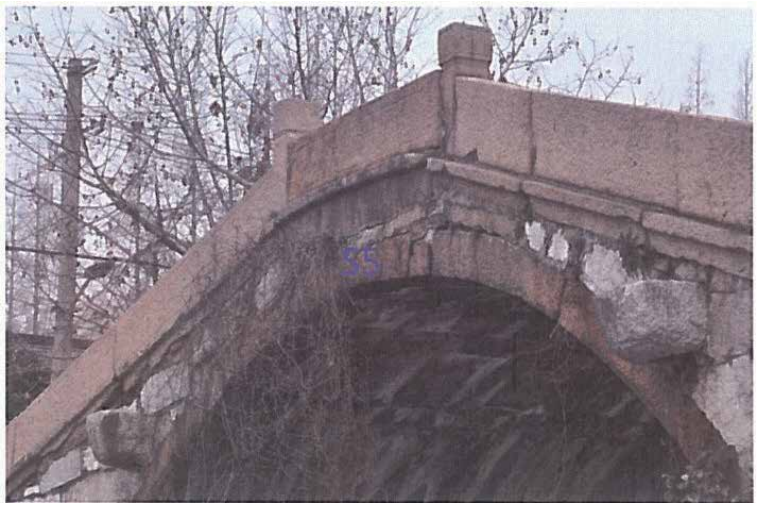

Figure 25.
The damage to the slender Yongying bridge.

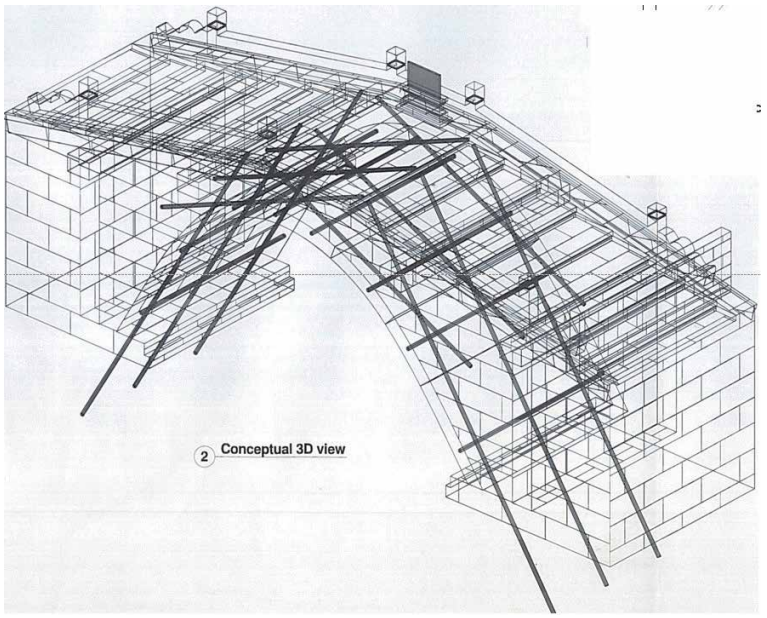

Figure 26.
3D model of the Cintec 'secret' anchor strengthening scheme.

Engineer's inspection of the Elizabeth Castle Breakwater in St. Helier, Jersey (**Figure 29**, also refer back to **Figures 17** and **18**, Ref. [9], Vid Ref. [4]).

This structure was conceived and constructed in 1860s by the English Victorian era engineer Jonathan Coode (**Figure 30**). He developed in the course of designing the breakwater a new innovative method for constructing new concrete blocks instead of using large granite stone blocks to construct the Elizabeth Castle Breakwater (**Figure 31**). It was also discovered in other archive records on the Island that at about this same time, he was able to construct the first concrete lighthouse on the island of Jersey at Corbiere (**Figures 32** and **33**).

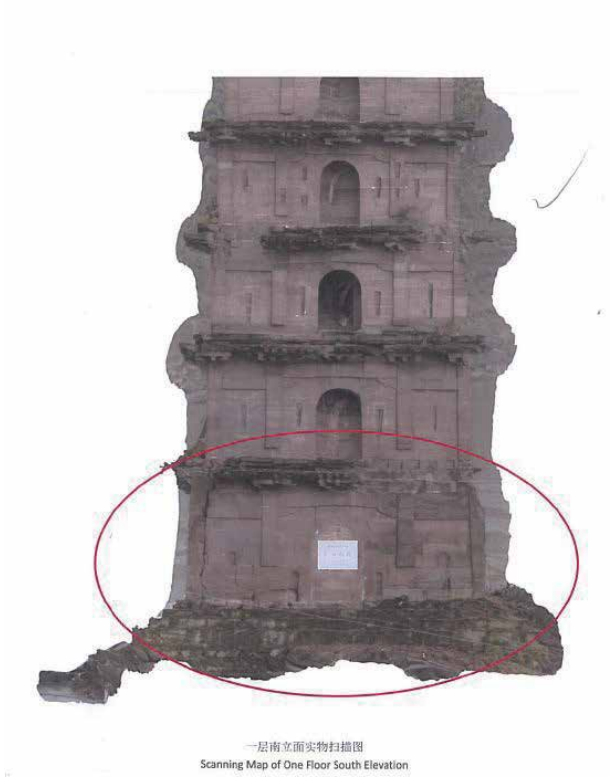

Figure 27.
LiDAR scan of the white pagoda surface erosion.

13. A unique access and records problem and location resolved by drone survey

The work to preserve and protect the lighthouse at Corbierre in Jersey (**Figure 32**, Ref. [13], Vid Ref. [5]) has also involved LiDAR scanning common archive research and drone surveys to assess the inaccessible damaged surface coatings to the very first cast concrete lighthouse erected during the UK's Victorian era in the 1860s (**Figure 33**). Access there is only gained by a causeway at low tide and is in at a very dangerous rocky part of the Channel.

14. Another unique remote location challenge

In terms of circumventing dangerous rocks and restoring Heritage value to a site, the recent work to assess and design the repairs to a sea wall at Les Minquiers, a rock archipelago 20 km south of Jersey, between the island of Jersey and mainland of France, has relied heavily upon a drone survey (**Figure 34**, Vid Ref. [6]). This particular dangerously rocky outcrop of islands forming an archipelago of unique flora and fauna is virtually inaccessible unless by light small boat (**Figure 35**). Previously there had been no surveys or any drawings done of the main island itself or the fisherman's shelter cottages that had historically been built on the island (**Figure 36**). The ability to replay and 'pause' the drone video enabled the difficult and remote access parts of the failed

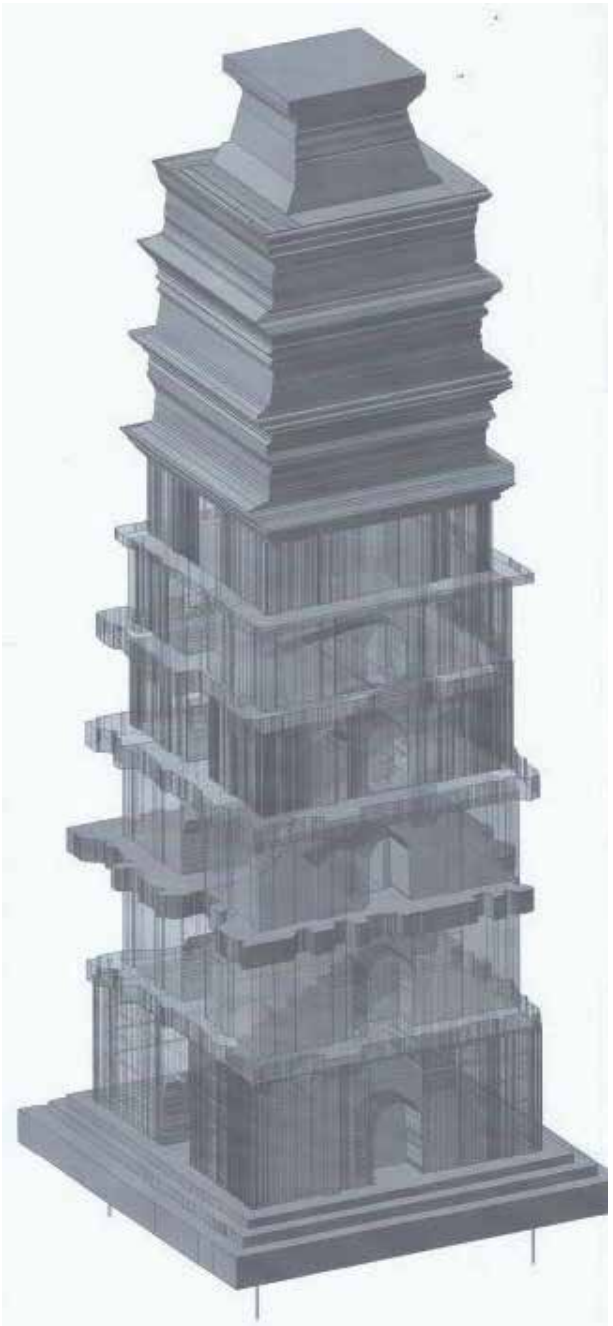

Figure 28.
Model of the structure for analysis.

sea wall to be studied and modelled so that a Heritage and environmentally sensitive repair and rebuild could be achieved.

15. Conclusion and looking forward

The issue of using digital capture has therefore come into its own in the modern era and in a practical sense to be able to 'bring back' the structure into a design

Figure 29.
The damaged west side of Elizabeth Castle breakwater.

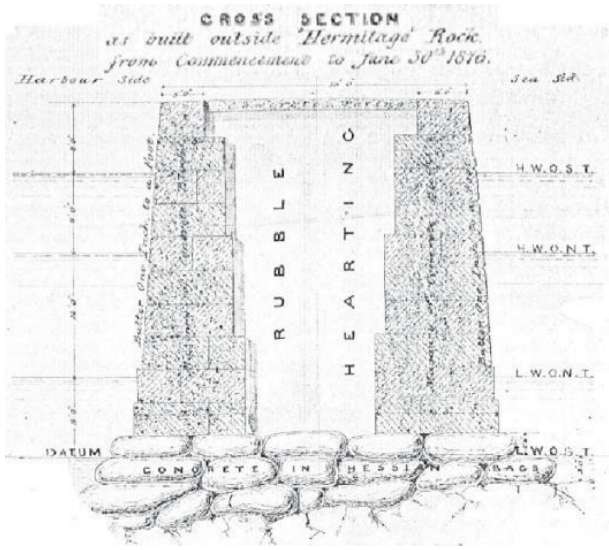

Figure 30.
Archive drawings of the breakwater's construction with concrete blocks instead of granite blocks forming the outer walls of the breakwater.

Figure 31.
Principal Engineer's report using LiDAR and drone information. Ref. [9], Vid Ref. [4].

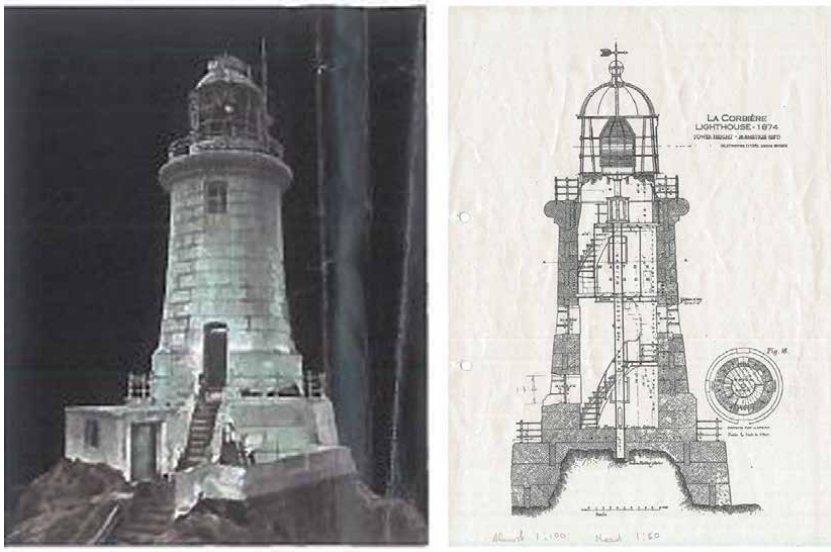

Figure 32.
Archive search of construction of lighthouse. (Link to video materials is available at the end of the chapter).

Figure 33.
Lighthouse with raging storm.

office to be able to discuss the problems and the practical methods that can be used to strengthen and preserve the Heritage structures (**Figures 36** and **37** for the sea wall rebuild at Les Minquiers is another good example).

However, the types and format of digital information and records need to be available to all and pooled together if possible and practical so that the various bodies that can benefit from using the visual experiences which has been captured. It should then be practically possible to not only pass on the technical knowledge but also provide a 'virtual record' of what was originally constructed from the archive research together with the visual records of how the site investigation and repair work was done. The data stored then remains as a full detailed record of what was done at a particular time to preserve these magnificent heritage structures for future generations to marvel at. This concept puts forward a new way of sharing how these unique structures have been assessed, repaired and strengthened and creates a new paradigm for Heritage Structural Preservation.

Figure 34.
LiDAR model of structure and later a full access drone survey of outer surface, Ref. [6]. (Link to video materials is available at the end of the chapter).

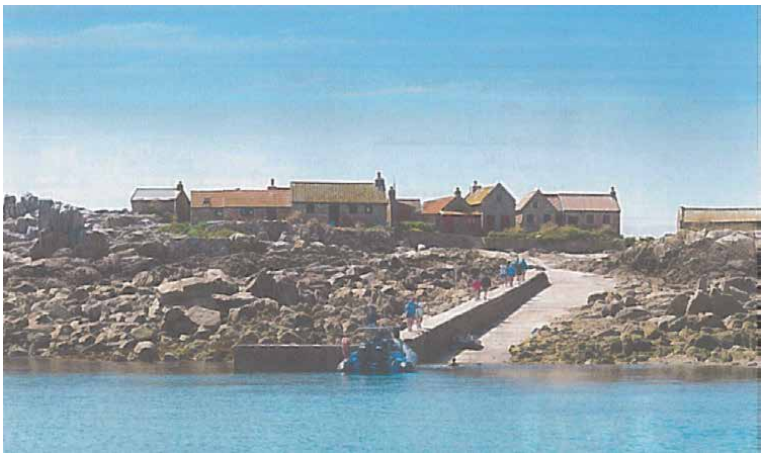

Figure 35.
Access to the island at low tide through a rock reef.

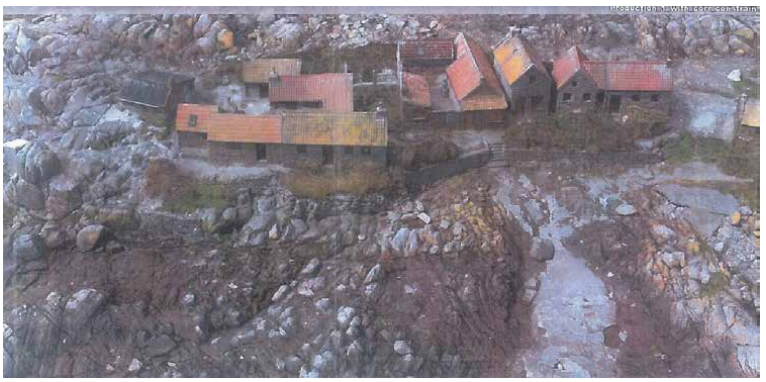

Figure 36.
Location of the damaged sea wall to be rebuilt.

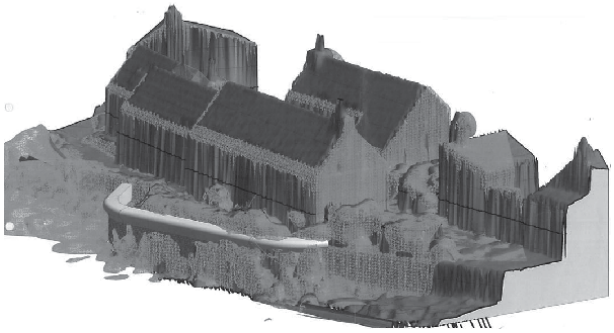

Figure 37.
Initial model helped select design geometry of sea wall repairs.

Videos

Videos are currently being edited professionally and they will be labelled and forwarded to Intech separately.

1. Jersey Fly through
2. Gorey fly through
3. La Hougue Bie
4. The Hermitage
5. Lighthouse at Corbierre
6. Les Minquiers

Video materials

Video mentioned in References [4, 9, 12] is available to download here: https://arup-my.sharepoint.com/:v:/p/bernadette_gardner/EU9S2nYdaYRDgmyaYCuGCGMBDhTI2F0LK77zEptBojrt0A?e=4gGoD8

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Chapter 9

Use of Drones for Digitization and Monitoring the Built Cultural Heritage: Indoor and Outdoor

Silviu Ioniță and Daniela Turcanu-Carutiu

Abstract

Digitizing is the way for a revolutionary approach in knowing, analyzing, continuous monitoring, and preserving the tangible immovable cultural heritage. The built cultural heritage requires the most performant means and techniques to acquire information indoor and outdoor. Drones are the best platforms for this purpose in terms of operating costs, data accuracy, and mission planning flexibility. In this chapter, we present a survey on the main applications of drones in the field of built cultural heritage analyzing the usability of this technology. Essential technical issues that are important for the operation and understanding of the use of drones in specific missions for the study of built heritage are also discussed.

Keywords: built cultural heritage, drones, digitization, aerial photogrammetry

1. Introduction

Digitization has become an ongoing goal on the agenda of economic development and social transformation. It offers a broad perspective on the very near future of humanity embodied in current paradigms such as the web-driven economy, e-government, e-society, or e-communities that are based on digital democracy and promote it at the same time. Digitization is a priority all over the world and is seen as a strategy for the profound development of all sectors of human activity. One of the most relevant examples is the program promoted by the European Commission under the slogan "A Europe fit for the digital age", which guides how digital technology is changing people's lives by empowering people with a new generation of technologies [1]. Several concepts are now circulating such as big data and cloud computing and a number of technologies such as data mining, data analytics, data fusions, and deep learning are currently used and are constantly improving to keep up with the huge production of data in all fields.

Cultural heritage is a part of data production and has been contributing to the informational treasure of humanity for millennia. The digitization of cultural heritage is only a step in collecting and manipulating data with two major purposes: storage for information preservation, respectively data analysis for the study, and advanced research. A recent European Commission report on shaping Europe's digital future focuses on 3D digitization of cultural heritage [2]. This is a roadmap for the digitization of tangible cultural heritage that highlights that the integration of data obtained through different scanning techniques is the right approach for the future. Knowledge of technologies for transforming tangible heritage objectives into data by scanning across different spectral bands and dimensional measurements,

including software components for data analysis and presentation, is very important. The digitization of tangible cultural heritage is not only a fashionable technology but a tool that tends to become a standard for the collection, preservation, and dissemination efforts of arts and cultural heritage worldwide [3]. All in all, digitization is a necessity for a better knowledge and interpretation of things, so research becomes much more efficient using data instead of physical artifacts, especially in the case of tangible real estate. Sometimes access to the physical object is impossible, or very expensive, and then, a set of data captured with the right sensors is very useful. On the other hand, data become more democratic and thus can reach the general public through the media or virtual products in the service of knowledge of cultural heritage. In fact, through digitization, tangible cultural heritage becomes digital heritage, which is a subcategory of intangible cultural heritage.

In the last decade, drones have been used in many industries such as construction and infrastructure, agriculture, environmental monitoring, mining, GIS, and so on. For all these areas, drones provide imaging data of various types: single aerial pictures, thermal and multispectral images, stereoscopic images, video content, data from laser scanning, and remote sensing. A significant number of bibliographic sources report on drone technology and airborne sensors and their specific applications and services. Most case studies are presented even by professional drone manufacturers, and a wide collection of information can be found on their websites, for example, [4–6]. A recent report on the leading manufacturers of drone technology, including their applications, can be found in the reference [7].

At present, drones have begun to be part of the arsenal of means of investigating cultural heritage, offering the possibility to fly over and supervise heritage objectives from the air, with low operating costs. In principle, they offer photogrammetry services but the applications are open to possible remote exploration and sensing tasks in archeological sites, instead of humans. An extensive and recent synthesis of the use of drones in the service of cultural heritage, including examples of applications and case studies conducted around the world, can be found in [8].

2. Drones and digitizing

A drone is an unmanned aerial vehicle (UAV) that can be remotely controlled by a human operator in a specific area of action. This type of aircraft is an excellent platform for various scanning equipment, and sensors capable of transmitting acquired data in real time, as well as its current position. Drones can provide a wide range of services, but most applications include airborne surveillance and monitoring tasks. There are drones for military purposes and drones for civilian use, but we will discuss here drones with civilian applications.

The basic mission of drones in the service of cultural heritage is to scan various objects, artifacts, sets of objects, places built of cultural interest, and using different techniques for obtaining digital images.

2.1 Photogrammetry

Traditionally, aerial photogrammetry is the science and technology of obtaining reliable information about physical objects and the terrestrial environment through the process of recording, measuring, and interpreting photographic images captured from height. Currently, digitization has extended the field of photogrammetry to the analysis and processing of images based on mathematical and geometric models with software-implemented algorithms. Automatic image processing works with huge amounts of data that drones are able to provide by mobile scanning over areas of interest.

Aerial images can be processed and interpreted in different ways. One of the most used methods is a 3D reconstruction based on 2D images. This task defines particular uses of the drone in controlled overflight scenarios, which differ from one objective to another. Another method is orthophotography through which the objectives are mapped 2D, resulting in the digital map of the objective and the area flown over with the planimetry information. These methods include geometric models and algorithms for analytical geometry. Another category of methods aims at chromatics and image illumination, which involve extracting components and color ranges, estimating specular reflection, determining ambient lighting and its interaction with materials in order to render physical objects. This is where digital image analysis algorithms take place in the visible or multispectral domain. The combination of methods, for example, orthophotography with chromatic methods produces orthomosaic maps, and by the combination with multispectral data, various indexed maps are obtained based on normalized difference vegetation index (NDVI), optimized soil-adjusted vegetation index (OSAVI), chlorophile map, or processing CIR Composite (color infrared), or digital surface model (DSM).

2.2 Laser scanning

This is a technique for directly obtaining 3D images using laser radiation using LiDAR (laser imaging, detection, and ranging) devices. Unlike photogrammetry, which is a passive method of capturing images, LiDAR is an active method that involves laser emission in the NIR or UV spectrum. Mobile laser scanning is also beginning to be accessible to drones through aerial LiDAR equipment that has evolved to meet the requirements of weight, size, and performance. Laser scanning involves technical conditions and additional requirements to photogrammetry. Knowing the position of the drone as accurately as possible at all times is crucial for the quality of LiDAR data and therefore, these systems have integrated inertial navigation sensors with very high accuracy. Laser scanning has several definite advantages versus classical photogrammetry, but it cannot surpass resolution performance, image realism, data accuracy, and ultimately the cost of photogrammetry equipment. In the LiDAR technique for each scan radius (direction) only two parameters are obtained: flight time—which is directly proportional to the distance and intensity of the reflected radiation. With this information about each scanned point, a synthetic image of the objects is built respecting their geometry with a certain precision, while all the chromatic characteristics are conventionally chosen. However, some advantages prevail for laser scanning technology: It can operate at night, in an atmosphere with clouds and smoke, and can reconstruct more precisely the surfaces covered by vegetation. Also, the time required for post-processing LiDAR data is much shorter than when processing photo images. In various applications, LiDAR technology is used in addition to the classic photo-video technique.

The drone, as a system, is capable of providing raw imaging data for the above-mentioned processing, while a suite of application software programs effectively performs the appropriate processing to extract the desired information. In fact, these are stand-alone software tools that perform advanced data processing including artificial intelligence techniques.

2.3 Technical issues

The configuration of drones for civilian use is of a VTOL (vertical take-off and landing)-type aircraft with fixed wings or the most popular with rotary wings. Here are the main component systems (subsystems) of a professional drone for civilian use:

- The structure and the propulsion engines: It constitutes a unitary assembly made of resistant and light materials in a compact and aerodynamic configuration with rotor-type propellers. The structure usually has foldable elements so that it can be stored and transported more easily.

- The sensor system: It provides data for drone self-monitoring and navigation data. On the main directions of movement, there are video sensors for detecting obstacles and measuring the distance to them and also IR sensors for detecting and telemetry of obstacles up and down. For this purpose, the drones can also be equipped with additional (redundant) ultrasonic or LiDAR sensors. Navigation sensors include the compass, the global navigation system receiver (for GPS coordinates), and the inertial measurement system (IMU) consisting of a gyroscope and accelerometers.

- The airborne surveillance system: It generally consists of a video camera with controllable orientation, but may also include a thermal imaging camera or multispectral cameras depending on the mission of the drone.

- The communication system: It contains the airborne transceiver with separate frequency channels for the remote control of the drone flight and the airborne systems, respectively for image downlink, as well as the paired transceiver in the portable remote control unit. The communication subsystem also contains a number of interfaces for data communication such as the USB port, the micro-SD card slot, and the port for connecting additional accessories to the drone (beacon, speaker, lighting projector).

- The power system: It includes the drone battery that supplies all the subsystems in the drone composition, respectively the battery of the remote control equipment.

- The electronic command and control system: It represents the brain of the drone and it ensures all the functions of the onboard subsystems such as control of the propulsion system, control of sensors, control of telecommunications, and control of surveillance equipment. The control of the major subsystems of the drone includes various parallel command and real-time control tasks such as independent speed control of each engine, stabilization of surveillance cameras, battery control, and radio power control. The brain structure of the drone is based on a multiprocessor architecture with a powerful master processor and several slave processors with distinct responsibilities.

- The remote control equipment: It is the user's portable unit—an HMI (human-machine interface) that provides the graphical control interface and the effective means of command of the drone (buttons and sticks). Usually, this role can be provided with a tablet or smartphone, but professional drones come with their own dedicated remote control unit that includes the display.

Last but not the least, a special and vital component of drones is the software system that is distributed on both components: built-in drone, respectively on the portable remote control unit. The software component actually defines the drone's brain and its so-called intelligence, effectively ensuring all the processes for its proper functioning.

Figure 1 shows an overview of the Mavic 2 Enterprise model, where the main subsystems can be identified. Full details can be found by accessing the official manufacturer's website available from: https://www.dji.com/mavic-2-enterprise/downloads

Figure 1.
Professional drone Mavic 2 Enterprise with native surveillance camera mounted in front of the gimbal joint.

2.4 Features and functional parameters

Here, we will review the basic characteristics of drones and detail the functional parameters that are relevant to the tasks of digitizing the objectives of tangible cultural heritage.

We mainly distinguish between technical characteristics and operational characteristics, the latter depending largely on the former, and together, they determine the use class of the drone, its performance, and finally the purchase price on the market. First of all, we need to understand that drone performance is the result of a technical compromise that is reflected in their operational capabilities. Current technology manages to optimize this compromise by balancing power and speed requirements versus flight distance and height, weight and gauge versus air range (maximum flight time), data processing, and transmission capability versus sensor resolution.

In general, the mission of a drone is to acquire images with very good resolution from precisely defined and very well-controlled positions. In other words, drones must provide quality digital material for photogrammetry and image processing techniques. Thus, in addition to the general performance of maximum speed, maximum service ceiling above sea level, and maximum flight time, the following features are very important: hovering accuracy range, parameters of the camera, and gimbal of camera. In **Table 1** has given selectively these characteristics for a reference model—the Mavic 2 Enterprise drone.

Considerations related to the accuracy of data collected by drones are discussed in [9]. The quality of the images provided by a drone is described by three essential characteristics [10].

1. The pixel resolution of an image is the number of pixels that make up the image. It is expressed by the number of columns and rows, such as 4056 × 3040, or directly by the total number of pixels, such as 12.3 Mpixels (4056 × 3040 = 12,330,240). This parameter is important for data sharing and storage, image display, and digital zoom.

2. Ground sampling distance (GSD), in mm/pixel, is the distance between the centers of two adjacent pixels, measured on the object observed in the image. This parameter depends on the size of the camera sensor and its actual number of pixels, but also on the distance to the photographed object. For example, a GSD of 1 mm/pixel means that one pixel per image is 1 mm in the real world. A smaller GSD means that the object will appear larger and that smaller details will be visible in the image. For example, a photo image can reach one million pixels/m^2, while a LiDAR image can only reach a few hundred pixels/m^2. Ground sampling distance is an important measure to consider for photogrammetry and measurements in images. However, GDS does not fully describe the ability to detect and characterize an object or detail in an image.

3. Spatial resolution or angular resolution describes the smallest details visible in the image. Unlike theoretical GSD, spatial resolution can be expressed in a different unit, which takes into account blur, image noise, contrast, and in general the effects of image processing: compression, denoising, edge clarity, etc. Spatial resolution is therefore a correct metric to quantify the ability to detect and characterize an object in the image. Spatial resolution is often expressed in "pairs of lines per millimeter." This unit is used to describe the spatial frequency of alternating black and white line patterns.

Technical/operational feature	**Value/limits**	**Notes**
Max takeoff weight	1100 g	
Max speed	72 kph	Near sea level, no wind
Max ascent speed	5 m/s	
Max descent speed	3 m/s	
Max service ceiling	6000 m	Above sea level
Max flight time (no wind)	31 min	At a consistent speed of 25 kph
Max hovering time (no wind)	29 min	
Hovering accuracy range	Vertical:	
	• ±0.1 m, • ±0.5 m	With vision positioning With GPS positioning
	Horizontal:	
	• ±0.3 m, • ±1.5 m	With vision positioning With GPS positioning
Parameters of camera	Effective pixels: 12 megapixels	Sensor: 1/2.3″ CMOS
	Auto focus at: 0.5 - ∞	
	Max image size: • 4056 × 3040 (4:3) • 4056 × 2280 (16:9)	Photo format JPEG, DNG (RAW)
	Video resolution: • 4 K, 2.7 K and FHD ISO Range • Photo: 100–1600 (auto), 100–12,800 (manual) • Video: 100–3200	Video Format MP4/MOV (MPEG-4 AVC/H.264)
Gimbal	Mechanical range: Tilt: −135 to +45° Pan: −100 to +100° Controllable range: Tilt: −90 to +30° Pan: −75 to +75° Stabilization: 3-axis (tilt, roll, pan) Max control speed (tilt): 120°/s Angular vibration range: ±0.005°	

Table 1.
Selected features of Mavic 2 Enterprise drone.

Finally, another photometric parameter that influences image quality is the ISO exposure value at the image sensor. Under normal lighting conditions (daylight), the exposure value is set to the lower limit of the range values and vice versa, and at lower lighting levels, the exposure value is set above. However, a high ISO value of exposure produces image noise, and a long exposure time produces motion blur when the camera moves. This reduces the image quality, and eventually the ability to distinguish small details in the image.

3. Drones in the service of heritage

3.1 Applications and methods

A survey of the latest applications of the use of mandrels for cultural heritage purposes reveals two aspects. First, there are various subdomains or particular purposes with concrete tasks where drones, as providers of digital content, prove their usefulness. Specific applications can be classified as follows:

i. Reproduction of virtual models, especially for architectural heritage, is the widest class of applications. HBIM (historical building information modeling) technology as part of BIM (building information modeling) technology is one of the most used digitization activities in the service of the tangible cultural heritage in which drones prove their effectiveness. Here, based on panoramic images captured by drones, 3D reconstruction is the most frequently addressed technique. A suite of cultural heritage virtualization projects can be viewed on the following websites: [https://www.3deling.com/heritage/], [https://iconem.com/en/].

ii. Non-destructive analysis of heritage sites and objects is an area of activity that can fully exploit the drone service in data acquisition. We mention here exterior and interior photogrammetry missions on frescoes, mosaics, upholstered surfaces, decorative stucco, and bas-reliefs.

iii. The conservation of the material patrimony requires as accurate and complete information as possible in the effective restoration activity. The reference digital models help both the restoration work and the sustainable preservation and management of the heritage.

iv. The actual restoration action can be automated and effectively driven by data by robotic interventions and reconstruction by additive techniques, such as 3D printing technology.

v. Artifact authentication is another activity that can fully benefit from the digital support provided by drones in special situations when the place cannot be explored on land or the object is in dangerous or contaminated places and when there is a risk of destroying the artifact by other types of examination.

Second, the review of recent literature reporting various applications of drones in the service of cultural heritage reveals the complementarity of several digitization technologies with that of drones, as well as strengths, weaknesses, and limitations of these technologies [11–14]. As the main technique for capturing images, traditional aerial photogrammetry has now become accessible through drones at

a very good performance-cost ratio. Photogrammetry and laser scanning are the basic techniques applicable by various methods with distinct equipment, but for the production of digital content of cultural heritage objectives, several scanning techniques are available. The main concepts frequently used in the digitization of the material cultural heritage are based on the following methods:

- Close-range photogrammetry (CRP) is considered when the subject is observed from less than 400 m either from the ground or from the air. This is a cheap and sufficiently accurate method for 3D photogrammetry based on stereoscopically associated overlapping 2D images. For aerial applications with drones, CRP is the ideal solution because the cameras have a lower weight and size, compared to laser scanners, for example.

- Structure from Motion (SfM) is a technique based on automated photogrammetry that facilitates the collection of moving images. This is the standard method for 3D reconstruction in the field of cultural heritage. In principle, it is applied within the CRP with the determination of the best overflight height and the establishment of the optimal spatial resolution, and the orthophotography acquisitions with an overlap of at least 60% are scheduled. The image collection is then processed with SfM software based on 3D reconstruction algorithms.

- Airborne LiDAR scanning (ALS) is a complementary or alternative photogrammetry technique to create a digital terrain model (DTM) or digital elevation model (DEM). 3D reconstruction of cultural heritage objectives by laser scanning with drones is becoming an increasingly accessible technology.

- Terrestrial laser scanning (TLS) is used as a basic technique or to complete the acquisition of 3D images of cultural heritage objectives with fixed ground equipment, which gives a very good data accuracy.

- Mobile laser scanning (MLS) contributes to massive point-capture technology along with photogrammetry, using LiDAR equipment mounted on land vehicles, ALS, or with handheld scanning devices. The use of this equipment involves special SLAM (simultaneous localization and mapping) technology for capturing images and point clouds in motion and real time.

In specific applications for the material cultural heritage, there are some peculiarities that influence the scanning techniques used, as follows:

i. Objects are motionless, so there are virtually no relative dynamics and images can be considered static.

ii. Some artifacts require photography from a short distance outdoor but also indoor.

iii. Indoor, natural lighting is usually poor.

iv. In inaccessible places, the real size of objects is generally not precisely known, so the exclusive photogrammetric interpretation is relative.

Interesting studies addressing the combined use of air and ground scanning technologies for cultural heritage objectives are reported in [13, 15].

3.2 Outdoor and indoor missions

We have seen that drones can be used successfully for both outdoor and indoor photogrammetry and laser scanning operations. Most applications are outdoor missions for HBIM tasks but some indoor missions are suitable for drones, in concrete situations these being the only means that can make data acquisition at reasonable cost-effectiveness. In [16], it is presented a comparative study of digitization of land surfaces, photogrammetry versus laser scanning, conducted for four types of drones. These results are interesting and useful for professionals in the field of cultural heritage. A project reported in [17] focused on HBIM for Byzantine churches in Cyprus using exclusively low-altitude outdoor photogrammetry, provides methodological details, and results obtained with a drone equipped with a 20 MP camera. In Romania, there are some important cultural heritage objectives that are being investigated by photogrammetry with the help of a drone. One of them is the large architectural monument—the medieval castle named Corvin Castle, also known as Hunyadi Castle, in Hunedoara (**Figure 2**). The other is the Adamclisi Fortress in Dobrogea, which is an ancient Roman architectural complex, today in ruins (**Figure 3**).

These applications require the planning of particular flight missions with predefined itineraries for photogrammetric capture with different viewing angles on ground objectives. Usually, two gimbal angles are used for the camera: −90°, that is, vertical downward direction, called nadiral view, and oblique direction at −45°. Practically, a methodology and planning of photography are established for each objective. The goal is to best capture the elevation of objects.

The indoor missions in the field of cultural heritage are to complete the HBIM from inside when the TLS and other MLS methods are not applicable. Recent case studies with the use of drones for visual inspection in enclosed spaces such as mine galleries, cisterns, or sewers are reported in [18]. In the case of indoor scanning missions, the drone does not benefit from GNNS services, that is, GPS signal for positioning; however, piloting the drone is done in P (positioning) mode when the vision systems to locate and stabilize itself and obstacle sensing function is

Figure 2.
The Corvin castle in Hunedoara, Romania.

Figure 3.
The Adamclisi Fortess ruins in Dobrogea, Romania.

enabled. Other indoor scanning purposes require drones hovering over the artifacts in order to capture the best image possible. In these conditions, hovering accuracy is the feature that counts, and the best results are obtained by piloting the drone in T-mode (Tripod), which makes the aircraft more stable during the shooting. An example for this use case is the inspection of the roman mosaic arts in Constanta during the expertise for restoration. This is the subject of nondestructive analysis by evaluation of the morphological and chromatic characteristics that represent suitable metrics for making decisions based on image processing [19]. **Figure 4** presents this artifact in the present condition of conservation. For a reliable analysis, quality imaging data obtained by correct photogrammetry techniques are required. Thus, for correct analysis, the images of the mosaic, as a primary source of data, must meet certain conditions from the acquisition phase, as follows: (i) to be taken orthographic shots, (ii) to be captured under uniform lighting conditions, without shadows, reflections, etc., (iii) to be taken from the same height (constant distance) for the entire interest surface, and (iv) the resolution must be as high as possible. In general, the photogrammetric method is sufficient for the inspection of artifacts such as flat decorative surfaces, so that 2D orthogonal images obtained by single shots provide all the planimetry and color information necessary for morphological and chromatic analysis. Using CRP with SfM techniques, it is possible to obtain details for DTM by estimating the deformations of the mosaic surface, the degree of degradation by erosion, and the lack of mosaic elements or the degree of intervention by adding material. ALS is not an option for scanning the decorative mosaic because an acceptable value of the GSD parameter cannot be achieved. Also, due to

Figure 4.
Ancient mosaic art in Constanta. (a) Indoor floor view. (b) Details of the artifact.

Figure 5.
Different images of the artifact.

the restriction of access on the surface of the mosaic, scanning by terrestrial means is not possible in this case. In **Figure 5**, it can be seen two shots taken manually at the arbitrary angle but also the effect of non-uniform environmental lighting.

4. Conclusions

Professional drones are actually considered UAS (Unmanned Aerial Systems), which means more than an unmanned aerial vehicle. They are equipped with specific scanning systems that define their role and operational functions. The drone is a sufficiently stable platform for close-range photogrammetry (CRP) missions and is an excellent indoor scanning device due to its small size, good maneuverability, and flight qualities. We see great potential for the use of drones for interior photogrammetry on decorative artifacts where the information of interest concerns their planimetry and chromatics. The ease of use of airborne cameras in terms of gimbal stabilizer-controlled mobility, controlled focusing, and exposure function combined with the drone's ability to hover at a short distance from the artifact gives drones high versatility for digital image acquisition. By using the auto exposure bracketing (AEB) function, for example, the camera can take several successive photos (usually three) with slightly different settings. Then, the images can be combined automatically, for example, in a single image with a high dynamic level or can be stored separately, so that the images with the most suitable appearance can be later taken from the batch.

Regarding the digitization of cultural heritage objectives, the main data are obtained through photogrammetric techniques, which in most cases cannot be exceeded in terms of accuracy and amount of data provided by LiDAR techniques. Moreover, the chromatic analysis of images can be performed exclusively by photographic techniques. Laser scanning techniques have several strengths that make them rather useful as complementary methods in digitizing cultural heritage objectives. Thus, the ALS technique generally helps in the case of infrastructures covered with vegetation and in the case of noisy photographic images when the estimation of the 3D model would be deficient.

Professional drones are becoming increasingly affordable handy tools for use in the field of material cultural heritage.

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Chapter 10

Predictive 3D Modelling and Virtual Reality of the World Cultural Heritage of Ruins of the Buddhist Vihara at Paharpur, Bangladesh

Md. Masood Imran and Miner Masud

Abstract

Generating predictive 3D modelling and virtual reality (VR) of the World Cultural Heritage of ruins of the Buddhist vihara at Paharpur, Bangladesh, is the ultimate notion of this research paper. In Bangladesh archaeology, it is a new paradigm to generate the predictive 3D models of the ruined structures in real mood and develop a VR to organise a journey from ruins mood to near to real mood. It will help to forecast the past virtually through the journey of present towards past. Futuristic forecasting is the normalised phenomenon in statistical analysis, despite the archaeologist's motto, which is to predict the past. Methodologically, philosophising the vihara architecture of the Bangla region by following Vajrayana Buddhism is the first step. Then, information technology and archaeological data enable the 3D model generation of a known structure, producing high-quality outputs of the historic site for digital conservation. Finally, 3D predictive modelling has been achieved by supporting the integrated and interactive consideration of data, established 3D modelling and VR generating tools, and the guidance of the London Charter of 2006 and the Seville Principle of 2011 for the regenerating of the cultural heritage of ruins of the Buddhist vihara at Paharpur, Bangladesh.

Keywords: digitalisation, cultural heritage, predictive 3D modelling, virtual reality, Paharpur

1. Introduction

Seven century's *Somapura Mahavihara* was listed as world heritage under the title of "ruins of the Buddhist Vihara at Paharpur, Bangladesh" by UNESCO in 1985 AD. The ruin of Paharpur Vihara is located at Naogan District, Rajshahi Division in Bangladesh. This vihara was known to the heritage residents as a hill in Bangla as *Pahar*. Because it was totally buried before archaeological exploration (1807–1812: Buchanon Hamilton, under the survey in Eastern India between [1]) and excavation in the last half of the 18th century to the first half of the 19th century. It was unfolded step by step through the excavations (1879 to 1932) [2] and visible as a vihara with a central shrine. It comes out with series of terracotta

plaques. Based on the ground plan, it has been characterised as a Mahavihara. However, a debate has been raised among the excavators and later researchers about the predictive stylistic pattern of the central shrine. The dominating ideas are cruciform style, *chaumukha* Jain temple, *Sarvatobhadra* style, and *Vajrayana* Style [3]. Nevertheless, these stylistic forms failed to predict the perspective of this shrine.

These days, there are number of software have been developed to generate 3D predictive modelling (e.g., [4]), visualisation, and digital conservation through virtual reality (VR) (e.g. [5]). It can be considered as a known to unknown journey of cultural heritage. Following the London Charter of 2006 and Seville Principles of 2011 are followed to generate the 3D predictive modelling and VR for visualisation and digitally preserve the world's cultural heritage of the Buddhist Vihara of Paharpur. The norms of digitalisation of cultural heritage have not been officially initiated by UNESCO, and ICOMOS did not ratified it by the general assembly [5]. Therefore, the London Charter of 2006 and the Seville Principle of 2011 are widely accepted to digitalise the cultural heritage, which also been followed to systematise this research.

The essence of this initiative, particularly for generating predictive 3D modelling of Paharpur Vihara or *Somapura Mahavihara* is: First, philosophising the vihara architecture of the Bangla region by following the *Vajrayana* Buddhism. Second, information technology and archaeological data enable the 3D model generation of a known structure, producing high-quality outputs of the historic site for digital conservation. And third, predictive 3D modelling can be achieved with the support of the integrated and interactive consideration of data and the guidance of an established methodology for the regeneration of cultural heritage.

2. Archaeological history of Paharpur: A world cultural heritage

Paharpur has been archaeologically identified as *Somapura Mahavihara*, the most important early medieval archaeological site of Bangladesh (see **Figure 1**) [2]. Located in the northwest part of Bangladesh in the Upazila of Badalgachi and the district of Noagaon, Paharpur is listed as a World Heritage Site of UNESCO [7]. It

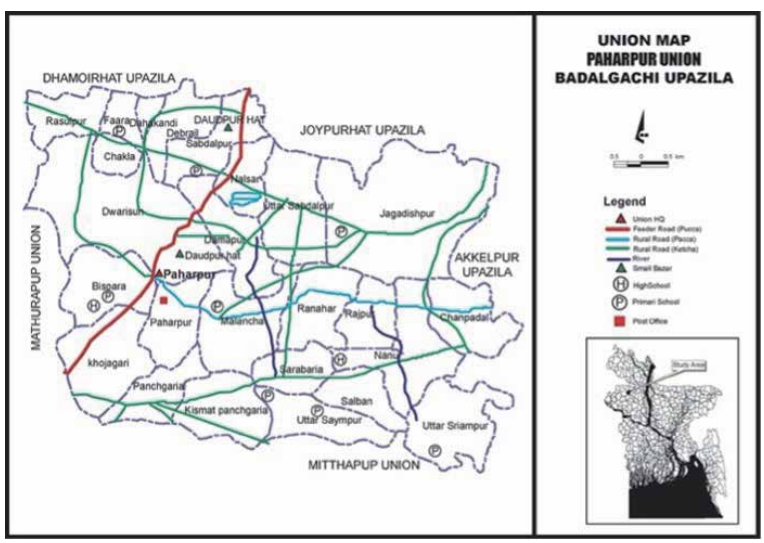

Figure 1.
Geodetic position of Paharpur [6].

also contains the great Buddist period depictions in Bangla, which is widely acclaimed along with Mahasthan, Bogra, and Maynamati, Comilla. According to Dikshit [8], a long period had already passed since it was finally left abandoned at the beginning of the 13th century. From the early 1930s, it received much attention in the historical and archaeological studies, in the selection and construction of past, in image and imaginary making project of the colonial and modern nation-state. Since it had been first excavated by eminent archaeologist Dikshit and his team in the early 1930s, this site has been re-excavated and repaired partially in phases [2].

The square-shaped Mahavihara can be seen in **Figure 2**, where every wing is 281 m in length. The Pala dynasty, notably, Dharmapala (781–821 AD), the second Pala ruler, established this *Shomapura Mahavihara* in Pharpur. There is speculation that this Mahavihara was reconstructed twice by the Pala descendants [2]. The monastery contained a thick exterior wall and two entrance provisions. These entrances were installed on the north and east wings. Each wing has continuous cells with a running corridor. Solid pedestals contain a couple of cells in each wing. The middle position of a few of the cells in three wings, except at the northern side, includes a small worship point. Except for the southern part of the monastery, every worship point is connected straight to the courtyard through the staircase. The Yantra Vajrayana styled central shrine is spatially positioned at the centre point of the open courtyard.

The central courtyard contains various small-scale and different structures such as, at the southeast corner structures, a group of five votive stupas or *panchavede*, kitchen, wells, votive stupas, a miniature architectural model of the central shrine. There is almost a lack of structures in the western half of the courtyard.

The fragments of sculptures, potsherds, ornaments, coins, seals, sealings, votive stupas salvaged are a fair number from these cultural heritage sites. From 1807, 1812, and 1879, under the reign of the British Empire, there were a couple of field explorations, and archaeological excavations were carried out by the high professional British officers, e.g., Buchanon Hamilton, Westmacott, and Sir Alexander Cunnigham [2]. They have collected so many artefacts and preserved those in Kolkata Museum in India. In addition, the Varendra Research Museum of Rajshahi preserved a couple of artefacts by Saratkumar Ray, *Zamindar* of Balihar. Akshay Kumar Maitreya was a practising lawyer and a distinguished modern historian of Rajshahi, and Rama Prabha Chanda was a prominent historian and produced art and archaeology [2]. They took some preventive measures. Paharpur was declared as a

Figure 2.
A bird's eye view of the Paharpur (Google earth, January 2018).

protected archaeological site in 1919 under the Ancient Monuments Preservation Act of 1904 [7].

In 1923, a joint excavation was started by the Archaeological Survey of India, Varendra Research Society of Rajshahi, and University of Kolkata. The excavation initiated under Professor Dr. Bhandarkar of ancient history and ex-superintendent of Archaeological Survey of India. He conducted the excavation from 1925 to 1926 in the northern part of the central mound. After his archaeological activities, KN Dikshit commenced the next session from 1926 to 1927 and 1930–1932. GC Chandra conducted excavations from 1932 to 1934. After that time frame, Paharpur became a part of Pakistan, and Rafique Mughal excavated the monastic cells of the east wings. As an independent state of Bangladesh, after 1971, the Department of Archaeology began excavations in different phases, within 1981–1982, 1984–1985, 1988–1989, 1990–1991, and 2007–2008 [2].

The clay seals revealed the historical connections among Shri-Somapure-Shri-Dharmapaladeva-Mahavihariyarya-bhiksu-sangghasya. Taranatha and other Tibetan sources state that it was built by Devapala. As the Pala rulers were devout Buddhists, an inscription on the pillar found in the central shrine was inscribed with the name of Bhiksu Ajayagrabha, who was identified with the Pala Dynasty. He was a worthy successor of Devapala. The data was crosschecked with the Jagjivanpur copperplate, where the same name was found inscribed. This can be taken as proof that the monastery received continuous patronage from the Mahendrapala. Tibetan writings, especially, *Pag Sam Jon Zang* wrote that the monastery was repaired and renovated under the reign of Mahipala from c995–1043 AD.

The Nalanda inscription of Vipulashrimitra showed that the *Somapura* as *Mahavihara* flourished around the 11th century AD. The *Vangla* army of the Varman rulers of Vanga destroyed the monastery by fire. Vipulasrimitra established a *Tara* temple and restored the former glory of the Vihara by renovation works.

3. Conceptualisation of predictive 3D modelling and virtual reality

In statistical analysis, predictive modelling is related to data mining, and it forecasts the probability of outcomes. This forecasting always depends on several predictors to understand the future move. It is a futuristic prediction format despite the archaeologist's motto, which is to predict the past. Usually, an archaeological predictive model is a map, that indicates the relative potential of encountering an archaeological site. Primarily, predictive location models were attempted to locate and identify the pattern of distribution of archaeological records. In this research, the ruins of *Somapura Mahavihara*, popularly known as a Paharpur World Heritage, are anticipated through a 3D model and generating virtual reality by using the existing archaeological and technological knowledge.

Specific initiatives were made under this study, to save the world heritage, predict the 3D modelling, and represent the world cultural heritage by VR. It is argued that digital technology is essential to visualise the unknown past for it to be known. Technologies and techniques are getting updated daily, and archaeologists may quickly grasp these valuable techniques and tools to establish their hypothesis. It is very unusual to find in situ archaeological records. In most cases, fragmented and ruined archaeological records have been dug out. In this case, typo-technology and spatiotemporal reality have only been imagined hypothetically. The 3D modelling tools help to make this virtually real. It is virtual reality that was used to visualise the predictive 3D models of ruins of the vihara at Paharpur. This structure is well preserved and renovated by the Department of Archaeology, Ministry of Cultural Affairs, People's Republic of Bangladesh.

The 3D models of the present can feature architectures, monuments, and artefacts, making it possible, to generate the predictive 3D models to aid in understanding the future-past. This paper has presented a proposal for arranging some 3D presentations of the structures of the cultural heritage. 3D modelling in archaeology is not a recent phenomenon. In fact, it has been practised for digital conservation systems and predictive modelling of archaeological objects and architectures in the last three decades. Some papers have been published in this regard. As author, we published a couple of research papers [4, 5] in this regard. It is submitted that this paper can be considered as one of the in-depth introductory research where a digital initiative has been made. A chapter of PhD dissertation has been completed on 3D conservation of cultural heritage site [3].

Generating 3D modelling of this paper is not the first attempt. Previously P.R. Myer in 1961 and M.A. Naqi et al. in 1999 published two papers where they tried generating 3D modelling of the central temple of Paharpur Vihar. Myer and Naqi both have imagined the ruined structure central structure as a stupa. Developed the idea by following Nalanda and Pagan stupa architecture, and Naqi et al. characterised the structure based on the Hindu temples of Eastern India and Ananda Temple of Pagan. They failed to be philosophising the structure. They tried to follow the ground plane to erect the rest of the ruins and tried to compare the style with the nearby references of the stupa.

The purpose of the 3D modelling of *Somapura Mahavihara* is to revisit the logical historical predictive explanations. K.N. Dikshit compared *Somapura Mahavihara* with a four-faced *chaumukha* Jain temple, i.e. Guhanad Jainvihara in Arhats. S.K. Saraswati tried to compare it with a *Sarvatobhadra* style of the temple [9]. Ali Naki and his team compared the style with that of *Barabudur* and *Angorkot* Temple, regarding structural, morphological similarities, and they developed the first 3D of *Somapura Mahavihara* [10]. Seema Hoque and M.M. Hoque explain the stylistic and teleological comparison with the *Vajrayana* Style. Basically, for generating the predictive 3D model of *Somapura Mahavihara*, a logical understanding of the *Vajrayana* style was necessary; and to determine the monumental architecture, the *Vastu Purusha Mandala*, discussed by Kautilya, was taken as the stylistic

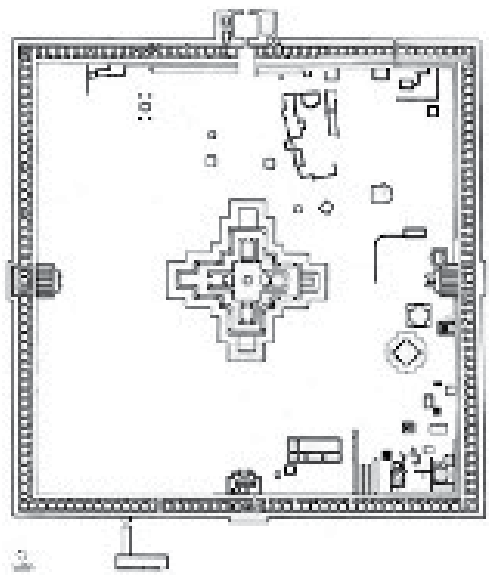

Figure 3.
The ground plan of Somapura Mahavihara, Paharpur [8].

background [9]. The study of the ground plan of the central shrine of *Somapura Mahavihara* (**Figures 3** and **4**), shows that this *Mahavihara* may have belonged to the *Yantra Vajrayani* theology. Because of this ground plan of the central shrine of *Somapura Mahavihara*, which is published in the excavation report by Dikshit [8]. The sixtythree sculptures are noted in every corner of the basement (**Figure 5**). Along with only one Buddha sculpture, there were other sculptures of Hindu deities (e.g. the Yamuna, Krishna and Radha, Indo, Brahma, Siva) which were recorded.

Vajrayana introduced the polytheism theory of five *Dhyani* Buddhas as embodiments of five *Skandhas* or cosmic elements. The five cosmic elements are: *form* (*Rupa*), *sensation* (*Vedana*), *name* (*Samjna*), *conformation* (*Samskara*), and *consciousness* (*Vijnana*).

In *Vajrayana* mythology, the five cosmic elements are given anthropomorphic forms as *Pancha Dhayni* Buddhas. Each *Dhyani* Buddha is one aspect of the *Sunya*. These are *Vairochana*, *Ratnasambhava*, *Amitabha*, *Amoghasddhi*, and *Akshobhya*. According to *Vajrayana* philosophy, these five *Dhyani* Buddhas are placed in five directions, i.e., *Vairochana* is in the centre, he is always placed in the sanctum of the stupa, *Amoghasiddhi* at the north, *Ratnasambhava* at the south, Amitabha at the

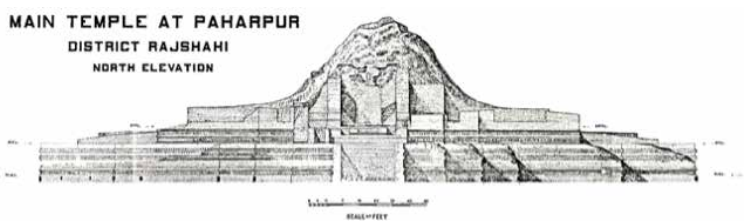

Figure 4.
2D model of Somapura Mahavihara *generated by Dikshit [8].*

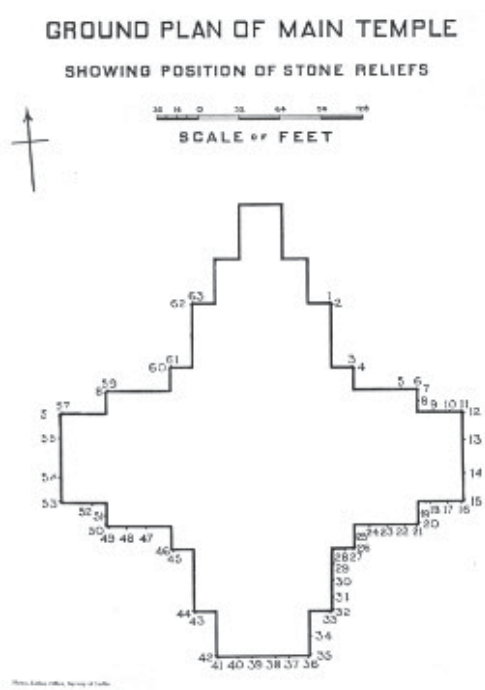

Figure 5.
Ground plan of the central shrine of Somapura Mahavihara *[8].*

west, and *Akshobhya* at the east. The **Figure 6** is showing the *Garbhadhatu* mandala, is representing the *Vairocana* Buddha surrounded by eight Buddha and bodhisattvas (clockwise from top: *Ratnaketu*, *Samantabhadra*, *Samkusumitaraja*, *Manjusri*, *Amitabha*, *Avalokitesvara*, *Dundubhinirghosa*, *Maitreya*.

As a Structural Principles for Generating the 3D Model of Mahavihara, here the basic principles of Vastu Shastra are applied in constructing buildings, i.e., residential buildings, commercial complexes, industry layouts, towns, temples. The Vastu Mandala always follow five basic principles, which are: *Bhu Pariksha* (Examination and Selection of Site), *Dik Nirnaya* (Orientation), *Padavinyasa* (Planning of various component), *Manna* and *Ayadi* as Proportion and Measurement of building, and *Bhulambamana* or *Chanada* as the aesthetics of the building.

As an archaeological structural reference for generating the 3D model of the central shrine of *Somapura Mahavihara*, which is a Bronze votive stupa from the Ashrafpur (**Figure 7**) [11] and Shallban Vihara (**Figure 8**) [13]. These evidence also represent the same kind of structure, a bell-shaped stupa in the centre and images of Buddha facing four cardinal points in the niches having *Bhadra* type of superstructure. T.K. Biswas [14] mentioned that near Paharpur vihara is Tara complex, conceded several votive stupas. However, these days, those votive stupas references have not been found in the register. If we go through the Easter Indian votive stupa references, there are a couple of examples that might complement the conceptual framework of the central structure of Paharupur, which are Saranath (**Figure 9**) and Bodhgaya (**Figure 10**). These references could be a replica of the evolved form of stupas constructed in the 7th century onwards. This type of replica was also found from various Buddhist sites at Mainamati during excavation.

Philosophising the Bangla regions' Buddhism and understanding the existing vihara structure to negotiate the prediction of *Somapura Mahavihara*. Here archaeological evidence has been referenced to justify the negotiation of Predictive 3D Modelling. Technologically a journey has been set from AutoCAD for 2D drawing to

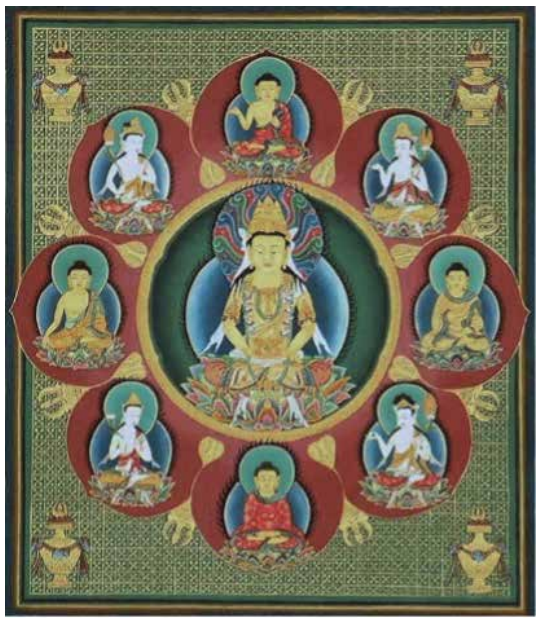

Figure 6.
Garbhadhatu mandala (de.wikipedia.org/w/index.php?title=Datei:Mandala1_detail.jpg&filetimestamp=20041210200904).

Figure 7.
Bronze votive stupa, Ashrafpur [11].

Figure 8.
Bronze votive stupa, Shallban Vihara [12].

Figure 9.
Votive stupa from Saranth [14].

3D Max for 3D modelling, and then Mudbox, Unity3D, Adobe Photoshop, and Illustrator are used here to finalise the VR. Generating the 3D modelling and VR project have been negotiated in two different ways. First one, the existing ruins of Vihara of Paharpur has been generated, which can be considered as known to know journey and the final project is predictive 3D modelling, which can be told as known to predictive journey.

4. 3D model of surviving structure of central shrine of *Somapura Mahavihara*

To generate the Predictive 3D modelling and VR of *Somapura Mahavihara*, it is important to develop the 3D Model and VR of the remaining structure. Warfare also caused the cultural heritage safeguarding by a transnational agency like UNESCO as a world patrimony. Then, the first UNESCO convention has occurred in 1974. These days, the world entered the horrific blood-shedding. Religious, ideological reasoning to trigger this destructive setting and found the cultural evidences as an ideologically conflicting entities. These have been destroyed by shelling. Subsequently, natural disasters (e.g., earthquake) caused erase the human creative genius of archaeological evidences permanently. Therefore, London Charter and Seville Principles are initiated to conserve and safeguarding the cultural heritage digitally. The

Figure 10.
Votive stupa from Bodhgaya [14].

basic principle is to preserve the existing structures without add any changes. It is a known to know journey to save and visualise the cultural heritage digitally. The following **Figures 11–17** are generated based on the existing structure of Paharpur Vihara or *Somapura Mahavihara*.

5. The final outcome of the predictive 3D modelling and VR of the central structure of Paharpur Vihara

Going with the aforesaid logical background, the following predictive 3D model has been developed. Shown here is the ground plan to develop the structure morphologically using the *Yantra Vajrayana* Mandal as the ideal to erect the predictive 3D model of *Somapur Mahavihara*. Specially the top structure has been generated based on the votive stupas, which have been discussed in previous section (**Figures 7–10**). According to structural engineering, the arch-like technics

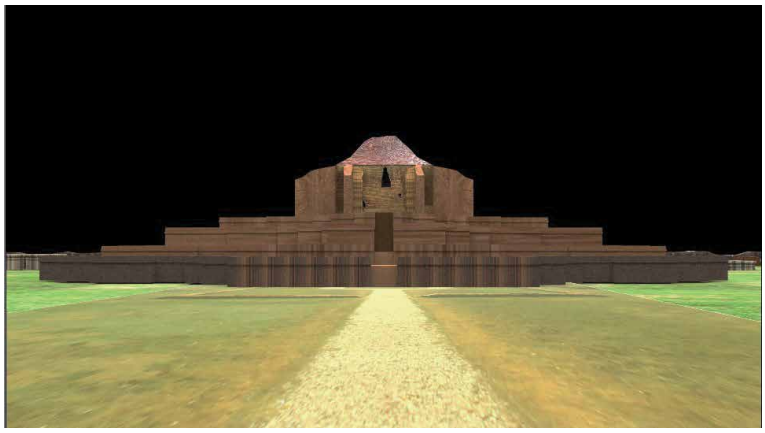

Figure 11.
3D model of the front view of the resent structure of Somapura Mahavihara*, Paharpur.*

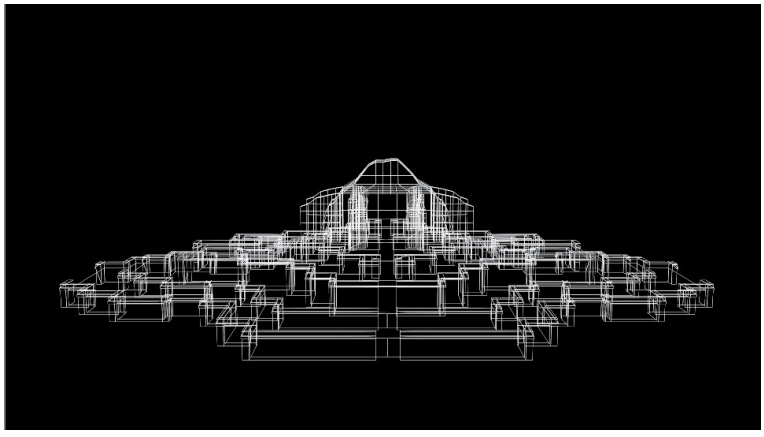

Figure 12.
Ware frame for generating the 3D model of the central shrine of Somapura Mahavihara*, Paharpur.*

Figure 13.
Long view of the 3D model of existing Somapura Mahavihara*, Paharpur.*

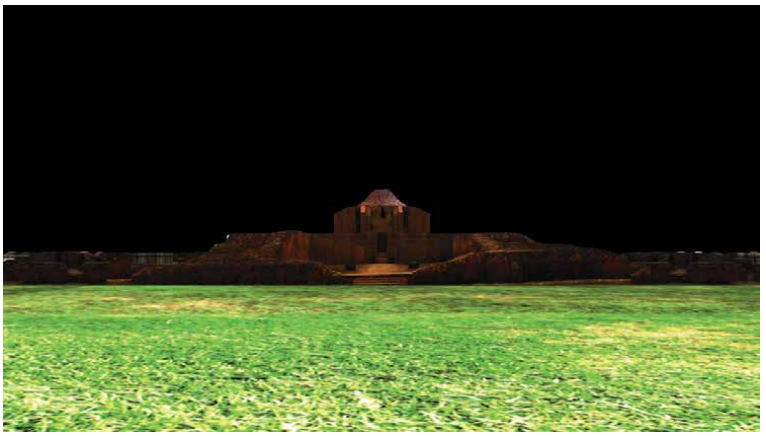

Figure 14.
Close view of the 3D model of Somapura Mahavihara*, Paharpur, with central entrance.*

Figure 15.
Mid shot of the central shrine of the Somapura Mahavihara*, Paharpur.*

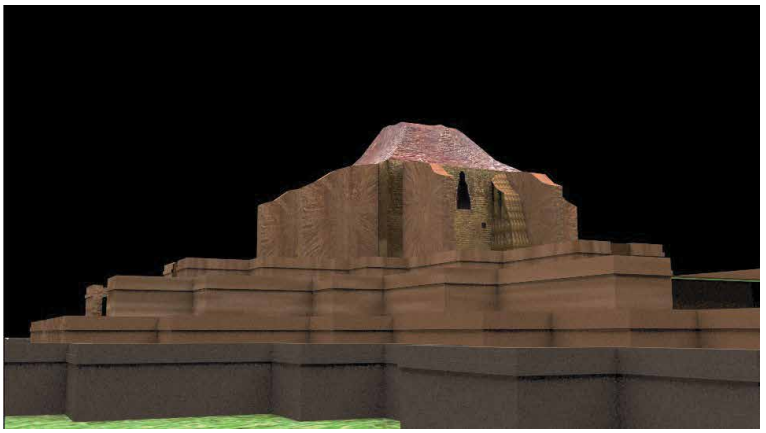

Figure 16.
Partial close view of the central shrine of the Somapura Mahavihara*, Paharpur.*

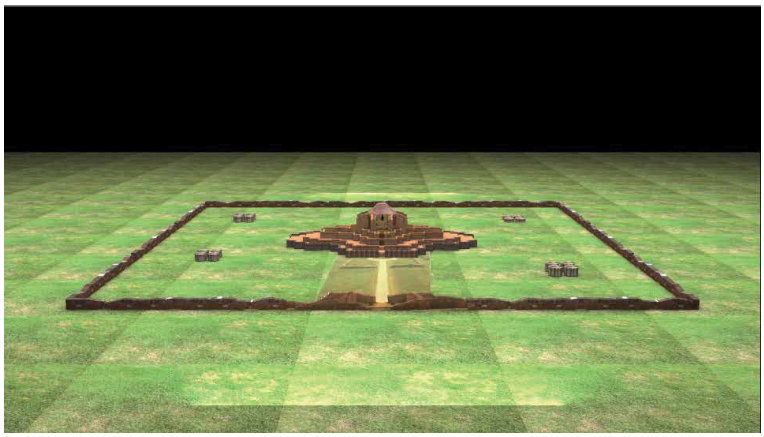

Figure 17.
Top view of the 3D model of the Somapura Mahavihara*, Paharpur (source: The author).*

corbelled method has been massively followed. It is the spanning of a space or void of structure. Particularly to support the superstructure roof, here corbelled techniques have been used. There are several small-scaled corbelled arches (**Figure 18**) have been found after excavating the paharpur [8]. By following the ground plane and existing vertical central structure, the prediction of 3D modelling has been generated in the paper. The logical framework of this modelling has been following the *Vajrayana* Buddhism, which elaborated in the previous section of this paper. The outcome of the predictive 3D models and VR of the central structure of Paharpur Vihara or *Somapura Mahavihara* is following below (**Figures 19–26**).

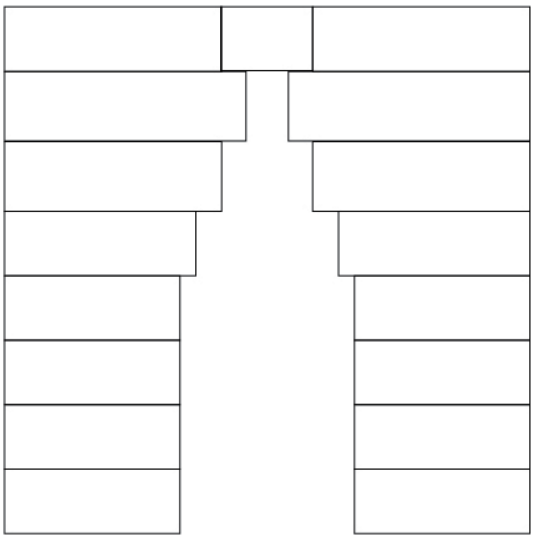

Figure 18.
Design of corbel arch.

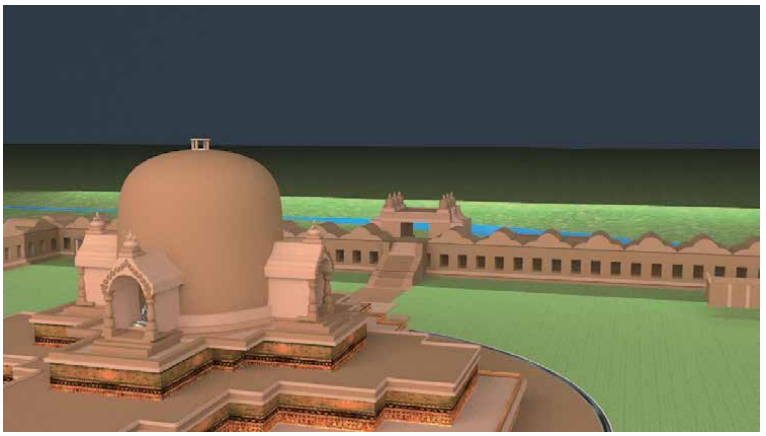

Figure 19.
Partial view of predictive 3D model of the central structure of the Somapura Mahavihara*, Paharpur.*

Figure 20.
Partial top view of the predictive 3D model of the Somapura Mahavihara*, Paharpur.*

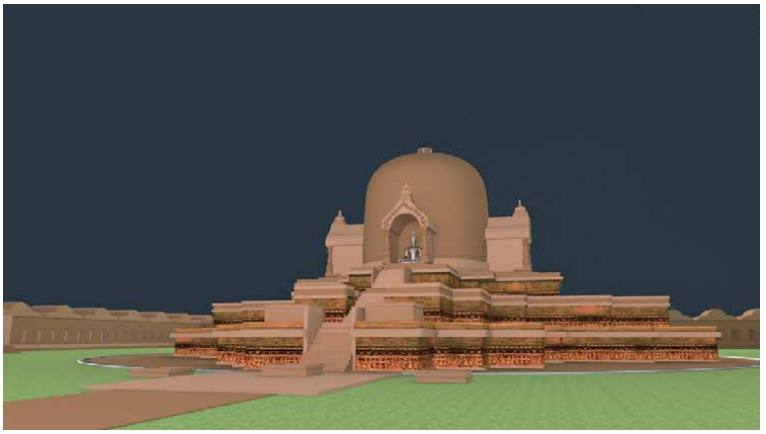

Figure 21.
Front view of the predictive 3D model of the central shrine of the Somapura Mahavihara*, Paharpur.*

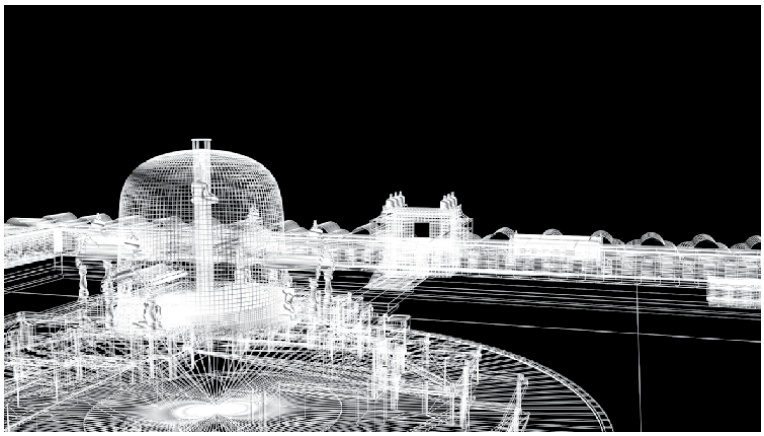

Figure 22.
Ware frame of the central gateway of the predictive 3D model of the Somapura Mahavihara*, Paharpur.*

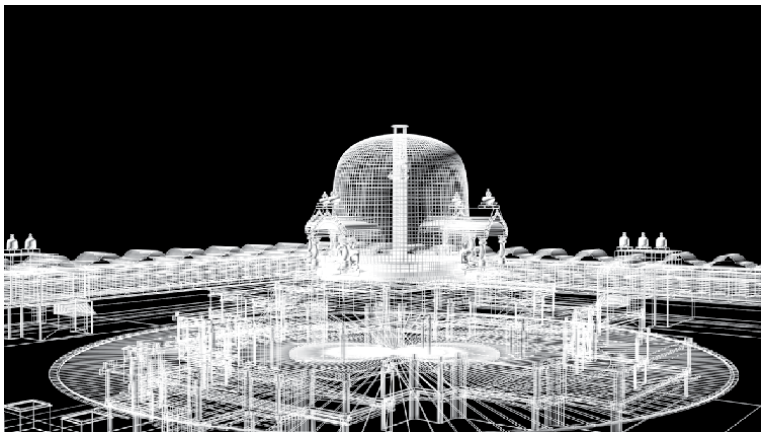

Figure 23.
Ware frame of partial view of predictive 3D model of the central shrine of the Somapura Mahavihara*, Paharpur.*

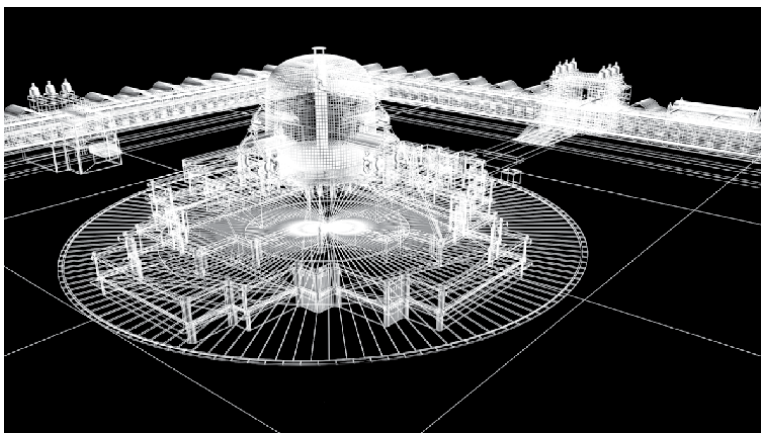

Figure 24.
Ware frame of the horizontal view of the predictive 3D model of the Somapura Mahavihara*, Paharpur.*

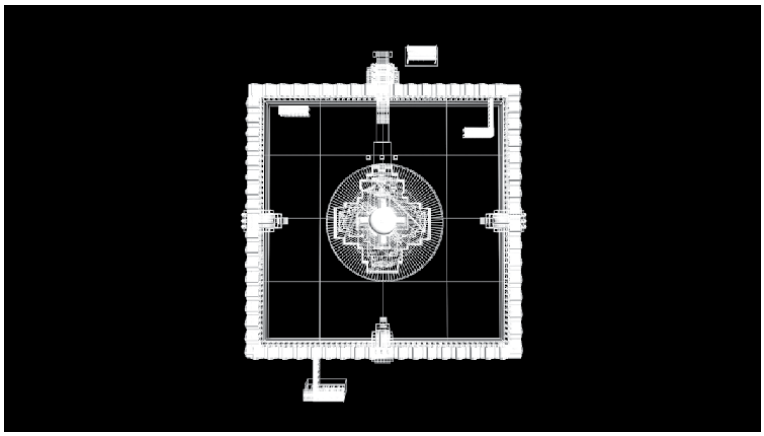

Figure 25.
Ware frame of the vertical view of the predictive 3D model of the Somapura Mahavihara*, Paharpur.*

Figure 26.
Top view of the predictive 3D model of the Somapura Mahavihara*, Paharpur (source: The author).*

6. Conclusion

Vajrayana Buddhism philosophised the yantra mandala style of vihara of Paharapur in this paper, and structurally Votive Stupas, notably, Shallbanvihar, Ashrafpur, Saranath, and Bodhgaya phenomenally characterised the superstructure of this vihara. The discovered Votive stupa belongs to the Vajrayana Buddhism. The **Figures 19–26** are the logical interpretation of the Vajrayana style. Meanwhile, a question has been raised inquiring into the real necessity to regenerate these structures virtually. The answer is: yes, it is vital for a better understanding of accuracy and preservation capability. A case in point is the predictive 3D modelling of Paharpur Vihara has been generated on the idea of Yantra Mandala and the central shrine predicted on the notion of Vajrayana. Heritage sites are continuously exposed to threats such as weathering erosion and anthropogenic erosion, and especially, the problematic safeguarding mechanism [15]. Therefore, it is necessary to conserve the Paharpur Vihara or *Somapura Mahavihara* digitally and visualised by using VR.

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Chapter 11

Cyber - A Digital Cultural Heritage in a Museum and University Setting

Ladislav Župčán and Martina Župčánová

Abstract

In recent years, we have registered for the professional and lay public several published scientific and popularization papers on the use of virtual reality in cultural institutions, especially from abroad. The applicability of the components of virtual reality at present is not only dependent on the technical or economic nature, but also on the degree of mutual teamwork forming the basic framework of the project. The presented study consists of a theoretical nature in the context of the analysis of museum virtualization with an impact on positive and negative use in practice. The purpose of the practical section is direct examples of use in practice with a connection to the educational environment.

Keywords: museum, virtual reality, cyber-exposition, online exhibition, source

1. Introduction

The instinct of the collector and exhibitor has been present in man since the earliest phase in the form of cave paintings and sculptural art in the form of Paleolithic and later Mesolithic Venus. This trend of preserving and expanding the "art of past generations" took place in all subsequent periods and centuries. However, it gradually manifested itself as an attribute of preserving and documenting the authenticity of time through objects.

Today's exhibition language is the product of a combination of current knowledge of science and exhibition practices, knowledge and needs of the visitor of the 21st century. Among the priority needs for visitors to a modern museum is not only to learn about collection items, but also to examine them in detail, e.g. try them, touch them, or make a true copy of them. At present, the needs of visitors can be saturated with technology in the form of 3D printers, as well as the direct craft creation of castings of selected collection items.

Alternatives to adapting modern cyber technology are almost limitless; from visual presentations (from educational aids such as PowerPoint, Impress, Kyenote and others) to the technological creation itself (eg. software - graphic reconstruction of monuments and collection objects, 3D shapes and forms of architecture of cities using 3D printing, or 3D Puzzle of world cities and cultural heritage and others).

Today we can no longer talk only about the form of "help and finding solutions to problems" but it is necessary to create modern procedures (online presentation of

field results associated with video calling, practical adaptation of acquired theoretical knowledge into practice, for example when researching issues using a virtual archive, verification of architectural knowledge in constructed 3D and XD virtual monuments, and the like) in combining the acquired knowledge with technological advances.

2. Methodology of the study

The research samples were selected according to the following basic factors:

- Constant and stable attendance of selected institutions.
- The scope of digitized collection items and the degree of execution of virtual reality.
- Necessary economic stability (eg. the largest state support) and cooperation with the private sector, which helps to create alternative exhibitions in the form of a virtual presentation.
- Marketing and advertising promotion.
- Multimedia education and interactive research of collections for practical purposes [1].

Based on the above criteria, several national and specific museums of diverse character were documented (according to the typology: artistic, historical-patriotic and ethnographic), which applied elements of cyberculture as much as possible (2014/2015–2019/2020).

The priority of the research was to analyze the following pitfalls using comparison, area diagnostics, psychological and axiological methods:

- Virtual interface of the museums website (eg obtaining clear information, degree of online interaction, etc.).
- The impact of visual design on the visitor or his need for self-education and relaxation.
- Invoking an emotional experience from a selected exhibition and presentation.
- Empirical experience in demonstrations of the application of virtuality (an effort to understand collection items and today's technologies).
- Inducing renewed interest in visiting selected museums.
  Register of cultural institutions using elements of virtuality, resp. virtual reality is geographically and technologically diverse. The main criteria in compiling the list of museums for the study that apply cyberculture to their prepared programs were:
- Combination of classic and virtual exhibitions. A key factor is the degree of diversity in the design and adaptation of digital collections.
- Offer interaction on the web, even in classic spaces.

- Use of virtual and multimedia elements in the advertising presentation of the museum. It goes e.g. about the use of 3D videos. This includes design promotion based on the use of technical innovations such as. handheld scanner.

- Experimenting with interactive components of cyberculture during the tour, such as e.g. tablets, audio-guide devices and others.

- Presentation of development stages of the application of technical innovations in the interpretation of their collections in the form of pilot projects and short-term exhibitions.

- Applying more demanding components of cyberculture (eg holograms) to the exhibition process.

3. Deepening the exhibition plans of museums with university practice

From the very beginning, museums have promoted the idea of providing new facts to those who intend to broaden their knowledge horizons. Such an example are the collections from the 2nd millennium BC. from the city of Larsa for didactic purposes. It is education and the acquisition of new knowledge that play a key role in the creation of museums and their collections. This moment intensified at the turn of the 18th and 19th centuries, when the foundations of exhibition plans for the realization of expositions were laid.

At present, we can prove the existence of three exhibition plans:

Syntagmatic plan. The plan was created in about 1750, depending on European countries. When visiting the exhibition, the social status of the visitor was important in the given period, as well as his education. The change in the exhibition plan came only after 1950, when some of the artifacts were made available to the public freely. The syntagmatic plan represents a diverse complex of collection objects, which are directly set in the display case, in the pre-planned space. According to this plan, all collections should be displayed in display cases or plastic structures.

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Associative plan. The plan creates a multi-colored non-linear form of presentation in a directly reserved space [2]. We can also declare this state on the idea of I. Maroevič that "the gradual professional elaboration of a museum object leads to the reduction of ambiguity (museal indefiniteness) through more detailed knowledge, which is presented through communication levels" [3]. M. McLuhan also drew attention to the associative plan in the sense of communication in museums in 1967 when creating expositions [4]. The author stated that the exhibition collections should be exclusively without descriptions, so that the visitor participates in the interpretation of the facts. This thesis was refuted in the following years, but nevertheless in the last twenty years, its basic idea in the form of virtual exhibitions has come to life again [5]. In the associative plan, the education of visitors plays an important role in understanding the interpretation, social status plays a marginal role, as museums are accessible to everyone. This condition is currently visible even at the free entrances of some museums every first or last Sunday of the month.

Visual-virtualization plan. The plan began to be used in museums at the turn of the 20th and 21st centuries. It is related to the gradual establishment of the idea of "self-survival of values" obtained from the visit to the exhibition [6]. On this principle, a new digital exhibition language was created. In practice, the scheme is based on the purposeful intervention of the visitor in terms of his initial interest. The digital language is directed through several channels and gradually penetrates the consciousness, with an effort to maximize the expansion of the museum's virtual reality.

The basic contours of the visualization-virtualization plan are:

Direct transformation of digitized collection objects into an exhibition hall. For the visitor, this means moving the collection from the cognitive to the emotional level. Depending on the technical level, the collections are still available in digital form in an innovative form. This example is also for collections that have not yet been made available to the public. Thanks to virtual reality, visitors can explore collections from almost any angle. Collectibles performed in a virtual form do not form the exhibition unit itself. In most cases, digitized objects are presented with authentic collection artifacts. As a suitable example, we can mention a part of the collections scanned by a 3D optical scanner from the Slovak Mining Museum in Banská Štiavnica. From a foreign environment it is e.g. permanent exhibition from the National Museum of Rome (Thermae Diocletiani) or from the Archeological Museum of Naples (Museo Archeologico Nazionale di Napoli).

Creation of expositions to historical events that have not yet been processed and presented. In addition to historical contexts, scientific topics also resonate. Various visual reconstructions in the form of static models or film simulations are used to achieve the step. Animations can also be linked to interaction. These attributes provide access to current scientific knowledge, which also revitalizes older claims. An elaborate example of this type is the permanent online exhibition called "Keys to Rome" [7]. Several museums collaborated on the exhibition, e.g. Museum dei Fori Imperiali from Rome, Allart Pierson Museum from Amsterdam and more. The exhibition has been open to the public since September 2014.

By creating various technological constructions depending on the design of segments of museum cyberculture. In this step, there is an effort to elaborate the exhibition themes in more detail. As a result, attempts have been made to restore old exhibits. Archival documentation is used to achieve the output process. A good example was the 3D exhibition of the most important Italian Renaissance paintings located in the Louvre Museum. E.g. Using the Nintendo game console, the 3D Mona Lisa came to life, clipped lashes, nodded, waved, but also answered questions in seven languages. This exhibition was created using the Nintendo console, and visitors did not even have to wear special glasses to create a 3D image.

Creation of virtual exhibitions and interactive collections that are not located directly in the museum. In this context, some museums use the so-called multimedia XD digital objects as well as museum holograms (eg Dubai Museum and Al Fahidi Fort: متحف دبي - صور الماضي) to show historical stories. Since about 2013, we have also registered exhibitions using nanotechnologies (eg the Museum of Science in Boston) or directly robots (eg the Robot Museum in Madrid), in which current technological knowledge is applied.

4. Cyberspace - museum (cultural heritage) - university (virtual education)

Life in society has changed a lot in the last 50 years. Undoubtedly, this is also a consequence of the technology that, with the advent of classic television sets, was

already creating a ramp to gradual virtualization. This was most evident in cinematography. Virtuality is one of the basic forms of cyberculture, which is "generated through fiction and illusiveness in confrontation with mimeticism, emphasis on identity in terms of ideal presentation and the existence of what is otherwise impossible, inaccessible, and brings a permanent deal with the degree of expression, disrupted to hyperreality and superficiality... " [8].

However, we can not understand virtualization purely as a way of visual presentation, [9] as it is a fundamental phenomenon of network, so-called cybercommunication. From a sociological point of view, virtuality is an epistolary genre, [10] that is, writing on the screen, not on paper. This type of writing is mostly used for communication, especially on social networks and e-mail.

The development of science and technology in the field of communication and information means has opened up new, previously non-existent spaces. These spaces are connected by relatively large geographical distances, it is possible to move in them and create virtual communities. The current consumer population is adapting space and time, even discovering and explaining the importance of connecting borders. In this spirit, J. Pašiak sketched the basic scheme of spatial trends, forms and types of society, which in the course of historical development reacted to the then technological boom [11].

Similar views arose from the technological and economic predictions of many authors (eg. D. Bell and H. Kahn), [12, 13] who emphasized the evolutionary model of post-industrial society. A. Toffler also predicted in 1968 that the main "feature of cyberculture" would be "work from home", performed using a computer connected to a telecommunications network [14]. These predictions led from industrial and urbanized space to cyberspace and virtual networks. This transformation of processes represents a global trend and is characteristic of the civilizational component of globalization [15].

In the context of globalization, cyberculture has strengthened certain boundaries and barriers between the various strata of society, such as:

- Between people who have access to information and people without access.

- Among people who can work with new technologies and among people who do not have the necessary knowledge to use technology.

This trend is also applied in museums and galleries through museum digitization and elements of virtual reality, especially with regard to virtual reconstructions and high technology [16]. The purpose of museums is not only exhibition activity, but also the formation of public opinion of the past. Contemporary museums are exposed to a compromise between authenticity, the display of original museum collections and virtual pomp in the struggle for their existence. This situation is primarily influenced by the website and the degree of presentation of digitized collections to the public via the Internet, which has its supporters and opponents. A significant shift in information and a cross-section of traffic was also ensured by Google's computer application. Google Corporation has launched a project called "Google Art Project" to unite selected world museums with art and graphics in a virtual environment using the Internet [17]. The revolutionary idea was to create a list of the best virtual museums in the world according to certain criteria. The criteria were e.g. virtual museum with the best exhibition activity, the best application of virtual products, animation-virtual stories (scenes), interest of visitors, etc. The list of museums is expanding every year and even new applications are being created in the project with the basic intention of attracting visitors to the museum premises. Currently, the leading position in Google search traffic per weekly click

belongs to the French Louvre. The museum currently has the most detailed elaborate graphic design and interactive interface. In addition to the interior, the virtual tour also offers some of the floors of the museum's exterior.

In other leading places in the ranking were placed museums, such as Smithsonian Institute: Museum, NASA Museum or Virtual Museum of Canada, etc. A rather specific virtual museum is the NASA Museum in Washington. The museum has an animation-interactive page. The robot in the role of a guide accompanies the virtual visitor through the history of the American national space program. The virtual museum is complemented by original, authentic materials from the archives, photographs and various audio / audio samples.

The museum with the largest number of existing virtual exhibitions so far is the Virtual Museum of Canada. The virtual museum operates on the basis of a grouping of physical museums from the territory of Canada. So far, 752 virtual exhibitions have been constructed. The most interesting presentations within the exhibitions are considered to be cartoons in 2D and 3D and profile cities. Individual cities are processed in a virtual form. It is possible to follow their historical-architectural development, or contemporary local sounds from factories, neighborhoods, cars, etc. It should be noted that the latter museums are located exclusively on the Internet.

The basic forms of museum cyberculture include digitization, internet communication, cyberspace, virtual reality and online presentation. Defining the concept of museum cyberculture is complicated for several reasons, such as non-uniform terminological bases, absence of elaboration of methodological procedures in analysis of impact of digitization and virtualization of museum artifacts, different execution of virtual reconstructions on the basis of technical complexity and lack of financial and marketing promotion [18].

From the museum practice, the most used elements of cyberculture are the digitization of museum artifacts and the internet presentation of the museum, the so-called virtual tours [19].

Although digitization is a relatively long-term matter in terms of time and technology, it is gradually becoming established in the pedagogical environment. We can observe the greatest manifestation in the creation of digital and multimedia laboratories directly at universities or in the museum sphere. In addition, the digital - visualization trend also affected the educational process. Nevertheless, various forms of application of the components of cyberculture prevail among individual departments (as well as universities) for the benefit of research and interpretation of knowledge. This fact is also noticeable in the Slovak Republic, where it is necessary to improve the usability of digitization and work with virtualization in the university environment. Compared to other, comparable countries (eg Poland, the Czech Republic or Hungary), this situation is considerably underestimated in our region, which is also reflected in the acquisition of European projects or the success of graduates with digital experience in obtaining employment.

In several humanities and social sciences, the adaptation and dissemination of technological innovations (eg the use of tablets, smartphones, Tesla's transformer, etc.) is currently the most prone in the field of visualization elements. The basic task of virtualization is the presentation and verification of theoretical knowledge in real form. It is visual practice that documents other research alternatives from other scientific disciplines.

Currently, the following scientific phenomena are the most preferred:

- creation of reconstruction models of existing collection objects in order to present them online as a promotional item, as well as for available study (eg the Digital Museum project, which is under the patronage of the SNP Museum in Banská Bystrica).

Figure 1.
Example: Life and works of Galileo - a virtual 3D survey [21].

- creation of various collection items (most often damaged or stolen, processed on the basis of preserved documentation) using 3D printers.

- making available reconstructive museological exhibitions of historical and social themes in universities (eg "Virtual Exhibition of Slovak Castles" at the University of St Cyril and Methodius in Trnava, or "History of Scotland" at the University of Glasgow.). In this regard, it should be noted that most foreign universities (eg, the University of Denver, the University of Maryland, and many others) focused on the study of history and architecture on their official (department) site offer direct virtual exhibits.

- construction of an ideal virtual form of cultural monuments (especially ancient and medieval buildings: sacral and profane buildings) in a digital format for the study of the history of architecture.

- virtual animated demonstrations and feature films about individual historical periods. They are mostly 2D, or. 3D examples documenting the social conditions of the time [20].

- virtual geographical and cartographic plans and maps created using technological and navigation systems (eg GIS).

- creating simple educational presentations (**Figure 1**) using multimedia tools (eg. virtual book) to simplify and explain historical - socio - cultural processes for high school students (especially grammar schools) and universities.

5. Cyber - artifacts and cultural heritage

In the way of studying and interpreting the nature of complex historical processes and their connections as a whole, implementation using individual virtual elements is increasingly present on a global scale. Important promoters of virtualization include, in particular, German, Anglo-Saxon, Francophone and

Sino-Japanese university experts, who apply forms of virtualization and cyberspace in the analysis of the history of the human population.

This situation manifests itself in several patterns (eg from short clips to rehearsal and repetition alternatives, etc.), which are accessible to the public, especially in the online interface. In the educational process and especially in the interpretation of the history of architecture, especially in the presentation of building changes in urban planning and differences in the architecture of monuments, we can consider the following forms as decisive elements:

- 2D to 3D virtual reconstructions of various cultural monuments included in the then cities (**Figure 2**). These forms are based on sources of archeological provenance and also on architectural and historical graphic documents.

- cartographic, geographical virtual plans and floor plans of the then cities. (**Figure 3**). Virtual maps as well as books are based on the geography of the time and preserved maps.

- static and virtual reconstruction models of cultural heritage (layout of buildings, natural attributes, as well as period sounds). Knowledge from the

Figure 2.
Example: 3D castle Slanec [22].

literature and previous graphic and sound analyzes play a significant role in the creation. A typical example is the exhibition at The Virtual Museum of Canada (VMC), which documents one of its exhibitions of the social changes of selected Canadian cities from the 19th and 20th centuries through old photographs and period sounds (**Figure 4**) or he - line exhibition of the floor plan of the city of the Manhattan district from 1812 to the present (**Figure 5**).

- reconstructions of the then portraits of the most important figures, which changed the character of the history of cities (eg kings, statesmen, architects, etc.). Selected reconstructions are created mainly with preserved artifacts (eg. sculptures, busts, paintings, graphics, photographs and others).

Today, there are a relatively large number of professional websites on several Internet browsers that visually process the history of individual European and non-European cities. Nevertheless, no website (with the exception of the National American Archive with its own virtual museum) offers the online user historical [26] and factual interactions (except for pre - stored facts and graphic recordings). Almost all websites lack the alternative of creating and documenting the history and visualization of cultural artifacts.

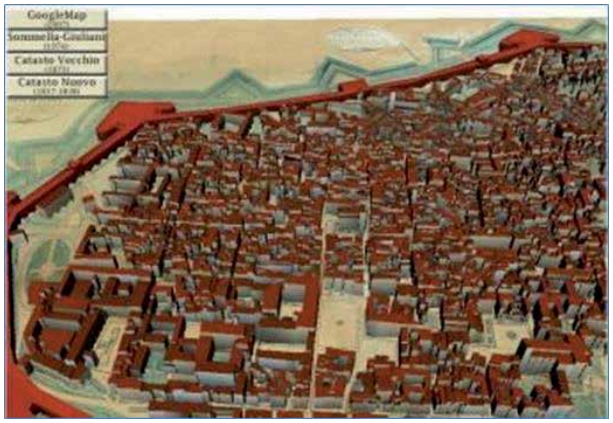

Figure 3.
Example: 3D floor plan of the city of Lucca [23].

Figure 4.
Sample: Exhibition entitled "Urban Life Through Two Lense" at VMC [24].

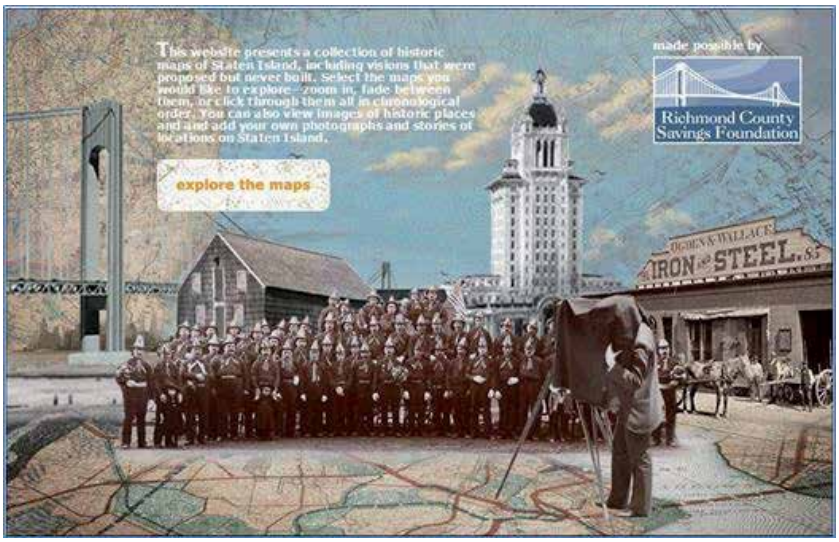

Figure 5.
Sample: Online exhibitions of Manhattan Island history [25].

6. Virtual museums and contemporary pedagogy

Virtual museums are created with innovative technology and represent the most modern virtual and didactic models. Their purpose is to ensure current marketing progress, they are part of an entertaining, but mainly educational digital - virtual space, where we can move, walk, respond to stimuli and gain certain knowledge [27]. The authenticity of visual - virtual objects and artifacts in a cyber exhibition depends on the processing and application of current technology. The originality of a virtual object is not always static, so it is necessary to approach it broadly, as it has the dimension of the original objects and we can not talk about copies, but illusions or even reproductions of missing articles that directly create a visual experience, but many times do not correspond to the original objects. and thus create hypotheses of the selected object, the artifact [28].

The virtual museum represents a hybrid concept [29] of a physical museum with digital flexibility of technological and technical equipment, while it has alternatives such as:

1. Digital collections are independent of physical artifacts.

2. Digital exhibits can facilitate the purchase distribution of replica sales, thus creating an effort for non-violent marketing and promotion of a cultural institution.

3. Digital exhibits can be used in another digitization process.

4. Digital, but especially virtual exhibits can be applied in the pedagogical process in several dimensions.

These alternatives are intended to support the diversity of the use of virtuality, from websites to virtual cyberspace. 2D and 3D exhibition (not to mention the application of anaglyphs, holograms, but especially the so-called augmented reality in the presentation process) serves as a tool for education and assistance in

solving other research hypotheses. The aim of the virtual exhibition is not only the creation of virtual space, respectively. Cybercocks, but especially the spatial rendering corresponding to the real state of the monument or artifact in the relevant historical decade.

Impact of museum virtualization [30].

Among the positive elements we include:

- in the long run they are lower costs,
- exhibiting other collection objects and objects not in the given museum,
- association of museums due to mutual cooperation and creation of joint projects,
- virtual reality is more personal than ordinary means of communication such as e-mails or social networks,
- virtuality has socio-sociological significance regardless of language, age and gender,
- the virtual reality community forms a whole without the influence of the geographical environment,
- virtual reality helps to more effective and productive communication between individual scientific disciplines,
- each individual can find their own territory of interest,
- the space of virtual reality offers complete free communication with the world.

Among the negative elements we include:

- lack of personal contact with collection items,
- hypothetical conclusions of newly created objects,
- loss of radiation and radiation from original collection items,
- restriction, even loss of social life and erosion of interpersonal relationships,
- virtual interaction gradually replaces social communication and discussion in the public,
- greater socio-property differentiation in society and increasing industrialization of everyday life,
- the virtual environment provides the risks of various hypotheses,
- virtual reality in some cases brings worthlessness, even insignificance of personalities, leading to destructive features,
- deterioration of the health status of users, especially the possible occurrence of ophthalmological, mental and neurological disorders.

7. A few words in conclusion

We can observe urban changes in culture in several spheres, but especially in the way of perceiving art and presenting cultural heritage. Today, it is no longer enough for visitors to present facts, as was the case in the past. It is necessary to process the overall context and create a diverse art and life of previous generations. Cyberculture components can handle this attribute.

We can also observe a fundamental change in the influence of cyberculture in museums, when documenting in the form of exhibition, educational and scientific activities. Cyberculture in the presentation and protection of cultural heritage can modify the basic emotional elements that affect human organs to such an extent that they evoke the impression of infinite space. The artificial virtual world, in which the human visitor feels without limitations and boundaries, is created with the intention of direct participation in the cyber world. Existing virtual exhibitions have created certain standards for the presentation of artifacts and individual themes.

This situation can be reflected from the opening of exposures to cyberspace at the turn of the 20th and 21st centuries. It is the openness of free cyberspace that creates new types of presentation of cultural monuments and artifacts to the public. It is one of the globalization trends taking place in museums and monuments. With the help of accessible cyberspace (eg. virtual tour), every potential visitor gets the opportunity to look at the world's cultural uniqueness. Year-on-year, European archeological sites (eg Pompeii, Herculaneum, Lasaux Cave, etc.) as well as American natural curiosities (eg Grand Canyon or Niagara Falls and others) will receive the most "clicks". Adherents of cyberculture also welcome the application called "Live" as a positive side, t. j. live broadcast from relevant sites. In recent years, this trend of a lively, current environment has also been applied to the largest cities in the world, or tourist sites. Most of the world's museums and galleries already have a similar treatment. It should be noted that negative attitudes prevailed among the conservative group in making the cultural heritage accessible in the cyber world.

At present, the mentioned phenomenon is supplemented by a new technological element, i.e. j. 3D reconstruction of ideal forms and shapes of existing cultural monuments. This type is mainly used by important tourist regions (eg. 3D Ancient Rome, 3D Louvre, etc.) using portable audio- guides.

The phenomenon of cyberculture is an extraordinary component of the presentation and its possibilities are almost limitless. For this reason, a wider application would be needed in the humanities, which lags behind the technical sciences. It is only up to the researchers of the humanities which direction their future will develop and what position they will build in the university environment.

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Chapter 12

Reflectance Measurements on Cultural Heritage

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Abstract

Cultural heritage is a valuable and characteristic symbol of every country. It should be handled with care and it must be exhaustively investigated and measured with non-destructive techniques. In this chapter, we will talk about different reflectance measurement techniques to obtain the conservation state of the artwork. With this reflectance characterization, conservators, and curators could soon determine the best maintenance procedures for restoration purposes. Also, a new technique for lighting will be discussed, where the artwork can be also photonically restored illuminating with the correct light in the desired area of the artwork using a spectrally selective projection system.

Keywords: reflectance measurements, non-destructive, characterization, virtual photonic restoration, artwork, cultural heritage

1. Introduction

The color of an object depends on the reflectance properties of the object that are dependent on its physical and chemical composition. But also, color depends on the light source and the human being that views the object [1]. In this case, the light source and the observer who sees the artwork can vary but the reflectance of the artwork is inherent to it. Digitalizing artworks or paintings for color-accurate measurements is widely studied in the literature; usually, CIE color spaces must be considered to match reflectance and perceived color [2].

Spectral reflectance defines how a material reflects light when it hits the surface. The reflectance is a function of the incidence angle and the material itself. It can be quantified with different methods. The Commission Internationale de l'Eclariage (CIE) has a recommendation that comments on the practical methods for the measurement of reflectance and transmittance [3]. The best method to measure reflectance is the use of an integrating sphere. Classical colorimeters use this optical technique and are widely used in the industry, for example, in the automotive sector. The use of an integrating sphere needs contact with the surface, so it is not recommended in cultural heritage because of possible damage to the artwork. In this case, following the CIE recommendations and the geometric conditions, it is possible to use a light source and a spectrophotometer, **Figure 1**. This setup is

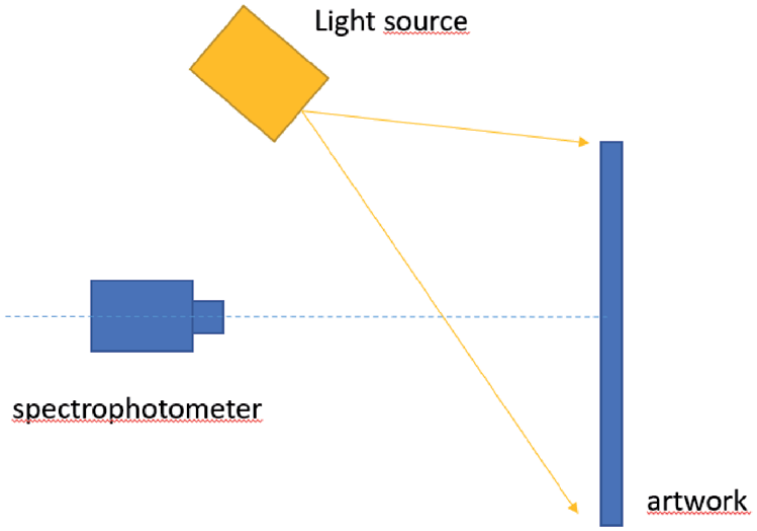

Figure 1.
Schematic setup for non-contact spectral reflectance measurements.

non-destructive for the artwork and requires a white diffuse reflectance standard, a stabilized light source, and a spectrophotometer, both of which should be positioned carefully at 45° or the desired angle to measure the reflectance.

The measurement process involves the use of a calibrated white diffuse standard that will be measured in the same position as the artwork. The spectral reflectance will follow the formula:

$$\rho(\lambda) = \frac{\phi(\lambda)_{out}}{\phi(\lambda)_{in}}, \tag{1}$$

where F_{out} is the reflected flux and F_{in} is the incident flux that must be obtained using the reference white that has a known spectral reflectance, so:

$$\phi(\lambda)_{in} = \frac{\phi(\lambda)_{out}}{\rho(\lambda)_{standardwhite}}. \tag{2}$$

Using this technique, the spectral reflectance of an artwork can be measured point by point, but a spectrophotometer measuring in this way has a circular relative measurement area of around 5 mm in diameter that depends on the used object lens and the focusing distance, as in the example of the spectral characterization in Picasso's painting *Guernica* [4]. Therefore, the utility of the measurement as a global characterization is low because part of the area of the painting is not covered by the measurements.

This measurement procedure can also be applied to sculptures, but there is a higher difficulty in establishing the correct illumination and detection angle than usually is recommended like angle 45° incidence and 0° detection. **Figure 2** shows a spectroradiometer being calibrated with a white standard. The system comprises a lighting ring and a portable spectroradiometer. The system is designed to light in a 3D annular way with 45° over the selected surface and receive light at a 0° angle for

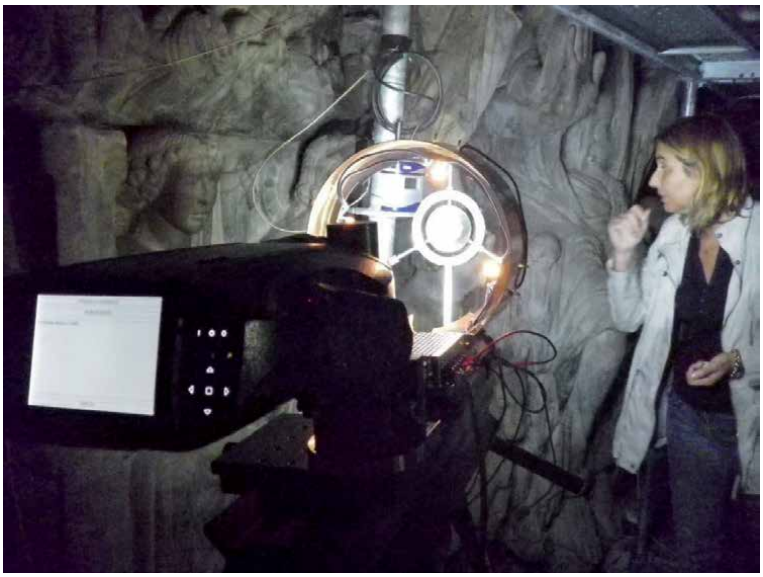

Figure 2.
Spectroradiometer with standard white at Pórtico de la Gloria.

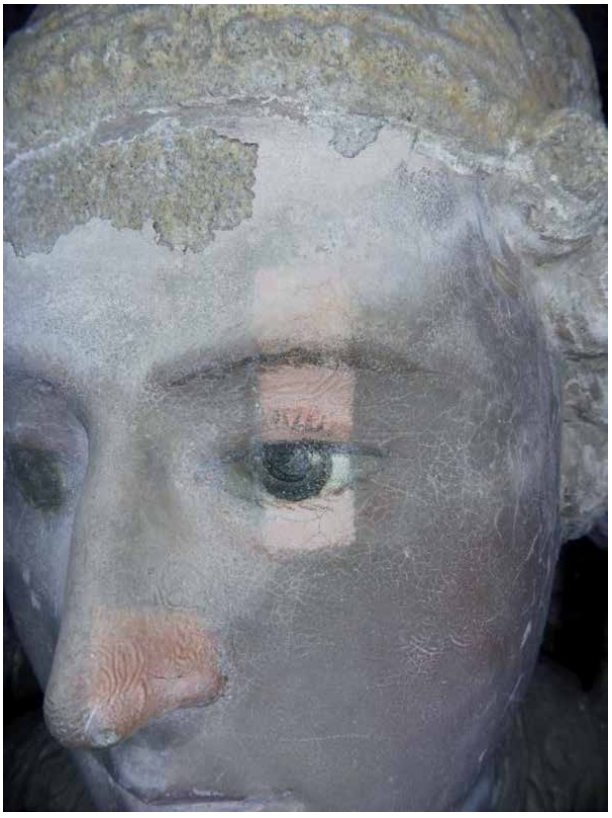

Figure 3.
Sculpture head with cleaned area in Pórtico de la Gloria. Santiago de Compostela.

spectroradiometric detection. The white diffuse reflectance standard had a reflectance of 0.75 over the visible spectrum, and if the same distance as in the sample is maintained, the absolute spectral reflectance is properly measured.

The system was used by the authors of this chapter to measure the Pórtico de la Gloria at Santiago de Compostela's Cathedral in Spain. One of the most complex problems in measuring spectral reflectance on sculptures is that the system must be not only aligned with every *x, y* point surface normal but also at the defined calibration distance. This setup was used to evaluate pigment cleaning over laser and chemical cleaning procedures. **Figure 3** shows the cleaning process that was done by Fundación Barrié, which was the leader and the funder of this project.

To solve the problem of measuring only a small area, it is possible to measure multi- or hyperspectral data with high spatial resolution and also integrate spectral data into a 3D coordinate system [5]. This method uses a multi- or hyperspectral camera usually called a 2D spectroradiometer that needs to be calibrated to obtain good acquisition data [6].

Multispectral or hyperspectral imaging is based on a calibrated CCD that has a set of bandpass filters to obtain the hyperspectral data cube. These bandpass filters are usually installed in a rotational optomechanical wheel.

In this chapter, we will discuss the use of 0–45° reflectance measurement system applied to two Picasso paintings, one for control of the painting condition and the other one to determine the effects on restoration of eliminating a varnish layer that was added after the painting and was drawn by the artist. In the next section, we will introduce a novel design that has a matrix of CCDs with a bandpass filter in front of each one. This will be used for spectral reflectance measurements on Dali's painting *Dos Figuras,* which gives a better resolution on the painting spectral data. Finally, conclusions will be presented.

2. Reflectance measurements on Picasso's paintings *Guernica* and *woman in blue*

As commented in the introduction, spectral measurements can report and are part of the preventive conservation of cultural heritage. If the artwork has been measured during time pass you got a time photograph of conservation and deterioration with regard to color. But non-invasive techniques are required in order not to damage the artwork. In the first part of this section, we will describe a spectral measuring system and a lighting source that are designed for reflectance measurements in a large artwork painting (dimensions 7.77 m × 3.49 m) [4] with non-contact and non-invasive techniques.

Guernica was painted by the famous Spanish artist Pablo Picasso in the year 1937. The artist painted it to attract the world's focus to the Guernica Basque country town located in northern Spain. This village was bombed by the German and Italian army on April 26, 1937. The painting was charged to Picasso by the Republican government for the 1937 Paris' World Exhibit forum. This painting is related with the sacrifice of war and is considered by experts as a peace and anti-war symbol.

We will show a detailed matrix data of Picasso's *Guernica* paint by measuring reflectance factors in selected points located in rows and columns over the painting. After the measurement process, a database containing spectral and colorimetric data has been obtained. This database is georeferenced on the painting and could be useful in the future to track the conservative status development of this painting. This database also could be useful to optimize lighting when exhibited.

2.1 Measurement system configuration

A non-contact spectrometer, a lighting source designed for this task, and several additional instruments conform to the measurement system. Spectral

Figure 4.
Annular ring source for 35° lighting with a hole in the central area for spectroradiometric measurement.

measurements were taken between 400 and 780 nm every 4 nm with a Photo Research PR-655 spectroradiometer equipped with MS-75 accessory optical lens [7].

Geometrical conditions are determinant on the measurement repeatability, and in this case, the instrument was placed 570 mm away from the painting surface. The relationship with instrument optical lenses makes that the measured area reach 23.7 mm^2. The lighting source was placed around the spectroradiometer in a ring-shaped form with an angular incidence of 35° with the normal vector of the measured area, **Figure 4**.

It must be noted that reflectance data are dependent on angular conditions; thus, obtained data for lighting at 35° could be different when lighting is at 45°. Therefore, system configuration should be maintained in the case of new measurements along time.

The source was made of four halogen light bulbs at 3500 K and eight white LEDs at 6500 K. The halogen light bulbs were selected to fill the spectra in the wavelengths that the LED has less flux to improve the spectral response of the system. The lighting system was powered by a current power supply to improve LED stability over time, and anyway during the measurement process lighting condition will be checked using the standard patron. **Figure 5** shows the spectral emission of the designed source used to light the measurement area.

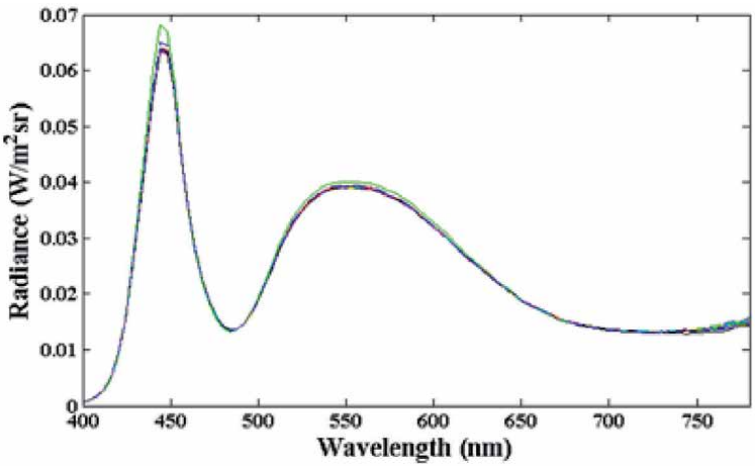

Figure 5.
Source spectral radiance (halogen+LED).

The use of a LabSphere white diffuse reflectance standard during the measurement permits us to obtain the reflectance factor at the desired x, y location. In this way, temporal changes on the source flux due to aging, current variation, or any other are considered in the reflectance calculation.

2.2 Cartesian displacement device

The painting dimensions required a large rail displacement system; in this case, XYZ Cartesian rails were developed with position accuracies of 25 microns on each axis. On board this rail, there were a platform that was moved by a computer system linked to the instruments. Onto this platform, the spectroradiometer with a CCD and a computer-controlled laser telemeter were installed. The laser telemeter was of higher importance because it permits to place the scientific instrument at a constant distance from the painting surface. As it was demonstrated after the painting surface has a topographical variation in the Z-axis making the surface non-flat, **Figure 6**. These deformations did not affect the measurement accuracy because the instrument was placed at a controlled distance all over the painting. The large dimension and weight of *Guernica* is part of this topographical issue that is not visually noted.

2.3 Color calibration

To ensure the correct calibration of the system, it is necessary to check performance all over the measurement process. One of the most used charts for color calibration is the GretagMacbeth ColorChecker (X-RITE). In this measurement process, the 24 chart samples were measured. Each sample spectral reflectance factor and the CIELAB Lab data were collected. For this calculation, CIE 1931 standard observer and D50 CIE illuminant were used. The instrument deviation in relationship to manufactured data was of $\Delta E = 1.16$ CIELAB color units.

2.4 Reflectance data

Reflectance data from 2201 points were measured with this technique. The time for measuring that number of points was around 10 h working at night for 3 days. The measurement process is slow due to the robot movement and the stabilization period where the system needs to stop before a measurement is made [8].

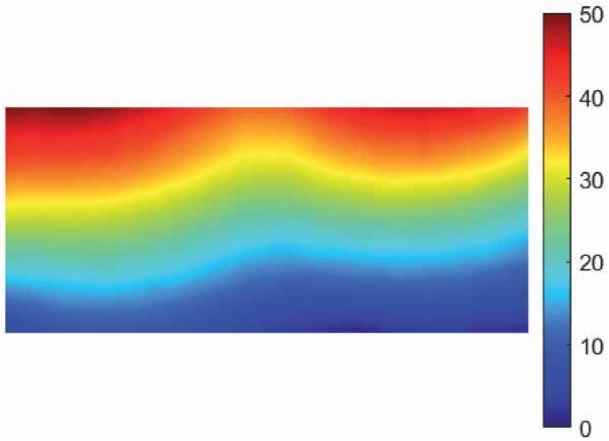

Figure 6.
Guernica topography matrix, data in mm.

These reflectance data along points were required by Museo Nacional Centro de Arte Reina Sofía in a specific format to have a valid reference for future inspection on the conservation state of the painting. As an example, **Figure 7** shows two of the selected points, one on white pigment and another one on black pigment. The circular black area in the zoomed images on the right (samples 7 and 1) is related to the measurement area as can be shown in **Figure 7**.

With the obtained data reflectance is calculated, **Figure 8** presents the spectral differences in two different samples. In this case, sample 1, which is mainly composed of a white pigment, has a higher reflectance than sample 7, which is measured over a black pigment.

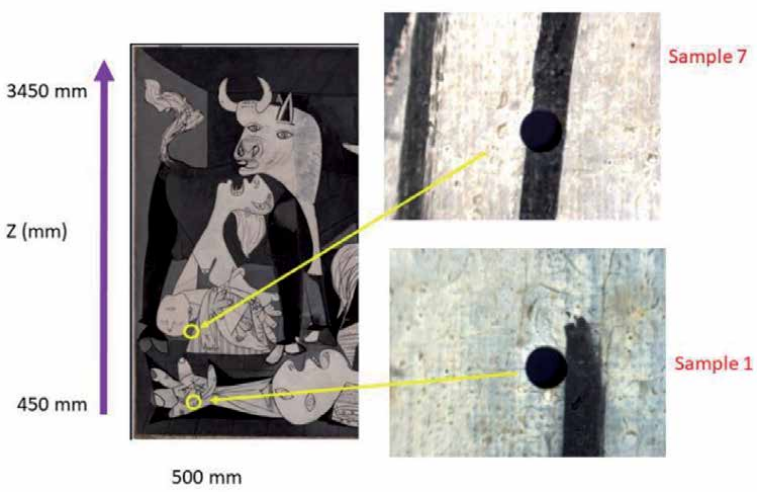

Figure 7.
Sample measurement area and detail for samples 1 and 7.

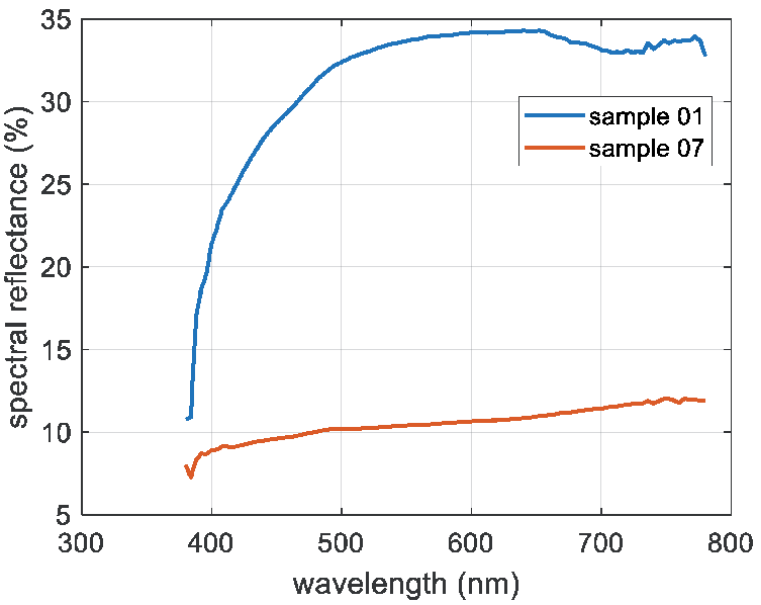

Figure 8.
Spectral reflectance for samples 1 and 7.

3. Reflectance measurement on Dali's painting *dos Figuras*

The project Photonic Restoration Applied to Cultural Heritage on Dali's painting *Dos figuras* (1926) is a competitive project subsidized by the Spanish Ministry of Science, Innovation and Universities. The project aim is to restore virtually with light projection the Dali painting "Dos figuras". This restoration will require and will be based on spectral measurement data.

This painting is in a bad state of conservation with some irreversible damage that prevents the painting from being appreciated in its original state, **Figure 9**. The Reina Sofía Museum has consolidated the canvas and stabilized the pigments to avoid further damage. But to maintain the painting, it was decided not to intervene anymore in a physical way after consolidation was done. Thus, this project opens the possibility to restore this painting virtually without physical intervention, just with light.

The project was divided into three phases: The first one is the study of the artwork and the process that has led to the actual conservation state (**Figure 10**); the second one is the characterization of the reflectance of the painting and the obtainment of 3D geometric data; the final phase consists in designing an algorithm to virtually restore the painting without physical intervention.

To characterize the painting, it is possible to use any of the reflectance methods commented in previous paragraphs. The example of the characterization of *Guernica* is a low-resolution method, therefore the UCM team (www.ucm.es/lightingandcolor) decided to improve the characterization resolution. In this way, a new design of a hyperspectral camera [9] with higher resolution and an interchangeable filter possibility was necessary.

3.1 Hyperspectral matrix camera

A hyperspectral camera is a system that can measure a hyperspectral cube of spectral data [10]. Typical scientific hyperspectral cameras have resolutions of around 1.4 MP. In the case of this painting, which is 2 m long, it implies approximately 1 × 1 mm square measurement resolution in the painting. This could be improved with higher sensor resolution. The designed CCD has 12 cameras, **Figure 11**, with a 12.3 MP

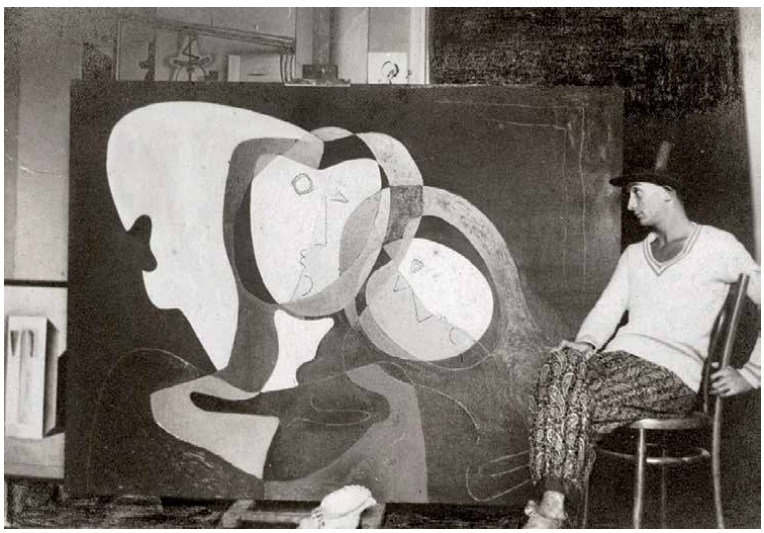

Figure 9.
Original state showing the painting and Dalí, year 1926.

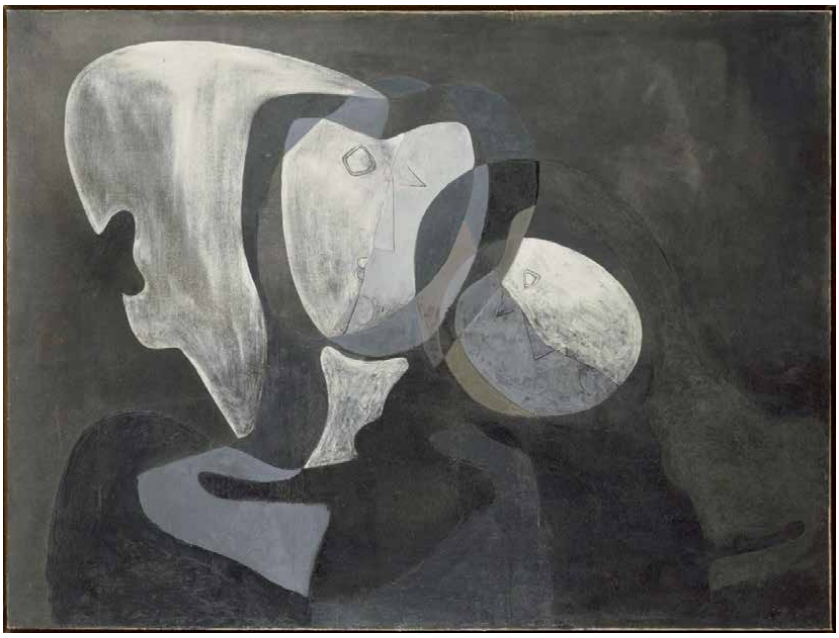

Figure 10.
Painting dos Figuras (1926), Salvador Dalí, year 2021.

Figure 11.
Optical filter detail for hyperspectral camera.

sensor that provides a 0.3 × 0.3 mm resolution on the painting for spectral reflectance data. The hyperspectral camera can be suited with 12 narrowband filters selected depending on the measurement needs.

This camera is currently being calibrated on the group laboratory, **Figure 12**, using a calibrated reflectance standard and a stabilized LED light source. Also, for spectral reflectance measurements, a white background was previously measured

and accordingly calibrated in spectral reflectance. This white background was made of a uniform rectangular piece of foamed PVC and once calibrated, it will be used to calculate spectral reflectance all over the picture area.

Hyperspectral system calibration is essential to obtain reliable measures and needs to be executed before any measure is made. In **Figure 13a**, comparison is made between a commercial system that measures each 4-nm band but only in a

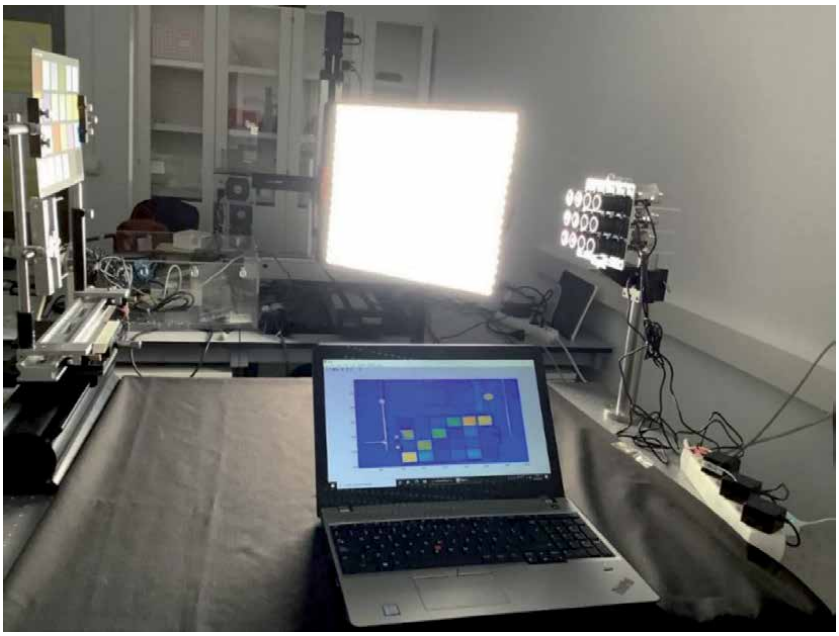

Figure 12.
Hyperspectral CCD calibration procedure.

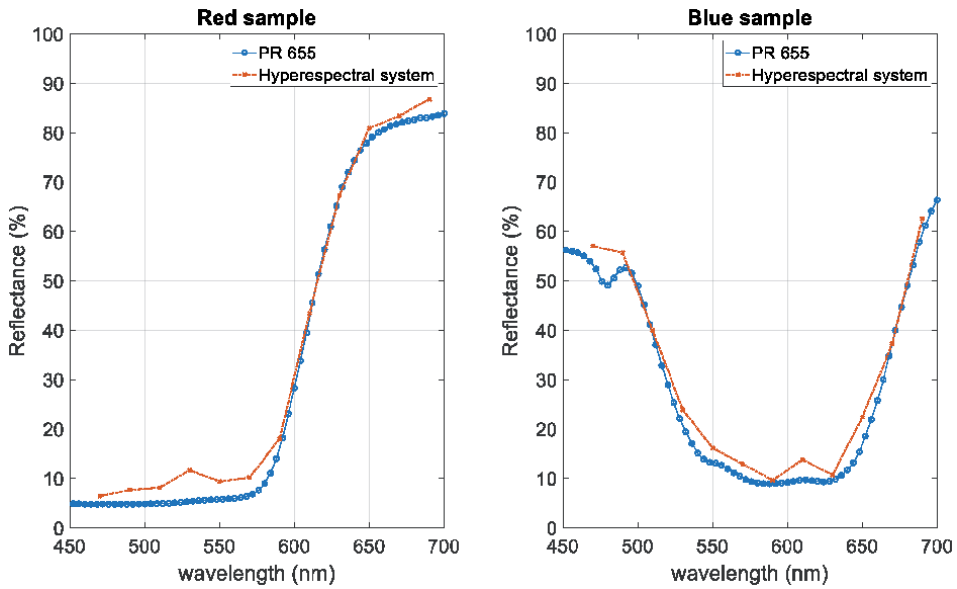

Figure 13.
Reflectance comparison between commercial PR655 spectroradiometer and custom made 12 filters hyperspectral system.

5-mm area and the hyperspectral system that measures each 30-nm band but the measurement area is 0.3 mm.

4. Conclusions

Cultural heritage conservation is having a new paradigm with new optical techniques. Moreover, the conservation procedure can be improved with the help of reflectance spectral measurements. In the case of deteriorated artworks, the spectral characterization is useful for having an objective "photography" of the current state of the pigments. Instrument resolution is also of high importance because of the higher resolution, more accurately data are collected on the artwork for future review. These data could lead us to virtually restore an artwork with previous data and with the curator and restorer help. As a conclusion, the reflectance measurement system must be chosen according to experimental necessities, and some experiments will require wavelength precision and others will require a small area detection. Color changes due to artwork deterioration or changes in lighting conditions are easily calculated with spectral reflectance data.

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Appendices and nomenclature

CIE	Commission Internationale de l'Eclariage

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Chapter 13

(In)tangible Heritages: A Critical Review for an Alternative Heritage Discourse (ALHD) Perspective in Sub-Saharan Africa

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Abstract

Heritage conversation has continuously elicited genuine concern from stakeholders, evokes controversies, and creates disputes in determining its worldview that is truly considered universal. The concern on the adopted Eurocentric perspective of Authorised Heritage Discourse(AHD) and the emerging calls for an Alternative Heritage Discourse (ALHD) constructivist and transformative post-modernist worldview. The sustainability concerns for all indigenous and national cultures that are in accordance with their unique value system are here considered paramount. The study essentially, undertook a critical review of the historical evolution of the heritage discourse, through the three major charters and conventions of 1964, 1972, and 2003 towards contextualising the discourse perspective. The study was undertaken through a critical review of relevant literature chronologically on the heritage subject matter. The study product is the development of a framework for ALHD that is conscious of the indigenous communities' value systems within Sub-Saharan Africa. The study recommended the use of an integrated heritage discourse framework for the identification, documentation, and conservation of indigenous heritage features and landscapes jointly by all stakeholders towards ensuring that sustainable transgenerational heritage is bequeathed.

Keywords: Alternative Heritage Discourse (ALHD), Cultural Landscapes, Indigenous Architectural Heritage, (In)tangible Heritage, Stakeholders Value Preferences, Sub-Saharan Africa

1. Introduction

Although the Authorised Heritage Discourse (AHD) perspective have dominated the heritage worldview for most of the twentieth century. However, the Post millennium, Sustainable Development Goals(SDGs) era has brought to question more pointily prevalent heritage tenets. The concern of relegating Intangible Cultural Heritage (ICH) against Tangible Heritage (TH), the stance

on indigenous architectural heritage and the critical place of socio-cultural value preferences of stakeholders and the diversity of perspectives in determining heritage value and its significance are prevalent. Furthermore, the latest discourse perspective has once more provided critical stakeholders' opportunities to contribute to the debate and propound convincing arguments for possible adaptation and mainstream integration. The chapter, therefore, calls for new questions, new responses that are holistic, integrative and sustainable for all peoples and cultures of the world in the post-modernist millennium for SDGs attainment in current and future heritage management base on a paradigm shift.

The paradigm of intangible tangibility and the tangibility of intangibles are quite contradictory and seeming divisive, however, the chapter argues that all the tangibles heritages are living and have their existence at the instance of the intangible's cultural heritage dynamisms. Therefore, all tangibles (physical) domains are first and foremost intangible (spiritual) beings; without which nothing seems to exist at the perceptual domain and the said realm of reality. The tangibility of intangible heritage features also confirms Vecco [1] argument that heritage discourse has merged into one, the past testimonies and its goods; which is being driven by the intangible resource base [2]. If Alternative Heritage Discourse (ALHD) would remain relevant and all-encompassing, then it should therefore be true in spirit and the letter of its profession. It must be professionally guided, but socio-culturally anchored on indigenous immaterial and material societies developmental processes. The study propounded integrative heritage view is akin to the architectural 'form follows function' paradigm of Luis Sullivan in the nineteenth and early twentieth centuries. It means space is created base on its functional requirement or necessity space or material heritage is an extension of the immaterial socio-cultural processes of any people. Frank Lloyd Wright argues however that form and function are the same further also reinforces the intangible tangible and tangible intangibility as the same. Essentially affirming that each one of the two heritage categories and domains flows into one another thereby giving birth to some of the great architectural masterpieces in the modern era of architecture. However, translating the established argument of the nineteenth century had been quite impossible due to the highly machinated arguments of the architectural modernist movement lead by Walter Gropius, Le Corbusier and Ludwig Mies Van der Rohe amongst others [3–5]. Thus the question of an integrative nature of things and thought is now even more pertinent in the post-millennium evolving heritage perspective arguments.

A chronological evolution of heritage discourse perspectives over time and their critical milestone principles and positions as well as how they foreshadow current accepted reality will be carefully analysed. Therefrom congruence viewpoints and their point of divergence will serve as a guide in critically creating a true picture for Alternative Heritage Discourse (ALHD) for all times as the chapter's contribution. Heritage here is considered as a living socio-cultural process over time, it could be from the past, an expression of the present and could be a projected futuristic realm. Simply, heritage is considered a process that transcends time in nature (form) and operation. Heritage is beyond the past, rather encompasses the present that could be operative in the future-for all generation. At this point, the study addresses heritage definition, concepts and various discourse perspectives, while contextualising them for the study purpose. To understand the architectural heritage worldview, the study firstly highlights the broad concept of heritage definition and evolutional process from inception to contemporary worldview. An analysis of the concept of cultural heritage and its evolution in Western Europe stated that the coinage of the

term heritage was from French Patrimoine-parent heritage that is for personal heritage which went through an epoch of evolvement to its present usage [1]. Similarly, the word monuments were originally considered as an expression of worthy historical testimonies being preserved [6]. With the French revolution, the royal properties were appropriated as that of the public based on the secularisation principle. Indigenous Architecture here has to do with the architecture that is native to a people and evolves from the socio-cultural processes and sustenance needs including the desire for the activity's habitation. Indigenous is both in terms of design concept, materials and construction techniques and distinguishes it from vernacular and traditional architecture. It is the indigeneity sustenance of heritage that requires reassessment within the global context of heritage discourse.

Study's chapter review is justified considering the prevalence of the AHD perspective which is mainly Eurocentric information and operation. Further, the exclusion of very potent indigenous heritage features across Sub-Saharan Africa on the guise of their not being of universal significance required a critical revisit. If the future and identity of the Africans and their heritage resource base would be sustained over the next century, the concept of ALHD must be appropriately integrated into the subsequent process of heritage discourse, conventions and charters. The evolutionary trend of heritage at various point in history demonstrated that just before the Second World War, the heritage concept became internationally institutionalised and did imbibe the cultural dimension with the 1931 Athens conference. The conversation translates from the objective to the subjective, which is from historic monument to logic of the heritage, and that is where the tangible and intangible heritage debates emanated. Heritage-monument discourse was however gradually merged into one by adoption without a clear statement on why and in what way the parental inherited goods and the testimonies of the past became one, but for the event(s) of history [1]. The events of history that have defined our heritage discourse for almost a century seems to have arrived at a threshold and requires a thorough reassessment to propound sound holistic heritage discourse paradigm shift. It is the examination and contextualization of the heritage discourse perspective that could halt the prevalent trend of material heritage against the immaterial heritage perspectives. This review chapter believed that the immaterial (spiritual) and the material (physical) are the same, first as a process and then secondly as a product.

The study scope is within three charter of 1964, 1972 and 2003 in the perspective of indigenous architecture of Sub-Saharan African communities. It is worthy to state that critical charters and conventions undertaken by relevant heritage organisation within the stated period do not necessarily exhaust all pieces of literature on the subject matter. Several efforts have been made on the concern of Africans on heritage discourse perspective in the global sphere. These concerns have indeed resulted in several efforts as the considerations had earlier been underscored based on 1989 (Recommendation on the Safeguarding of Traditional Culture and Folklore). Similarly, the 2001 and 2002 United Nation Education, Scientific and Cultural Organisation (UNESCO) Universal Declaration on Cultural Diversity and the Istanbul Declaration respectively. In the chapter contribution context, therefore, intangible heritage serves as the heart of heritage discourse and perspectives development. Subsequently, the intangible evolves into a product in form of tangible heritage within historical or cultural settings. The duo of intangible and tangible heritages is driven by the stakeholders' significance value preferences, thereby giving birth to a global view that is considered holistic and integrative of all processes and products from generation to generation.

2. Evolution of heritage discourse perspectives

Because of the transcending nature of the heritage process, the indigenous African heritage had suffered untold interruption since the colonialization adventure. In most instances, the religious and spiritual attachment of the people to their land, cultural festivities, ritual process and ancestral responsibilities are severed. The severance of the people from their socio-cultural living process has made it quite difficult for their heritage to be sustainable regardless of their designation as tangible or intangible. The Abrahamic faiths have virtually erased the African beliefs systems and thus their life processes which determine their heritage. The process of breaking the indigenous African from their cultural festivities and ceremonies through rituals started with destroying and looting their artefacts, exporting archaeological findings and indoctrinating them with a new belief system that is not compactable with their worldview. Such viewpoint still dominates the African continent and determines their perspective; however, the tide is rising in contradiction of the prevalent directing of thought. The coming tide cannot be swept away under any guise, considering the barefaced reality of past detours and the urgent cry for the truly known reality of the Africans-their customs and traditional lifestyle. On the other hand, the universal heritage concept evolved from the charters, conventions and resolution of UNESCO; which does not necessarily demonstrate the unity of the spirit and the letter as initially advocated.

A broader view of heritage concept showed that over the years' scholars have demonstrated that the heritage concept and discourse can be visualised in two dimensions (visible and the invisible; material and immaterial or tangible and intangible) components and that each is complementary to the other rather than isolated. It is, however, worthy to note that definition and identity clashes of heritage discourse across the varied socio-cultural divide have many strains [1, 7]. The varied strains are often visible across all regions of the world [8, 9]. Accumulated research demonstrated that the visible(tangible) cultural heritage as in **Table 1** is often presented as the generally accepted perspective of most discourse [13]. From such viewpoint tangible heritage is repeatedly considered as the main type of heritage that tourist admires, locals hold unto and managers pride themselves about, which is referred to as the Authorised Heritage Discourse (AHD) perspective. Though, AHD perception seems to be mostly Eurocentric and mainly conversed in the past; recently, the invisible(intangible) heritage as in **Table 2** are no longer glossed over. In fact, since the 2003 convention intangible(immaterial) heritage now serves as the real driving force of the material heritage [2]. It is this new perspective of the tangible and intangible heritage that provokes this study and specifically its relevance in strategic placement of architectural heritage features as they are valued amongst indigenous African communities of Sub-Saharan Africa [10, 16]. This tangible and intangible definition and discourse conflicts is illustrated in **Tables 1** and **2** and will here further analyse and synthesised for ease of understanding and subsequent applicability in the empirical conceptual studies. The specific attributes of tangible and intangible heritage attributes of tangible and intangible heritage further aggregated in the next section based on the relevant charters.

The review discourse is both thematic and typological in categorisation, where intangible and tangible heritage perspectives are considered as a process that could evolve into a product. Discourse perspectives of the tangible heritage categorisation and its subcategorization, stating implication concerning the study perspective is as indicated in **Table 1**.

S/nos	Heritage categorisation	Sub-categorisation	Remarks
1	Cultural	Monuments: Architectural, sculpture & paintings, archaeological structures, inscriptions, cave dwellings and combinations of features.	Traditionally these were the first set of buildings that invoke the concept of architectural heritage and the need for their conservation.
		Group of Buildings: Separate or connected buildings with homogenous of place on landscape.	Group of buildings form an integral part of cultural landscape heritage features and quite relevant for this particular study.
		Sites (works of man or combined with nature, areas including archaeological sites which are of Outstanding Universal Value(OUV) from historical, aesthetics, ethnological and anthropological point of view).	This landscape features are similarly significant for the study of indigenous settlements across the study area.
2	Natural	Physical and biological formations or groups.	Most indigenous communities are an integral part of the natural and geological landscape.
		Geological and Physiographical Formations and Delineated Areas of Threatened Species.	
		Natural sites or Precisely Delineated Natural Areas.	
3	Mixed Cultural Landscape	Clearly defined landscape: Gardens and parkland landscapes constructed for aesthetic reasons of not always associated with religious or monumental buildings.	The mixed cultural landscape is an integration of the man-made and naturally endowed features of a site. This is where the study cultural landscape sites could be also categorised.
		Organically Evolved Landscape: Relics or fossil landscape, continuity landscape.	
		Associated Cultural landscape: Virtue of powerful religious, artistic or cultural association with natural element rather than material cultural evidence.	

Source: Adapted from [10–12].

Table 1.
Outline of heritage discourse and categorisation (tangible heritage variables).

The illustration shown on **Table 2** indicates the main domains of intangible heritage features including their sub-categorisation and the remarks demonstrates how each intangible heritage has a tangible equivalent space.

Heritage concept as tangible and intangible having Alternative Heritage Discourse (ALHD) as prevailing perspective is critically analysed here. In their study, Smith and Campbell [17] argued that the term intangible heritage is a misrepresentation and contradiction of the concept of heritage based on the Authorised Heritage Discourse perspective. Their perspective of considering intangible heritage as being merely a tautology is nevertheless, both contentious and agreeable. It is first considered as agreeable because it has been argued that all heritage is intangible [2]. However, the averred perception of all heritage as intangible also believes that heritage is a process but unfortunately a process that is mainly a preoccupation of the experts or professionals. The contention here is that intangible heritage is here considered more community centred in outlook and process and enabled by professional guidance and not serving as its determinant. Intangible cultural heritage bearers are considered as a critical part of the process of heritage discourse and categorisation as well as the listing requirements. The critical role of the local community and their socio-cultural significance in intangible

S/nos	Heritage categorisation	Sub-categorisation	Remarks
1	Main domains of Intangible Cultural Heritage(ICH)	Oral tradition and Expressions	This is where most of the Sub-Saharan African civilization is currently quite visible and continually in practice as a living culture. Though there has been some transformation over the years, these heritage domain features are the essence of the visible heritage buildings and monument across most of the indigenous African communities. Intangible architectural heritage fora or physical environment in order of the presented domain could be stated as; (a)Courtyards, Fireplace & Village square; (b)Village Square; (c) Village Square, Shrine, Sacred Grove/ Forest; (d)Courtyard, Farmland, Craft centre and (e) Blacksmith hut, Crafts shed & Terra cotta centre.
2		Performance Arts	
3		Social Practices, Rituals and Festive events	
4		Knowledge and Practice Concerning Nature and the Universe	
5		Traditional Craftsmanship	

Source: Adapted from [10, 14, 15].

Table 2.
Outline of heritage discourse and categorisation (intangible heritage variables).

heritage discourse distinguishes it from the tangible heritage; which can be argued as mainly a product of the Eurocentric world view anchored by the experts [2, 13, 18]. The consideration of intangible heritage as contentious in heritage discourse is anchored on the fact that it is the pressure from mainly excluded heritage realities of the southern hemisphere (Asia and Africa) that gave birth to the recognition of alternative heritage discourse. The intangible heritage discourse perspective has greatly questioned the 1964 Venice Charter for conservation and restoration of monuments and sites, which concretised the Authorised Heritage Discourse perspective for most of the twentieth century. In 2003 based on several contentious discourses and misrepresentation that cause misunderstanding, the convention for the Safeguarding of the intangible cultural heritage was born [14]. Towards furthering the diversity of views by various researchers Smith [2] argued that an increasing number of heritage studies is currently ongoing on multi-disciplinary research and practices. Smith also claimed that heritage is a process of acculturalization; which often involves diverse aspects of its study.

3. Tangible cultural heritage categorisation (1964 to 1972)

The International Council for Monuments and Sites (ICOMOS) Venice charter of 1964 was a product of the 2nd International Congress of Architects and Technician of Historic Monuments (ICATHM) held on 25th to 31st May 1964, further derived from the Athens Conference of 1931 and Italian Restoration Convention of 1932. During the congress, it was agreed that monuments and sites protection should be towards achieving social usefulness within the heritage historical setting and maintaining its original scale. However, since the Venice conference declaration, not much has been heard of the instrumentality of social value as the commanding light for global architectural heritage conservation. It became particularly Eurocentric and materially oriented with the promulgation of the 1964 Venice charter. The International Charter of Venice of 1964 first article did considered heritage as;

> *"The concept of a historic monument embraces not only the single architectural work but also the urban or rural setting in which is found the evidence of a*

> *particular civilization, a significant development or a historic event. This applies not only to great works of art but also to more modest works of the past which have acquired cultural significance over time" [11].*

Unfortunately, cultural significance with time in most indigenous Africa cultural setting might mean nothing but an expression. After all, the concept of OUV that is supposed to guarantee authenticity, material integrity, universal significance and management practices is nebulous and ineffective in the application within indigenous cultural landscapes.

3.1 The Venice charter of 1964 (international charter for the conservation and restoration of monuments and sites)

Athens Charter of 1931 laid the earliest principles that later give birth to the 1964 Venice charter that has sixteen articles commencing with the assertion that it was;

"Imbued with a message from the past, the historic monuments of generations of people remain to the present day as living witnesses of their age-old traditions. People are becoming more and more conscious of the unity of human values and regard ancient monuments as a common heritage. The common responsibility to safeguard them for future generations is recognized. It is our duty to hand them on in the full richness of their authenticity" ([11], p. 1).

Considering that a message from the past in form of historic monuments abound in virtually all cultures and communities through time; there is therefore the concern of which message is more dominant and how does preserving it preserves other people's historical past. What is being argued here is that each people have a message for their future generation and based on their cultural values. It, therefore, becomes quite difficult to segregate some features as the sole witness of the traditional past and as a unique representative of human civilization. Similarly, though there is an observed unity of human value, they cannot be said to be the same or the listed heritage as the only representation of the common heritage for all cultures. For a fully rich authenticity assessment of heritage features, all parameter of the various heritage culture and tradition should form the core framework (tangible and intangible).

The second paragraph of the charter argued that "... with each country being responsible for applying the plan within the framework of its own culture and traditions."([11], p. 1). The concern however is that how could each country apply the plan base on the framework of its culture and tradition when in the first instance their unique culture and tradition were not fundamentally the basis of the charter. This concern ultimately was realised when the intangible heritage argument was adopted. Unfortunately, the ICH was also treated as just an alternative heritage rather than considering them as an integral part of the process of heritage development.

3.2 1972 convention for protection of cultural and natural heritage

As preliminary procedures for the convention held in Paris from 17th October to 21st November 1972 the 17 sessions of the UNESCO congress noted that; heritage features are continually being threatened and often destroyed as a result of traditional causes and socio-economic dynamics, thereby aggravating the concerns of these occurrences [12, 19]. Further consideration was made concerning the deterioration and its effect on the cultural and natural global heritage. Similarly, the consideration and concern for lack of adequate resources and technical know-how amongst nation towards protecting these heritages led to the adoption and promulgation of the convention. The charter is made up of eight sections and 38 articles According to article 1 of the charter it categorised Cultural heritage as being;

S/nos	Heritage charter/convention/ recommendations	Year	Unique features	Remarks
1	Athens Charter	1931	Some international doctrines based on adopted principles were used in drafting an international practice code. This code is for the protection of monuments and sites; which can be achieved through conservation, restoration and contextual consolidation of the monument site.	Laid the foundation for the Authorised Heritage Discourse that was centred on tangible cultural heritage.
2	Italian Restoration	1932	An official "Scientific Restoration" standard was supported as a form of methodology for protective intervention on ancient monuments and sites.	As home to some of the best known classical architectural master pieces, the restoration template ultimately laid the basis for subsequent conservation activities in other heritage structures that were considered as worthy of being universally recognised.
3	Venice Charter	1964	The charter codified standards for conservation and restoration practices as it regards historic monuments and sites.	Is the framework for tangible cultural heritage identification, conservation and listing
4	Amsterdam Declaration	1975	It provided support for the integrated conservation undertakings with respect to single monuments, urban and regional planning and its processes. Here the integrated conservation was adopted that incorporated historical knowledge, conservation, socio-cultural benefits and behaviour.	The first major concern on an integrated format for heritage conservation, which ultimately has effect on the 2003 convention on safeguarding intangible heritage as being a critical aspect of true conservation intent.
5	Nara Document on Authenticity	1994	Societies are a manifestation of their heritage that is engrained in art, music and literature as their civilization often in form of tangible or intangibles value expressions that deserved noteworthy esteeming.	The significant place of society in the management of heritages was brought to bear, thereby reiterating the place for an integrated concept of conservation, that can be enduring.
6	The Burra Charter	1999	Defined subjects in relation to cultural heritage significance providing guidelines for management as well as conserving diverse sites of cultural significance. The cultural value of significant places is natural, indigenous and historic.	This Burra charter brought out the significance significant value of indigenous heritage places, particularly in Sub-Saharan Africa where the place

S/nos	Heritage charter/convention/ recommendations	Year	Unique features	Remarks
7	Charter of Cracow	2000	Specific conservation interventions on architecture, urban and landscape heritage as well as artefacts are categorised as environmental control, maintenance, repair, restoration, renovation and rehabilitation.	This allow for the indigenous landscape heritage to be conserved based on various perspectives; ie; using environmental control, repairs and restoration.
8	ICOMOS-ISCARSAH Charter	2003	Cultural heritage conservation and restoration are treated as engineering and technical activity. Thus the place of scientifically based understudy of actual realities and effects on the monument or site as the principal basis for any action.	Due to the highly technical and scientific requirement for engineering conservation activities current conservation effort are better managed based on accurate data collected.

Source: Adapted from Rouhi [20].

Table 3.
Other selected charters, conventions and recommendations on heritage conservation and restoration.

> *"(i) monuments: architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of outstanding universal value from the point of view of history, art or science; (ii) groups of buildings: groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of outstanding universal value from the point of view of history, art or science; (iii) sites: works of man or the combined works of nature and man, and areas including archaeological sites which are of outstanding universal value from the historical, aesthetic, ethnological or anthropological point of view" ([12], p. 2; [19], p. 10).*

While article 2 of the charter considered natural heritage as;

> *"(i) natural features consisting of physical and biological formations or groups of such formations, which are of outstanding universal value from the aesthetic or scientific point of view; (ii) geological and physiographical formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants of outstanding universal value from the point of view of science or conservation; (iii) natural sites or precisely delineated natural areas of outstanding universal value from the point of view of science, conservation or natural beauty." ([12], p. 2; [19], p. 10).*

These natural heritage features in most instances are an integral part of the cultural landscape of indigenous communities' heritage. Therefore, even when such heritage categorisation is established, they do not necessarily affirm a definite demarcation. This is where the indigenous heritage features of most Sub-Saharan African categorisation become burdensome. In Africa, there is little distinction between the natural and cultural heritage and the tangible is seen as an evolvement of the intangible.

Furthermore, there are several other charters, conventions and recommendation during heritage discourse that need to be highlighted because of their relevance to the study as illustrated in **Table 3**. The table gives an idea of the evolution of the various heritage discourse perspectives towards giving birth to the main charters of the study.

4. Convention for the safeguarding of the intangible cultural heritage (2003 convention)

It could be argued that some of the perspectives on the place of indigenous heritage vice-a-vice the Eurocentric world view force the emergence of the 2003 convention on intangible cultural heritage. However, it could be further posited that the current position can only serve as the impetus to further the cause of integrating indigenous heritage perspective and create alternative heritage discourse which is what the chapter contribution is currently advocating. Base on the 2003 convention held on 29th September to 17 October 2003 at the 32nd session of the UNESCO general assembly in Paris France several referrals and consideration formed the basis of the final convention draft position [14]. Referrals were derived from 1948 (Universal Declaration on Human Rights), the 1966 International Convention on Economic, Social and Cultural Rights as well as the International Convention on Civil and Political Rights). The considerations were based on the supposition that intangible heritage is considered as the mainspring of diversity in culture and a central supporter of sustainable development. These considerations had earlier been underscored based on 1989 (Recommendation on the Safeguarding of Traditional Culture and Folklore). Similarly, are the 2001 and 2002 UNESCO Universal Declaration on Cultural Diversity and the Istanbul Declaration respectively. According to article one of the conventions, its objectives include;

> *"(i) to safeguard the intangible cultural heritage; (ii) to ensure respect for the intangible cultural heritage of the communities, groups and individuals concerned; (iii) to raise awareness at the local, national and international levels of the importance of the intangible cultural heritage, and of ensuring mutual appreciation thereof; (iv) to provide for international cooperation and assistance" ([14], p. 2).*

The stated objectives indicate that safeguarding the intangible cultural heritage, their respect, need for awareness which guarantees global assistance for the heritage indicates that the primary desire of the convention is to assuage growing calls for indigenous cultural resource acknowledgement, documentation and indeed their appropriate conservation and listing.

According to the convention's Article 2, intangible cultural heritage is;

> *"...practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity" ([14], p. 2).*

In providing a sense of identity and continuity of their heritage character, what the definition of intangible heritage is arguing, is its physical essence to a people's existence and subsequently bequeathed. On that basis, therefore, this thesis is equally arguing that intangible cultural heritage is in a way an integral part of the physical or visible heritage(s). There is to say, there cannot be a material heritage without its immaterial flip side. Though an immaterial heritage might not have a truly tangible component. Thus, the process-product argument of heritage is here affirmed as an integrated unit.

Further, the convention categorised Intangible Cultural Heritage (ICH) into five domains that include;

> *"(i) oral traditions and expressions, including language as a vehicle of the intangible cultural heritage; (ii) performing arts; (iii) social practices, rituals and festive events; (iv) knowledge and practices concerning nature and the universe; (v) traditional craftsmanship" ([14], p. 2)*

Intangible Cultural Heritages (ICH) are categorised as stated above, but what comes to mind then is whether all these ICH features are spiritual, invisible and therefore immeasurable in the same sense as the tangible? While the two heritage categories measuring scale might be contested as different; this chapter review maintains that they are an integral part of the processes of evolving heritage features, whether tangible or intangible. In other words, intangible heritage does birth tangible heritages as either movable, immovable, physical and therefore tangible. They are twins and need to be valued as an integrated whole, which could be a sure medium of protecting and safeguarding both heritages through integrated conservation strategies. This argument is best demonstrated in the cultural landscapes of indigenous communities of Sub-Saharan Africa and remain the principal basis of their conservation if they are to be protected and safeguarded for current and future generation.

The various charters have been evolving since the 1964 Venice charter, it considers the historic monuments to the contemporary tradition; where the

human value is consciously acknowledged as collective heritage that requires a concerted effort in safeguarding them for the future. The safeguarding and conservation strategy can only be achievable if the value essence of heritage is assessed properly. Subsequently, the 1972 charter for the protection of cultural and natural heritage came up; where the concern was on heritage features continual threats and destruction that was due to traditional dynamics and socio-economic causes. The charter of 2003 on safeguarding intangible cultural heritage five domains is an attempt to sort the growing southern hemispheric concern on the virtual exclusion of their heritage reality based on AHD. What the three charters and conventions have shown, however, is the changing dynamics of the heritage discourse and this chapter intends to extend it further to an integrated format, where intangible and tangible heritage features are identified, documented and conserved for listing as a holistic process-product endeavour. The charters and conventions discussed, have essentially aid in establishing the study focus from its historical past to contemporary socio-cultural realities amongst indigenous communities. It argued on the integrative nature of all heritage and the need to formally acknowledge such categorisation as well as their conservation for transgenerational benefits. The call for constant reassessment and review of global perspectives on heritage discourse for future revaluation and redefinition of heritage in accordance to ALHD perspective.

5. Tangible heritage listing criteria (monuments, ensembles and sites)

To understand the basis of heritage being considered and listed, the study further expounds on the various criteria necessary to list a building, monument or site in this section. Similarly, a clear understanding of the architectural heritage features as being different from the monument, ensembles and sites is undertaken. Here heritage features are considered as physical or immaterial attributes identifiable with a society, monument is however mostly multidimensional structure with art historical, political, technical or architectural relevance to a people [11, 12]. The key ingredient for heritage listing based on the concept of Outstanding Universal Value (OUV) is anchored on authenticity, integrity and universal value significance [19]. By authenticity, it is meant as the quality of being genuine to be acceptable or even believed. There must be no pretensions, but serving as original based on some honest essential features [21].

Based on the concept of authenticity, the credibility of truthful information is significant in value attributes. It is worthy to state here that the value attribute does vary from one culture to another and even within a culture. Therefore, the use of OUV in determining monumental heritage could be questioned even more emphatically. In examining heritage value within the cultural context the attributes for consideration are; "materials and substance; use and function; traditions, techniques and management systems; location and setting; language, and other forms of intangible heritage; spirit and feeling; and other internal and external factors" ([19], pp. 53–54). Correspondingly in establishing heritage integrity, the main concern is concerning the material integrity of the heritage feature specifically. To assess the extent of heritage integrity the OUV elements, their size and any effect of advertising development or neglect are established for a heritage. It is usually framed up as a statement of integrity that shows physical fabric condition, that could be the impact of controlled deterioration and the dynamism of the heritage function within the cultural landscape. Ultimately, the very critical factor for listing heritage is its value significance whether it is based on historical, art, science, aesthetic, ethnological or anthropological viewpoint ([19], p. 10).

The actual component units of heritage as monuments, ensembles and sites had been established in the definitions of cultural heritage as discussed in the 1972 charter and detailed earlier [19]. Heritage management strategy is, therefore, a critical part of the criteria required for its listing. There is also the concern for heritage future maintenance of its outstanding value after it has been inscribed. The need for long term legislation, the role of regulatory agencies, institutional and traditional protection as well as heritage effective boundaries is paramount. There is the need for the allowance of a buffer zone to shield the actual property being protected is quite significant. For an effective management system of protected properties, the stakeholders should have a common understanding, maintain planning, implementation, monitoring, evaluation and feedback succession. Equally, the stakeholders should always be involved in any strategy or action, allotment of basic assets, capacity building and functionally accountability.

As argued by ICOMOS [22] heritage listing were initially evolved around three (3) major frameworks of Typological, Chronological-Regional and Thematic frameworks. The World Heritage Committee(WHC) being strengthened by Global Strategy later esteemed the thematic style to heritage listing, this has since remained the accepted framework in use. The typological framework considered the various types of cultural heritage, while the chronological-regional framework has the world heritage viewed in term of time and space. It is worthy to state here that the thematic framework in listing heritage based on Outstanding Universal value (OUV) criteria did also utilised the typology of creative responses and continuity as indicated in **Table 4**. It is significant to state here that it was from the thematic framework as shown in the table that current heritage perception evolved to ultimately incorporate the concept of tangible and intangible heritage perspective being currently conversed, as the emphasis of the chapter's contribution. It, therefore, calls for a reassessment of the heritage discourse perspective that is holistic in terms of thematic, chronological-regional and typological nature. ICCROM 1976 report written by its director, similarly argued that the different heritage values that should be considered are the artistic, historic and typological values [22]. The artistic value here was concern with original and unique creation with exceptional universally acknowledged quality according to the experts. The historic value is a concern with the verification of the feature in terms of uniqueness/rarity, novelty, inspiration exercise in time and space by the heritage as well as status for the comprehension of development comparative to historic events. The typological value*:*

> *"... would seem to require explicit identification and distinction compared to the historic value, under which it would normally be considered, to guarantee that the characteristic works of a certain tradition menaced by disappearance due to development of modern life, could be saved and conserved in the form of typical examples, representative of a culture that risks disappearance, as well as in cases where these types of works do not represent the unique character that qualify works recognized universally from the artistic or historic point of view" ([22], p. 11).*

Heritage typological classification, therefore, encourages a variety of heritage features across the different cultural settings which essentially could ensure that threatened heritages or those at risk of disappearing are appropriately identified, documented and conserved for transgenerational benefits. In short there should be develop an integrated framework for heritage identity and listing process that is all encompassing and holistic inconsideration of all cultures and peoples.

In the course of listing various heritage features, UNESCO with the technical support of the World Heritage Committee utilised some criteria to arrive at the

S/nos	Criteria	Features	Remarks
1	A masterpiece of human creative genius.	A piece of the history of humankind.	Aesthetic/artistic value plays a role in exchange of artistic trends.
2	An important interchange of human values over time within cultural area on architectural and related developments.	Happens over a span of time or within a cultural area, thus is within a historical framework and periods.	Exchange of artistic trend with respect to monumental arts, town-planning or landscape design.
3	A testimony to a unique cultural tradition or a civilization which is living or which has disappeared.	Concerns cultural history or civilization.	Applicable to virtually all heritage features and sites.
4	Significant stages in human history with outstanding types of building, architectural, technological. Ensemble or landscape.	The outstanding examples of the different types and categories of monuments, ensembles and sites are meant to stand for.	Concern certain historical types of buildings and ensembles have aesthetic dimensions.
5	An example of a traditional human settlement, land-use or sea-use etc	Represents a piece of human history.	Similar to criteria (iv) above and true for settlements.
6	Part of the history of a place Be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance	The association with events is mainly referring to historical events or domicile traditions.	Associated with artistic works and depictions.
7	The major stages of earth's history Contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.	History also plays a role with regard to natural heritage, in the case of this criterion.	Areas of exceptional beauty and aesthetic importance on natural phenomena.
8	The biological processes in the evolution and development of ecosystems.	Are a part of the history of the earth.	Often remote and unique natural features that unveils the history of our planet.
9	An outstanding example of eco-biological and continuing evolutionary processes.	Involves terrestrial, fresh water plants and animals as well as marine life.	These are continuing significant evolutionary processes of all things on earth.
10	Encompass substantially critical natural habitat of biological species.	That should be in-situ as well as being threatened	Most features have scientific and conservation universal relevance.

Note: In most instances scientific value and ethnological or anthropological values could be combined with different criteria as they are being assessed. These OUV are variously presented in the different countries' protection laws as a reflection of their cultural heritage features that are mostly identified as monuments. However, they are usually an expression of the classical historical values, aesthetic/artistic values in their wide-ranging form. Authenticity and integrity are core requirement that are reinforced by the OUV in heritage listing.
Source: Variously adapted from [11, 19, 22, 23].

Table 4.
Framework of criteria for cultural heritages listing based on OUV.

selected features and based on its recommendation the features are treated as being of significance to be protected for the benefit of the global community. **Figure 1** graphically illustrated the various criteria that were used in listing the different heritage features from 1978 to 2007. The Orange colour indicated criteria six (6),

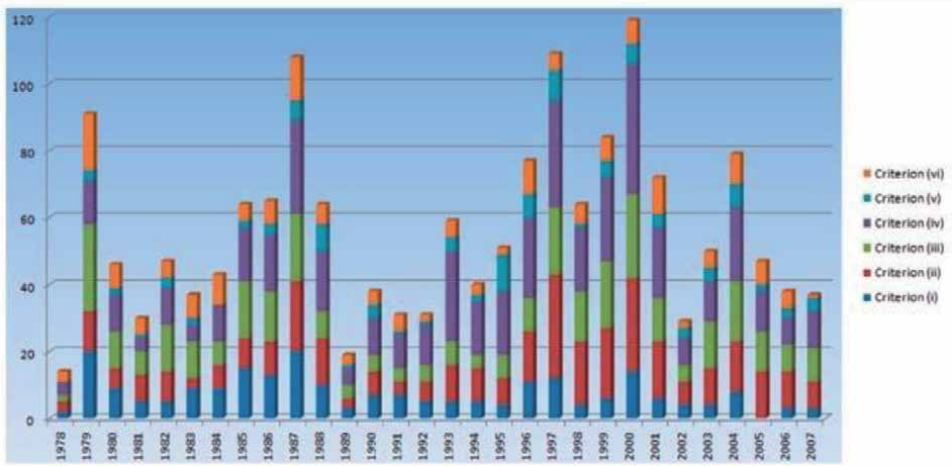

Figure 1.
The different criteria used annually for cultural heritage listing. Source: ICOMOS ([22], p. 16).

Light Blue colour stood for criteria five (5), Purple for criteria four (4), Green was for criteria three (3), while the red colour stands for criteria two (2) and Deep blue stood for criteria one (1). A further look at the graph showed that the most commonly used criteria were six, while the least used was criteria one. However, as a general guide, there are ten (10) criteria that are used, which were derived from the ICOMOS operational guidelines ([22], pp. 13–14). For a heritage feature to be listed, the selected and documented feature is expected to meet any one or more of the value criteria in addition to integrity and authenticity. Since these value criteria deal with significant value in terms of OUV, detail and contextualised further discussion shall be undertaken on the actual placement of value in examining the architectural heritage on other related studies.

However, it has also been opined that though geo-cultural balancing of heritage list may not necessarily lead to an immediate and automatic paradigm shift; it will nevertheless ensure heterogeneity of the list and broader value-based perception for all heritage regardless of the current stereotyped concept of their monumentality [10]. It is the argument that has further inflame the study's passion towards a broad base architectural heritage categorisation that could serve as an Alternative Heritage Discourse (ALHD) that is sensitive to indigenous cultural resources.

6. Intangible cultural heritage listing criteria (convention on safeguarding)

To understand the placement of the thesis argument it will be important to also understand the criteria used in the assessment of intangible heritage features. The basis for the safeguarding of these ICH features is as stated in the convention which is either as representative list or those in need of urgent safeguarding. The selection committee meets and proposed criteria for their listing on receipt of a nomination from member countries and forwards selected ones to the general assembly of UNESCO for ratification [15]. There does not seem to be specific criteria enumerated for the listing of the ICH, indicating that there seems not to be definitive particulars that can be universally applied. It seems the ICH option was just brought up to satisfy agitations rather than setting them on the same pedestal with the tangible heritage features. However, according to the Convention on Safeguarding ICH, article 13(c),

which has to do with other measures of safeguarding; it argued on the need to; "*foster scientific, technical and artistic studies, as well as research methodologies, with a view to effective safeguarding of the intangible cultural heritage, in particular the intangible cultural heritage in danger*" ([15], p. 6).

The convention document, however, gave room for further research and could effectively aid in safeguarding the ICH. The thesis argues that the surest safeguard is to identify heritages (tangible and intangible) as the same and undertake relevant studies that would substantiate its integrative nature. Since the enactment of the Convention for Safeguarding ICH, about 508 elements within 122 countries have been listed as intangible cultural heritage as of 2018 [24]. Accordingly, Nigeria had only four elements listed as part of the ICH, amongst which are Argungu International Fishing and Cultural Festival in 2016, Ijele Masquerade in 2009 and Ifa divination System in 2008, the Oral heritage of Gelede in 2008 (also found in Benin and the Togo Republic) were listed as a representative list of the intangible cultural heritage of humanity. It shows that none is listed due to the need to safeguard them, could then be argued that no ICH in Nigeria is threatened or in danger of being lost that is worthy of being listed. This position will need to be re-evaluated for substantiation or otherwise which, is what this study sort to highlight.

7. Heritage stakeholders and socio-cultural value significance

Stakeholders are those affected and can be influenced by a group's conduct, thereby bearing varied possibilities as a consequence [25, 26]. The varied social perspective of heritage does require adequate understanding considering its diversity; while other concerns of preserving its physical features and ensuring alternative responsive tourism development also need urgent deliberation [27]. Hadjri and Boussaa further argued that the opinion of experts as stakeholders, actors (tenant or owners) of the structures, as well as those who use it either as foreign or local visitors including heritage development partners is critical in determining the suitable heritage management strategy. While the physical and spatial features of heritage are critical, its most significant variable is the social factor that is often a concern with the local stakeholders. Avrami, Mason & Torre [28] stated that the main stakeholders for heritage valuation should include, art historians, conservators, anthropologist, natural scientist as part of broad multidisciplinary team members. Similarly, Mason [29] listed stakeholders to include professionals like architects, planners, curators, tourist and investors. Analysis on tourism and cultural development considers tourist and the community bearers as the key stakeholders [30]. Rojas [31] stated that heritage stakeholders can be considered as social actors and he categorised them into promoters, beneficiaries and financiers. In that instance, he considers the promoters as cultural elites, beneficiaries as local community members and tour operators. Similarly, Rojas considered government and private philanthropists as being financiers. However, in this study, the philanthropist and financiers are considered heritage development partners. Broadly, heritage tourism stakeholders are said to incorporate the host community, facilitators, facility users, design experts and the regulatory agencies as was variously adduced in Oluigbo [32]. Conversely, Smith [2] posited that heritage can be expressed as a form of museum activity involving activity processes and focused on technical experts that can be categorised as institution and government, then communities as well as individuals. The communities according to Smith are made up of the site holders, professionals, researchers, museum and heritage staff. In his argument, Szmelter [33] argued that strategic heritage valuation decisions are dependent on

various stakeholders amongst which are conservators, curators, scholars of different background in culture and science. Similarly, he reasoned that for conservation to be worthwhile, it must be broadly based and emanates from the due social dialogue.

The critical stakeholders in the case of this chapter contribution are categorised as the local community members (Heritage Bearers), the Experts and the Development Partners. Therefore, apt heritage valuation should serve as an impetus for appropriate and sustainable conservation as perceived by critical stakeholders. Imalwa [34] reaffirmed the stated contention by arguing that the prerequisite for resounding heritage conservation and management is the stakeholders with interest and ownership of the site(s). Sroczynska [35] categorised heritage stakeholders as those that monuments should be protected for as owners/users, tourist, residents within heritage area and those with no social usage. Sroczynska's study considers 95.49% of Polish respondents as a tourist, being the most important user of monuments for economic reason, the second significant group of users were acknowledged as the local community bearers at 61.19%. This finding reinforced the significant place of community bearers in heritage management even in highly commercialised (tourist biased) heritage perceptual environment.

Towards having a broad spectrum of stakeholders to benefit from the heritage broader perspective as against Smith [2] argument on AHD based on the views of experts; the study sort to involve all parties to the wider heritage discourse towards enhancing the prospect of arriving at a perspective of True Heritage Discourse (THD) as ALHD. The stakeholders' perspective indicates how diverse the concept is, as it is viewed differently by the various groups and individuals. For the chapter contribution, however, the stakeholders are categorised into the Heritage Bearers (indigenous communities), the Experts and the Development Partners as shown in **Figure 2**. In the stakeholders' categorisation, it indicated the critical place of the heritage bearers at the base of the pyramid and the supporting role of partners on these heritage features and site. The experts often also referred to as the professionals sit at the peak of the pyramidal jigsaw. Here the professionals' evolution of the perceptual opinion of the pyramid base (Bearers), and the development partners that will provide the raw data and serve as the real custodian of the heritage for current and future generation. Therefore, stakeholders in this study will serve as the major repository of research information considering their interest and possible benefits from the identification, documentation and conservation for tourism valorisation and development of the heritage features within each study area. The variance of the public opinion with that of the professional has often been observed in virtually all fields of endeavour, however effective management of stakeholders in any project can give excellent result as was demonstrated by Charles Birnbaun article on managing change and modern landscape indicated how public opinion prevail over that of the experts' proposition in heritage development options [36].

Equally, Charlottesville Mall in Virginia was designed by Halprin with inclusive community participation in the 1970s, however, due to years of neglect the city council mould remodelling the mall to remove the signature bricks. The proposal was strongly opposed due to public outcry and they ultimately got what they wanted [36]. It is therefore pertinent to have a more holistic strategy where the views of all stakeholders are sort at the inception of projects that ensures community participation in the project planning and its implementation. For this chapter review, therefore, to be contextualised the varied stakeholders' preferences are placed appropriately to ensure the sustainability of the resource base and the continual beneficiation for all key stakeholders within any specific cultural landscape.

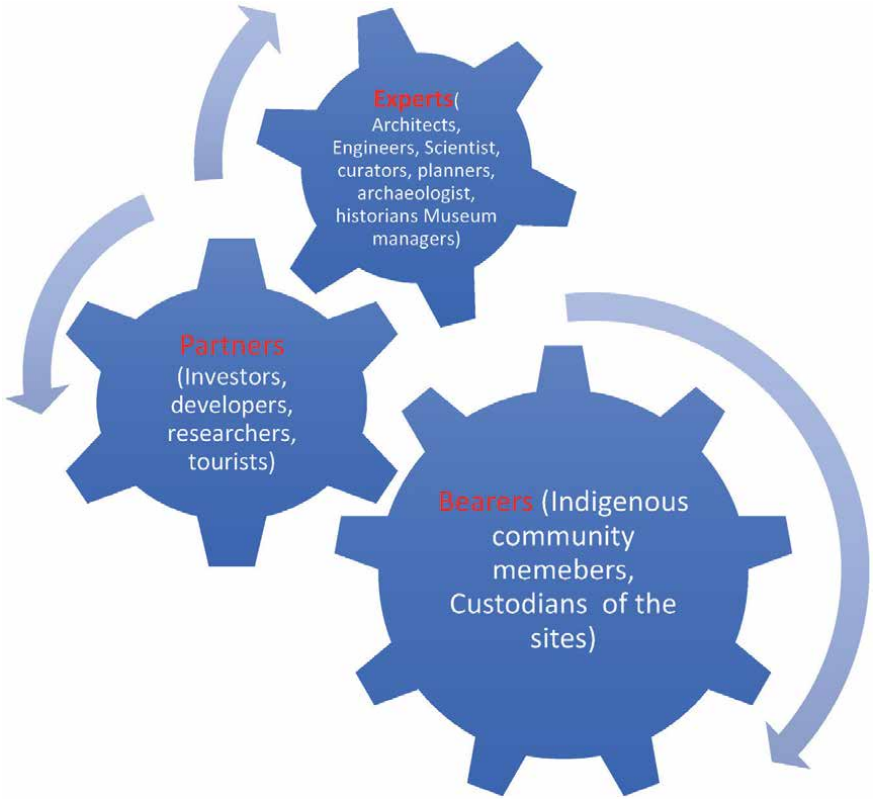

Figure 2.
Stakeholders categorisation for integrated alternative heritage discourse (ALHD). Source: Adapted from [2, 27–29, 33, 34].

8. Indigenous Architectural Heritage Sites and Features in Sub-Saharan Africa

Sub-Saharan African is replete with assortment of architectural heritage sites, features and the driving forces of their socio-cultural essence. Whether they are categorised as tangible or intangible, cultural, natural or mixed and in some instances rural or urban, their design, development and continuous evolution over time is anchored on the socio-cultural process. In Africa, particularly the Sub-Saharan areas, the architectural heritage within their indigenous settlement has been and continuous to remain the community social process. It has also been affirmed that for their sustenance, their social process, must of necessity be maintained through the process of sanctuarisation, sacralisation, consecration and development of conventions in each community [37, 38]. The lone contemporary conservation process of preservation, restoration, repairs, maintenance and treatment, adaptation and reconstruction cannot protect the indigenous African heritage across generations [39–41]. The ineffectiveness is due to the fact that African indigenous heritage is not a mechanical process; it is first a communal, emotional and spiritual essence then a technical procedure with involvement of the indigenous bearers. It is worthy to note that once the inert and lethargic socio-cultural force of the heritage is lost, its dynamic vigour for existence cannot be sustain amongst African societies. Subsequently such heritage features are gradually left or abandoned to deteriorate, decay, become destroyed and often lost to future generation. The integrated nature of indigenous architectural heritage sites and features are as further graphically illustrated in **Table 5** for better aesthetic appreciation.

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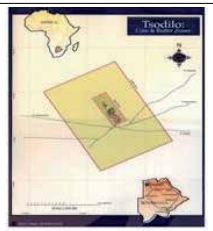
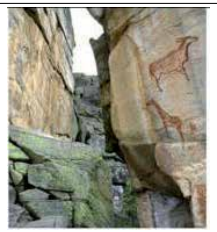
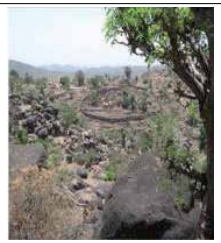
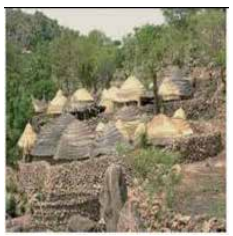
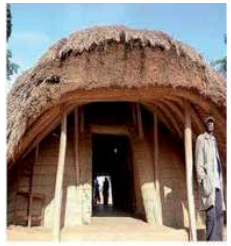
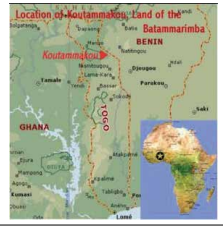
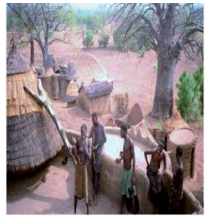
Nature & type of heritage (category/domain)	Listed cultural heritage sites & features	Selected feature layouts and plates			Remarks
Cultural Landscape made up of four chief hills with collection of rock art, rock shelters, depressions and eaves.	Botswana (Tsodilo Hill) Listed during the 25th WHC session held in 2001 based on criteria i, iii & iv.				The site has religious and spiritual significance to the indigenous people. It was observed to be a place of rituals animal sacrifice about 70,000 years ago by the San people of the Kalahari Desert.
Cultural Landscape fortified royal settlement on one of the twelve Imerina hills.	Madagascar (Royal hill Ambohimanga) Listed in 2001 based on criteria iii, iv & vi having the royal settlements				Place of worship and pilgrimage for over 400 years since 15th century by the Merina people. An archaeological site, ruined city, burial sites and sacred places.
Natural and Cultural Landscape on the escarpment within the 300M height and 150 KM long sandstone cliff	Mali (Bandiasara Escarpment) Listed in 1989 based on criteria v & vii. The Dogon Toucouleur Empire was preceded by the Tellem.				Has archaeological, geological xtics. Earth-brick and thatch dwellings on high cliff for security and climatic comfort. Inhabited since the 3rd century, Dogon people arriving in the 17th century AD.
Cultural Landscape on the Mandara mountains of Madagali LGA in Adamawa State, Nigeria	Nigeria (Sukur) Listed in 1999 based on criteria iii, v & vi. The Sukur people are headed by a political and religious leader the Hidi.				Known for iron smelting technology, since 16th century. Build with dry stones, mud walls, granaries, thatch and has terrace farmlands, paved walkways, sunken animal pens.

Nature & type of heritage (category/domain)	Listed cultural heritage sites & features	Selected feature layouts and plates			Remarks
Cultural Landscape on the Kasubi, Uganda.	Uganda (Kasubi, 2001) Listed based on criteria i,iii,iv & vi in 2001. Tombs of the Bagundu Kings housing four Kabaka's as a mausoleum.				Ancient civilization of the Baganda people since 13th century, representing their spiritual heart. Destroyed by fire in March 2010, being reconstructed based on traditional skills and craftmanship available
Cultural Landscape at the Osun Osogbo Sacred Grove, Osun State, Nigeria.	Nigeria (Osogbo Sacred Grove) listed in 2005 based on criteria ii, iii & vi. Serves as the unifying factor of the people.				Has more than 700 years religious history and practices amongst the Yorubas of Osogbo. Encompasses traditional cleansing, concern with art in drumming, dancing, music & weaving.
Cultural Landscape of Koutammakou, Togo along Benin North-Esta border in West Africa	Togo (Koutammakou) Listed based on criteria v and vi, serves as an environmental and belief system village architecture.				Mud built 'takienta' integrated complex linked rooms, upper level floors on flat roof as homesteads. Has conical shrines at entrances, cylindrical mud towers, thatch roofs

Source: Adapted from [42–49].
It is worthy to note that most of the highlighted listed landscapes in Sub-Saharan Africa are typically integrated together covering, cultural, natural and mixed features and in some instances the intangible cultural rituals, festival and artforms keeps the site relevant in the past and in some instances even currently. This further reinforced the nature of heritage sites, their features and cultural festivities as an expression of the Alternative Heritage Discourse (ALHD) perspective being conversed in this chapter made up of tangible and intangible features typical of African heritage dimensions.

Table 5.
Selected world heritage sites of cultural landscapes in Sub-Saharan Africa.

9. Alternative heritage discourse (ALHD) template for Sub-Saharan Africa

Current and future heritage discourse perspectives must be holistic, integrative and an all-encompassing framework to guarantee the sustainability of all peoples and nations' socio-cultural value significance of their bequeathed patrimonial allotments of indigenous architectural heritage. Most early studies of the indigenous architectural heritage of Africa seems to consider them as not worthy of serious research and or critical discourse and examination [50]. Prussin argued that the model of permanence base on Eurocentric architectural ideals should be a challenge. He rather argued that indigenous architectural placemarks are considered sacred through ancestral abode. Therefore, the indigenous settlements sacredness is critical in African socio-cultural value perceptual preferences and their significance of place and its architecture. The indigenous architectural heritage perspectives here cover the heritage, their conservation, alternative tourism prospects within the socio-cultural prism as the context for ALHD.

The prevailing loss of indigenous architectural heritage culture, knowledge and environment in Sub-Saharan Africa due to western imposed values is indeed a cause for concern [51]. Scott further argued that westernisation has striped most of SSA of their cultural pride particularly for architecture that had earlier been quite sustainable. The study by Scott, therefore, encouraged an African architecture that is considered aesthetically appealing, environmentally responsive, culturally mesmerising and adapts to the socio-economic realities of the people. Such a projected future for African architecture can however not be achievable if the existing heritage features are abandoned or left to decay. As such, the African heritage features will not be available for further research towards being adaptable for contemporary requirements. Ndoro, Mumma and Abungu [52] likewise, argued that heritage definition in SSA goes beyond the visible immovable features, as it incorporates different facets of culture, mode of communication, spiritual belief system, sacred groves, rivers and forest including their monuments. Indigenous heritage studies were said to have been reinforced after the 2002 Johannesburg World Summit and the commitment of governments to preserving their heritage.

Currently, heritage studies are established on the UN 2030 agenda on Sustainable Development Goals (SDG-11) that is anchored on "strengthen efforts to protect and safeguard the world's cultural and natural heritage" ([53], p. 12). Similarly, this heritage goal is set to pursue in addition the challenges of poverty, social justice, climate change that guarantee the preservation of the ecosystem. Therefore, this study is premised on World Heritage Sustainable Development Policy (WH-SDP) as well as the African Union's 'Agenda 2063: The Africa We Want', where local community participation and heritage resources are to be utilised for enhanced peace and prosperity in Africa ([54], p. 22). Mainstreaming of WH-SDP that is based on regional and national policies is considered pivotal to this study. Policy statements are to be such that the key stakeholders as bearers, experts and partners are considered as a critical part of the heritage management process the local community. World heritage discourse based on SDG's was anchored on three dimensions of environment, economics and society under peaceful and secure context [53]. Moukala and Odiaua further argued that despite African heritage place in its development, the complex perceptual and relational features are not adequately tackled; particularly if viewed in the setting of centralised national resource management against diverse local community's interest.

Myriad of challenges were further highlighted by the Index of Economic Freedom [55], which contended that Sub-Saharan Africa is ranked amongst the lowest in economic freedom leading to the erratic transformation of most sectors. Therefore, for

Sub-Saharan Africa where current heritage listing criteria does not seem to have been adaptable enough; the intangible is being argued as the basis for the tangible [56]. In fact, for most African societies where the traditional practices are still prevalent, dead ancestors are an integral part of the living generation of believers in terms of their folklores and ritual practices indeed even their built settlement habitation [57]. Similar arguments are being advanced by several African scholars towards reasserting the Afrocentric viewpoint and voice in global heritage discourse [58, 59]. Africa heritage components, its list as approved by UNESCO and perspective of discussion is contentiously down the piking order despite being the cradle of human civilization. This reality despite abounding socio-cultural resources requires critical research for appropriate placement of the discourse and subsequent acknowledgement for more heritage listing in Sub-Saharan Africa and indeed Nigeria.

Conservation is significant and urgently required for Africa, particularly Sub-Saharan African. Catering for African heritage towards reasserting its relevance in global discourse is best presented in Pan African cultural manifesto where it was argued that;

> *"The conservation of culture has saved the various African peoples from the attempts at erasing the history and soul of Africa's peoples... and if it (culture) binds humans together, it also impels progress. This is the reason why Africa has gone to such great lengths and taken such care in recovering its cultural heritage, in defending its personality and tending to the flourishing of new branches of its culture" [60].*

The soul of the African people has remained and continues to be reflected by their heritage features, either as an artefact or built structures. It is these heritage features and their impact that bound the African people together and will determine their destiny amongst contemporary societies. The current reawakening of the socio-cultural values of the African societies has provoked a rethink on the imposed culture and architectural edifices across the continent. For securing the future of African people and thus their heritage, there is the need for contemporary heritage discourse to be further broadened beyond the categorisation of tangible and intangible heritages. Rather, the heritage discourse should be an integrated whole that evolved into features with physical and spiritual impact on our environment.

Alternative tourism is a form of sustainable tourism and specifically concern with the responsive utilisation of heritage resources, and in this case, are the resources of indigenous communities within the Sub-Saharan Region of Africa. Van Zyl [61] argued on the significant place of tourism in the conservation of cultural heritage in South Africa. He further argued that global tourists are craving for responsive tourism that support conservation of cultural and natural resource. The preservation of these resources could serve as an impetus for cultural identity and sustenance. Nnabuogor [62] stated that alternative tourism is mainly an individualised plan to gain experiences within a host community or setting about their culture and environment. Alternative tourism emphasises social, natural and indigenous communities value systems. Here the alternative form of tourism provides opportunities for both the host and the tourist in a sustainable manner.

Moukala and Odiaua observed that Africa being the cradle of human civilization and blessed with abundant natural and cultural heritage is not proportionately represented on the World Heritage List. Therefore, at the 2016 Tanzanian conference, where the Ngorongoro Declaration on African sustainable development of heritage features was made has now become the platform of most sustainable heritage tourism development [53]. These heritage features with the distinct architectural identity indeed form the essence of socio-cultural tourist arrivals. Thereby serving

as a medium for identifying with the African culture, the built heritage and the socio-cultural landscape of the indigenous communities.

Nigeria is one of the four African countries that joined the WHC at its inception in 1974 along with Sudan Niger and DR Congo, however, their proportionate heritage features amongst other continents that have been listed are insignificant [63].

Ifechukwu [64] also posited that African heritage perspectives and their socio-cultural value concepts are premised on extended family, relationships emphasis, communal affluence, mutual concern, respect for elders, compromise, contest and hero adoration. Similarly, is the argument for the human hierarchy of needs being cyclically interconnected rather than hierarchical as postulated by Maslow [65]. It is worthy to contend here that with such a belief system Africans have been managing their resources (tangible and intangible). This has been from time immemorial basically through oral tradition, which is a form of intangible heritage. Therefore, architectural heritage value is considered as both an enduring belief system and an end-state of human existence [41, 66, 67].

Base on the critical variables review in line with the ALHD perspective, the chapter, therefore, proposed an ALHD that is in line with **Figure 3** as the framework within which viable discourse on alternative heritage could be sustained. Alternative Heritage Discourse (ALHD) template perspectives are to be strictly base on critical stakeholders' opinions and preferences, particularly the indigenous

Figure 3.
Alternative heritage discourse template for Sub-Saharan Africa. Source: Authors desk research (2019).

communities who serve as the heritage bearers within a cultural landscape, anchored by the experts and supported by the development partners. The apex place of experts in decision making on alternative heritage perspective must be review and the bearers serve as the base of the process pyramid, with partners at the centre and experts at the zenith in processing resource base of the community. However, in exploiting and developing conservation options for any specific site, the process is revised, such that it could start with the expert through the partners and end with the bearers. In other words, in the ALHD perspective, the heritage discourse starts and end with the bearers. This template could encourage sustainability of the resource base and its active sustenance by the bearers for the benefit of all partners under the guidance of the expert.

Due to the recent critique of the OUV concept of authenticity ICOMOS-ISCARSAH (2021) in a webinar on authenticity and reconstruction stated that the question of authenticity is a recurring concern in the discourse of heritage and its construction and require continuous critical dialogue for a productive position. Historically, the Venice charter of 1964 projected a Eurocentric view on the material component of heritage. By the Nara document on the authenticity of 1994, it affirms the strategic place of culture in heritage authenticity discourse. Burra charter of 1999 brought about the critical qualities of heritage as intangibles. It clearly shows the evolving discourse and concern demonstrated concerning diverse concern by heritage professionals. As the authenticity question become open to different international views, perspectives are more dynamic and far from the supposedly and imposed roles to determine authenticity for ascertaining OUV of heritage. Material originality definition of wood, masonry and earth for heritage authenticity becomes a challenge given the immaterial location, culture, spirit and form of heritage. It seems that considering authenticity as a "one size fit all" has hit a dead-end in heritage discourse. Therefore, it would be sustainable to provide authenticity understanding in different cultures that could reinforce or question viewpoint on any heritage conservation perspectives. Hence the proposed template for Alternative Heritage Discourse within indigenous cultural landscape communities of Sub-Saharan Africa.

10. Conclusion, recommendations and future ALHD research perspectives

In conclusion, the chapter review contribution has been able to expound the spring board of AHD and the foundational deviations from its set out objectives of asserting the logic of each heritage. The transition of heritage discourse from objective to subjective gradually however merged into one as AHD that birth the first charter of 1964. However, the AHD perspective is at a threshold that will require collective and holistic proponents of the ALHD viewpoint to adduce relevant discourse options for transgenerational sustainability of the heritages. The study further surmised that there is no heritage without the intangible process which could create a tangible product in some instances while in others it is sustained at its immaterial form driven by the people traditions and customs. Socio-cultural value significance therefore should remain the main driving force of true heritage discourse amongst professionals based on indigenous societies and settlements in Sub-Saharan Africa within the ALHD perspective. The advocated perspective should henceforth drive the revised charters, recommendations, principles and protocols of heritage globally concerning their identification, documentation for conservation and listing. Such positions could ensure sustainable heritage management now

and in the future amongst indigenous communities of Sub-Saharan Africa. The study, therefore, recommends as follows;

a. The concept of ALHD should be jointly developed in consultation with all stakeholders within the relevant regional and sub-regional organisation. It would bring about a broad-based contribution that could act as foundational material for ALHD integration into mainstream heritage discourse perspectives.

b. Professional as key stakeholders are to serve as moderators of such discourse with other relevant stakeholders rather than being the drivers. This is important to avoid falling into the same mould of AHD, where professionals are considered as experts and their opinion serve as the mainstay for heritage-based activities.

c. The significant place of the socio-cultural value of heritages in consonance with the bearers and partners contribution should be specifically treated as a central concept towards the authenticity of indigenous architectural heritage within Sub-Saharan Africa.

d. Responsive alternative form of tourism concept should be the platform for tourist arrivals within the Sub-Saharan Region as a sustainability strategy. Essentially all stakeholders mutual benefit analysis should be the main drivers of the alternative form of tourism rather than the mainly monetary profit.

e. Conservation strategy of indigenous architectural heritage should incorporate traditional and conventional systems within heritage sites and features. Here the traditional systems of consecration, santuarisation, sacralisation and conventions development should act as the drivers for implementation of conventional strategies of preservation, repairs, treatment and maintenance, restoration, adaptation and reconstruction.

f. In identification, documentation, conservation and tourism development, all stakeholders should be involved from inception to the closing of each project. Here while the bearers should form the base for the initiation of heritage documentation, then the partners and ultimately the experts. During implementation the professionals and government agencies could lead the way, then partners and ultimately the local bearers in execution, as an integrated bottom-top and top-bottom approach.

In future research, the proposed ALHD template could encourage the development of an integrated framework charter that encompasses the thematic, chronological-regional and typological framework perspective of heritage debates as a holistic strategy that is beneficial to all stakeholders. It could be a charter that could guarantees the sustenance of indigenous architectural heritage within Sub-Saharan cultural landscapes. It is expected that further reviews and empirical studies will be undertaken to substantiate the proposed template or create its variant for the continuation of the Alternative Heritage Discourse amongst indigenous communities of Sub-Saharan Africa that should ultimately create an acceptable charter for use in conservation and listing of its unique cultural landscapes as integrated unit(s).

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Chapter 14

Novel Ways of Discovering, Capturing and Experiencing Cultural Heritage: A Review of Current State-of-the-Art, Challenges and Future Directions

Dimitra Pappa and Constantin Makropoulos

Abstract

The present chapter investigates the **emerging paradigm of cultural heritage experience**, as shaped by the continuous advances in information technologies. Recent years have seen the growing **digitisation** of cultural heritage, leveraged by innovative information technologies (imaging technologies, multimedia, virtual reality etc.). **Advanced digitisation, and digital preservation and accessibility** have been instrumental in transforming conservation and scientific research methods in the field of cultural heritage, as well as people's experience of cultural heritage assets, relics, and monuments. Digitisation and **immersion technologies** are already in use in the context of cultural tourism in museums and on location. At the same time, a manifold of new applications and services can be generated from the adoption and adaptation of relevant technologies already applied in other sectors (e.g. 2D/3D digital scanning technologies applied in the construction industry). The present chapter will provide a thorough review of relevant digital technologies and existing work in the field, highlighting important research efforts and achievements; and will discuss the current challenges and promising avenues for future work. Following a literature review methodology, our research will provide a critical appraisal of carefully selected work from recent scientific literature and contribute to the systematisation of the current knowledge in the field towards the identification of key challenges and the extraction of new insights in terms of potential for practical applications and future research directions in the area.

Keywords: cultural heritage, heritage experience, virtual heritage, digitisation, immersive technologies

1. Introduction

UNESCO [1] defined **cultural heritage** as "the entire corpus of material signs either artistic or symbolic, handed on by the past to each culture and therefore to the whole of mankind". It thus represents "the legacy of physical artifacts and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations" [1].

Ramos & Mafé-García [2] explain that cultural heritage includes "physical artifacts and intangible attributes of a place or society that are inherited from past generations". Cultural Heritage is thus an expression of the ways of living developed by a community and passed on from generation to generation, including customs, practices, places, objects, artistic expressions and valuesThis includes **both tangible and intangible elements,** namely (a) tangible heritage assets, such as buildings, monuments, archaeological sites and locations of cultural significance, books, material objects including works of art (paintings, sculptures, drawings, prints, etc.), objects of the decorative arts (furniture, glassware, textiles, ceramics, etc.) and other artefacts, landscapes and natural heritage; and (b) intangible heritage assets, such as oral traditions, arts, rituals, folklore, language, and knowledge [2–4]. **Intangible cultural heritage** is described as a set of "practices, representations, expressions, as well as the knowledge and skills including instruments, objects, artefacts, cultural spaces" that are recognised as part of national heritage [5]. Cultural heritage is an evolving concept that experiences continuous reinterpretation and extension. Rather than representing concrete objects or artefacts, cultural heritage is increasingly regarded as a process, featuring a complex set of meaning, values, associations and related concepts [6].

The recently introduced term "**Digital cultural heritage**" describes cultural resources that were created in digital form (for example digital art or animation) or were digitised as a way to preserve them (including text, images, video and records) [7].

UNESCO [1] further notes that cultural heritage is not only a source for business and economy, but a fundamental condition for the maintenance and development of society and its economy. In terms of value, cultural heritage assets comprise both economic and cultural value. Cultural value is a complex concept that spans several dimensions: aesthetic, spiritual/religious, social, historical, symbolic and authenticity value [8]. Accordingly, "the **experience** of cultural heritage is varied according to the person's realm of experience, the setting of the experience, and the intent of the experience from the point of view of the participator and the provider" [9]. A visitors' overall engagement and satisfaction, and quality of experience are interlinked with the attributes of the heritage site [10, 11].

The most readily accessible experience of cultural heritage is in the realm of **tourism** [9]. For the tourism industry, **culture and heritage** represent an important asset for generating economic value. New types of tourism offerings have emerged, drawing on culture and heritage, and focusing on aspects such as **a site's built/historical heritage, popular culture, living culture, shared culture, cultural events, culinary culture etc.** The European Travel Commission (ETC) describes international cultural tourism as "a movement of persons to specific cultural attractions, such as, heritage sites, artistic and cultural manifestations, arts and drama to cities outside their normal country of residence". With tourists seeking more diversified, engaging and intellectual experiences [12], the tourism sector is shifting towards more experience-based products [13]. Culture **emerges as a key motivation for travelling among tourists.** Heritage tourism is growing in popularity, transforming cultural heritage into one of the principal attractions of a tourism destination and increasing the importance of cultural heritage preservation and valorisation.

McKercher et al. [14] stress the complexity of cultural tourism, as reflected in the variety of perspectives adopted for its definition: tourism-derived, motivational, experiential and operational. ICOMOS [15] describes cultural tourism as a form of tourism whose object includes the discovery of monuments and sites. Richards [16] defines **heritage tourism** as 'the movement of persons to cultural attractions away from their normal place of residence, with the intention to gather new information and experiences to satisfy their cultural needs'.

There are different types of **"cultural tourists",** in terms of the segmentation of these in heritage destinations [14, 17]. Cultural tourism is shaped as a combination of four elements: tourism, use of cultural heritage assets, consumption of experiences and products and the tourist [18].

Cultural tourists in growing numbers pursue an in-depth appreciation and understanding of different aspects of the culture and heritage of the places they visit. Cultural heritage tourists are in search of authentic experiences associated with a variety of cultural traits that are linked to distinct geographic locations. Dallen [19] highlights this diversity, stating that cultural heritage tourism "encompasses **built patrimony, living lifestyles, ancient artifacts and modern art and culture**". The importance of culture and the importance of the cultural experience may also vary among visitors [20], the scale and depth of the information that the tourists have regarding this place likewise.

Recent years have seen the growing digitisation of cultural heritage, leveraged by innovative information technologies (imaging technologies, multimedia, virtual reality etc.). Advanced digitisation, and digital preservation and accessibility have been instrumental in transforming conservation and scientific research methods in the field of cultural heritage, as well as people's experience of cultural heritage assets, relics, and monuments. Digitisation and immersion technologies are already in use in the context of cultural tourism in museums and on location. At the same time, a manifold of new applications and services can be generated from the adoption and adaptation of relevant technologies already applied in other sectors (e.g. 2D/3D digital scanning technologies applied in the construction industry).

On the consumer side, technology is driving change in lifestyles. New forms of tourism are emerging in the place of conventional tourism. Alsos et al. [13] note a transition of the tourism sector towards more experience-based products. Experiences are inherently personal. When a person buys an experience, they pay for a memorable event staged by the experience provider to engage them in an inherently personal way, on an emotional, physical, intellectual, or even spiritual level [21]. Stamboulis, and Skayannis [22] further explain that in this experience-based exchange the tourist enters into a multifaceted interaction with the actors and the setting of a narrative staged by the local community.

The United Nations World Tourism Organisation [23] concluded that "Culture and tourism have a symbiotic relationship". This symbiotic relationship is increasingly facilitated by information and communication technologies. Overall, the economic valorisation of cultural heritage through tourism implies incorporating cultural heritage into the tourism supply [24], which means viewing cultural heritage as a component in the production of heritage-related tourism products and services. Given the high market interest of cultural tourism, local destinations strive to leverage what makes their societies unique, promote the region's cultural identity, in order to boost economic growth. According to Opačić [24], tourism valorisation of cultural heritage includes several steps, starting with the identification of cultural heritage suitable for conversion into tourism attractions.

Communicating cultural heritage to visitors in understandable and engaging ways is challenging, yet it represents an increasingly important aspect of tourism destination marketing. Presently, the relationship between tourism and culture is transformed by the affordances of new technologies. Advanced learning technologies can accommodate the provision of value-added cultural experiences to tourists, improve representation, engage visitors with content in innovative ways, support cultural revitalisation and increase the overall attractiveness of heritage sites. Cultural locations and spaces can be enriched by scanning and overlaying virtual annotations on top of these places. Digital applications can provide cultural tourists

with fast knowledge acquisition: immediate cultural location-based information of specific points of interest.

Advanced digital technologies for cultural heritage management, study and analysis, conservation, restoration, and preservation, access and communication, are transforming conservation and scientific research methods in cultural heritage, as well as people's experience of cultural heritage relics, monuments and events. At the same time, digital technologies are enhancing the experiential and interpretive dynamics of the cultural heritage representations and creating innovative environments for consumers to discover, capture and experience cultural heritage and events, thus promoting the creation of new value chains for tourism through the digitisation of cultural heritage. Integral to this is the combined use of innovative digitisation technologies and affordable consumer electronic equipment, which is making innovative cultural heritage experiences accessible to all.

Following a literature review methodology, in the subsequent sections, our research will provide a critical appraisal of carefully selected work from recent scientific literature and contribute to the systematisation of the current knowledge in the field towards the identification of key challenges and the extraction of new insights in terms of potential for practical applications and future research directions in the area.

2. Methodology

The methodology applied for this research was exploratory in nature, based on an extensive review of the available literature. In recent years, there has been an increasing number of studies linking cultural heritage with digital technologies. To offer a broad overview of this emerging research domain, a review of academic literature was undertaken to examine relevant publications in the Web of Science database. The purpose of this study was to review the existing literature to describe the state-of-the-art in key areas of interest and to identify key challenges, in order to extract new insights in terms of potential for practical applications and future research directions in the area.

Scope of literature review:

- Literature sources: all corpora included in the Web of Science database
- Timeframe: 2017–2021 (covering all eligible literature in last 5 years)
- Geographical coverage: all-inclusive
- Literature selection: the literature search (covering a time window of the last 5 years) used two groups of keywords. The first group included the terms "heritage experience". The second group referred to ADR detection and included the terms: "Technology", "Digital", "Virtual" etc. Thus, the literature search query for article selection had the logical form of: {heritage experience} AND {digital technology, or equiv.}.

An electronic search of Web of Science (3 June 2021) was performed using the following search string: *[(heritage experience)] AND [(Technology) OR (Digital) OR (Virtual) OR (Immersive) OR (Augmented) OR (Scan) OR (3D) OR (WEB) OR (PORTAL) OR (Application) OR (Mobile)]*.

The initial search resulted in a total of 824 articles. All search results were subsequently scanned, based on the title and abstract, to determine whether the

respective article should be included or not in the study. Following screening, 246 documents were excluded as they were not directly linked to the specific topic of the present study. This resulted in a final collection of a total of 578 articles. Additional records were identified through their list of references and other sources. Extracted information included [25] article title, author and publication year; [26] area of focus; [13] technology; [21] quality-related information; and [9] results and significant findings from the application.

We also reviewed research action under the EU Horizon 2020 programme (2014–2020) [27]. The Horizon 2020 programme featured initiatives aimed at the preservation and valorisation of cultural heritage, specifically targeting areas such as the curation of digital assets and advanced digitisation, cost-effective technologies for advanced 3D modelling, Virtual Museums etc. [7].

With regards to museums, the study revealed a strong correlation with digitisation, followed by a strong interest in immersive technologies (virtual/augmented reality) and the development of specific applications for museum visitors to experience the exhibits. Mobile access is also among the focus points, while 3D representation is gaining ground. Less discussion is made about web portals in the present time frame, as this was strongly pursued in earlier times.

The most significant insights drawn are outlined in the following sections. Section 3 provides an overview of the study results, Section 4 discusses the application of advanced digitisation technologies for powering cultural heritage experiences, while Section 5 summarises the current challenges and examines the way forward.

3. Results

With regards to the application of digital technologies in cultural heritage, the study revealed a broad scope: (a) to promote the preservation of cultural heritage and assist scientific research, and (b) to enhance the communication of digital heritage. The following Figure (**Figure 1**) provides an example of key applications of advanced digitisation technologies and applications in the context of cultural heritage. Three main areas have been identified: preservation, research on, and communication of cultural heritage. The first two relate to making sense of and

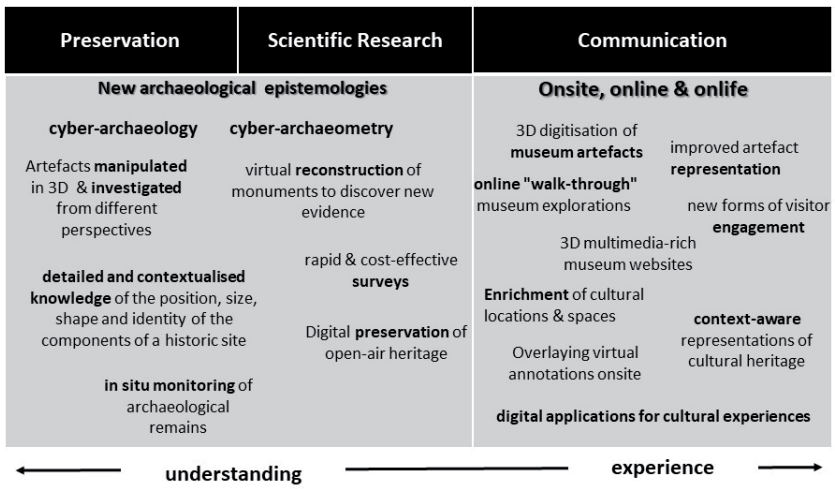

Figure 1.
Key applications of advanced digitisation in cultural heritage.

interpreting cultural heritage. The latter is about how cultural heritage is divulged and experienced.

Accommodating cultural heritage experiences mainly falls under communication of cultural heritage and cultural tourism, but also draws from advances in cultural heritage preservation. The study revealed that digital technologies are reshaping the cultural heritage value chains, by affecting both the **back office**, where the cultural resources originate and the **front-end**, where the **consumption of cultural heritage experiences** takes place. Consumption itself can flow through different communication channels. Discussing museum experiences, Simone et al. [28, 29] identified four main areas, in which digital transformation is taking place: [25] in the **back-office**, referring to the preservation of cultural heritage; [26] **onsite**, relating to the quality of the museum experience; [13] **online**, referring to how the museum experience can be extended beyond museum doors; and [21] **onlife,** referring to the creation of wider, hybrid museum experiences.

In the following section we discuss critical developments in the back office and front end.

4. Discussion

4.1 Back-office capabilities

The research results identified several novel digital transformation approaches to improve the preservation of cultural heritage in the back-office. Focal point is the digital preservation of cultural heritage.

4.1.1 Digitisation and archiving

Digitisation and archiving constitute the foundations for the development of virtual heritage applications and services. Recent advancements in information and communication technologies have made it possible for heritage artefacts to be preserved and made available in digital form. Already in 2011, the European Commission's Recommendation on the Digitisation and Online Accessibility of Cultural Material (2011/711/EU) emphasised [30] the importance of bringing Europe's cultural heritage online, for improving access to and promoting the re-use of digitised cultural heritage material, e.g. by the creative sector. Recent years have seen a growing trend towards the **digitisation** of museum collections, library and archival cultural resources (such as manuscripts, books, and journals), sound and audiovisual heritage, immovable cultural heritage (such as monuments, historical buildings and archaeological sites), as well as **intangible** cultural assets, such as the living arts, and traditional folklore culture (traditional dances and folk customs) [31].

Cloud computing technologies facilitate the aggregation, storage and reuse of digital content. A wide array of national and international, thematic or domain-specific cultural heritage **aggregators** have emerged, allowing for joined up access to cultural resources. This includes digital platforms, applications and repositories that bring together cultural collections from cultural institutions through virtualisation. Europe's digital platform for cultural heritage, **Europeana** provides access to over 50 million items, (including image, text, sound, video and 3D material) from the collections of over 3000 libraries, archives, museums, galleries and audio-visual collections from all over Europe. Similarly, the **Google Cultural Institute** provides access to cultural artefacts from 1400 cultural institutions in 70 countries and to more than 3000 online exhibitions curated by experts. Its services include

1800 Street View captures of famous museums and landmarks that allow users to immerse themselves and get a 360° view of these places from anywhere, using their PCs, laptops or mobile devices.

Nonetheless, challenges to aggregation continue to persist, referring to issues that range from the lack of granular and rich descriptive metadata [32], to technical interoperability and copyright [33, 34].

Organised memory institutions (e.g. museums, libraries, archives) hold disparate collections of heritage resources, in terms of format, organisation and storage. Digitisation efforts are often fragmented and ineffective, with smaller organisations lacking the knowledge and resources needed, and further being unable to attract significant visibility to impact tourism and the local economy. To ensure the quality of digitised materials, digitisation standards and specifications, as well as guidelines concerning interoperability and metadata descriptions. Several domain-specific standards have been adopted, such as LIDO for museums, EAD for archives and METS for digital libraries. Led by Europeana, standardisation and common approaches for content and metadata management represent an on-going priority for Europe. The Europeana Data Model (EDM) is a cross-domain metadata standard that enables content interoperability, exchange and aggregation.

The need to improve the quality of cultural heritage metadata and collection management systems (CMSs) is stressed [35]. Metadata enrichment through crowdsourcing annotation services [32] and machine learning techniques [36–39] is recommended.

Digitisation goes beyond the transposition of analog objects into the digital space. A key concern is the **digital readiness** of cultural heritage institutions, concerning their capacity to adapt and adopt disruptive technologies in their practices. This implies a profound transformation of their internal processes and calls for a holistic approach at different levels in the institutions (organisational, operational, human resources, etc).

Cultural heritage is not limited to culture repositories and digital collections. Intangible cultural assets include the living arts, traditional folklore culture and crafts [40]. Furthermore, the largely untapped potential of cultural heritage embedded in individual memory needs to be harnessed through citizen's collection and interpretation of digital heritage [41–43]. Nowadays, we are witnessing a transition towards social engagement in culture that is driven by the rise of digital content production and digital connectivity. Crowdsourcing and digital storytelling can help capture the **living cultural heritage** of different communities or groups, in terms of practices, representations, expressions, knowledge, skills [43, 44]. The collection and archiving of a community's or region's cultural memory further involve raising public awareness about the importance of their cultural heritage and gearing up citizens' knowledge about and access to this heritage. **Social platforms** can provide the means for citizens to share their local knowledge and everyday experience with others, together with the contribution of cultural institutions [41, 42].

4.1.2 Advanced digitisation technologies

In recent years, numerous initiatives have been launched, involving the modelling and rendering of digital cultural heritage in 3D for research and preservation and/or communication purposes. Cultural heritage artefacts that traditionally were presented in two-dimensional form are increasingly captured, modelled and visualised in three dimensions and/or in 3D virtual environments [45]. The 3-D model can be realised from physical objects (according to a "reverse modelling" process) or directly assembling 3-D digital forms. It could provide a photorealistic image or

a symbolic representation of the original artefact, depending on the object and the scope of the representation. Advanced digitisation technologies have been instrumental in transforming conservation and scientific research methods in cultural heritage, as well as people's experience of cultural heritage relics, monuments and events [28, 29, 46–49].

New technologies and techniques, such as photogrammetry [50] and laser scanning [51], allow for more accurate digital capture of 3-dimensional objects and surfaces. Early efforts included modelling and rendering of artefacts and architecture from photographs (e.g. [52]). Current applications employ advanced non-contact close or long range scanning, modelling, analysis and computer-based visualisation tools to produce: three-dimensional (3D) recordings of archaeological sites and buildings (e.g. [53]) and of small objects (e.g. [54]) and three-dimensional visualisations of cultural heritage sites, using airborne scanning and imaging [55] or from geospatial information [56].

Digitisation technologies are already in use in the field of heritage (e.g. in museums or monuments). Limited research and solutions can be found regarding the interaction between cultural heritage, scan/photo and immersive technologies, potential customers and visitors' experiences in the cultural tourism locations, events and attractions. The use of advanced 2D/3D digital scanning of small and large-scale objects and surroundings and the valorisation of the digital spatial models produced has the potential to create unique, immersive cultural experiences, using affordable consumer electronics.

4.2 Front-end delivery

4.2.1 Communication of cultural heritage and cultural tourism

The introduction of technologies for cultural heritage communication has revolutionised the concept of "museum experience" and "historic site experience", leading to the emergence of novel services powered by the **digitisation of cultural heritage artefacts**. In recent decades many GLAM organisations (i.e. Galleries, Libraries, Archives, and Museums) and historic sites have launched initiatives to improve representation, engage visitors with content in new, innovative ways and support cultural revitalisation. Technology is increasingly used to support novel forms of narration and improve the **historic interpretation** of cultural heritage, i.e. the ways visitors make meanings and connections to the past, in order to experience culture [57, 58]. Digital technologies have the power to transform history and cultural heritage into a living resource, also in the form of embodied Interactions [59]. Complex interconnected cyber-physical systems for experiencing cultural heritage can thus emerge [60].

4.2.2 Hybrid onsite experiences

Digital technologies have the potential to redefine the way visitors experience and connect with museums and cultural sites, as well as expand the on-site visit with prior and post experiences [61]. Most heritage sites are multidimensional and dense with meaning. Different cultural heritage contexts can coexist and serve as a backdrop for many overlapping services and experiences, suitable for diverse audiences. As the motivations, interests and degree of engagement of audiences vary, creating relevant cultural heritage experiences that engage and resonate with each visitor represents a challenge for the sector. The early "electronic" tour guide model was based on predefined itineraries, complemented by the synchronised delivery of textual and/or multimedia content that was curated by museum experts.

The evolution of Ubiquitous Computing technologies enabled the introduction of context-aware and location-aware features that offer the user increased degrees of freedom (e.g. through the combined use of mobile phones and RFID technologies). Traditional linear narratives (e.g. in the form of typical guided tours) are thus replaced by **visitor-directed narratives**, in which the visitor is in control of the content they consume [62]. The former involved mainly applications that mimic the purposes and experience of a **traditional guided tour** (e.g. mobile tour guides and museum websites), while the latter is facilitated by technologies that help create interactive and immersive experiences [63, 64]. The challenge is to not merely communicate scientific information, but to develop audience-centric experiences that achieve a **narrative and emotional engagement** of the audience [65, 66]. Better cultural accessibility and inclusion has the potential to enhance citizens' **well-being** [67].

Digital storytelling represents an effective way to deliver content in cultural heritage [68], achieve emotional resonance and create human connection. Immersive experiences can put the visitor in control of the content and make them feel as if they are a part of the exhibit or program [63, 64]. The combination of advanced immersive technologies with storytelling techniques, can help create **emotive digital experiences** that bring cultural heritage sites and events alive [69].

For example, the GIFT project developed a portfolio of free, open-source tools and methods that museums can use to enrich the physical experiences of their visitors, such as a Mobile Game to encourage collaborative storytelling within the museum [70]. The EMOTIVE project developed immersive storylines using a range of technologies including virtual and augmented reality and mobile phone apps, to create more 'emotive' cultural site visits [69].

Audio augmented environments, featuring concepts like sonic narratives, soundscapes and binaural spatialisation have also been explored in the cultural heritage context [71].

Digital technologies can help enrich a physical visit to a cultural site or a museum, with rich complementary content tailored to the needs of the visitor. Heritage sites can be enriched by scanning and overlaying virtual annotations on top of these places. Devices can be directed at the point of interest, and 2D/3D e.g. texts, sounds, icons, videos are added to the users' view. These applications provide visitors with immediate cultural location-based information regarding specific points of interest [72], they allow them to explore personal cultural locations and points of interest [73] and give them opportunities to discover new or unknown knowledge [74]. Every cultural site has a specific "wow-factor" that has to be captured and transported via digital technology and digital communication channels. From the provider view, new business models and opportunities can be identified and initiated using novel digitisation technologies [75], which can help increase the competitiveness of the cultural site [76] with significant spillover effects on the local economy. Recent research efforts go beyond visual, sound, or narrative enhancements, to provide visitors with multisensory stimulations [77].

For people with **disabilities**, digital innovations, such as sign language video avatars, tactile artwork reliefs, barrier-free apps for museum visits, etc., can help them overcome access barriers to cultural spaces [78].

4.2.3 Online experiences—virtual museums

The online presence of museums is changing, with traditional museum websites evolving into **online "walk-through" museums,** featuring dynamic exhibitions and versatile multimedia explorations of cultural heritage [79]. Advances in digitisation technologies provide the means for new forms of engagement with

museum-held heritage via 3D multimedia-rich museum websites, online "walk-through" museum explorations [80], virtual museum exhibitions [81], virtual environment system installed within a real museum [82], online community platforms [83, 84], etc. This has also led to novel context-aware representations of cultural heritage, produced from merging 3D models of artefacts, like in the case of the MUVI - Virtual Museum of Daily Life [85].

Ambient intelligence technologies (AmI) provide the means for personalizing content and user interfaces (UIs) to each individual user [86].

Virtual museums have also emerged. The term **virtual museum** describes "a collection of digitally recorded images, sound files, text documents, and other data of historical, scientific, or cultural interest that are accessed through electronic media" [87]. Unlike a traditional museum, a virtual museum does not house actual objects. Instead, it channels digitised representations of artefacts from one or several cultural institutions (e.g. Google Cultural Institute). A virtual museum can also be set up, in order to provide access to cultural sites that are otherwise invisible to the general public and to cultural artefacts that no longer exist or are impossible to view physically [88–94].

For example, the "Underwater Malta", virtual museum for submerged cultural heritage, provides access to numerous inaccessible underwater archaeological sites [95]. This is facilitated by recent advances in underwater imaging and processing software and the development of 3D photogrammetry of submerged sites. The GRAVITATE project developed software tools to allow archaeologists and curators to reconstruct shattered or broken cultural objects and to identify and re-unify parts of a cultural object that has been separated across collections [96]. Similarly, the Time Machine project [25] combines digitised archives from museums and libraries, with Artificial Intelligence and Big Data mining, to offer richer interpretations of our past. The project developed a 4D (3D plus time) engine which 'recreates' past cities, as digital twins of our cities ('Mirror Worlds') that is accessible from mobile phones or through specific Augmented Reality interfaces. 3D models can "**time-travel**" users to historical places, cities or buildings in a specific historic period to deliver a feeling of how daily life was [97, 98]. While in the past, 3D visualisation content was merely used to digitally visualise historic artefacts (e.g. replace damaged or missing physical artefacts), presently realistic **virtual heritage environments** can be developed to contain 3D models of heritage object, thus visualising three-dimensional contexts as well, in order to offer a much richer user experience. For example, the INCEPTION project revolved around the development of heritage"spaces"(complex architectures and sites) and semantic enrichment for creating 3d Models to cater for multiple purposes, in line with the specific needs and level of knowledge of the end-users [99].

In the last two years the Covid-19 pandemic, which disrupted the daily routine of museums and brought the global tourism industry to a standstill prompted the adoption of innovative approaches building on digital instruments, such as **virtual tours** [100, 101] that build on geo-referenced sequences of panoramic images and three-dimensional models of the actual site [102]. According to Nemtinov et al. [103] "Virtual trips to memorable places allow experiencing history in an interactive form; they attract the audience and promote interest in museums and, accordingly, strengthen their cultural and educational functions".

4.2.4 Onlife cultural experiences

Advances in digital technologies are helping connect a person's cultural heritage experiences to their "daily" life, i.e. they provide the means to enhance other experiences outside the museum site, based on experiences at the museum site [61].

Overall, immersive experiences for cultural heritage can take shape in a variety of forms, including the use of augmented reality, virtual reality, serious games and gamification, embodied interaction etc. Central ls the role of Virtual Reality and Augmented Reality which allow for new ways of experiencing cultural heritage. Augmented reality can overlay additional information onto existing artefacts, while virtual reality facilitates fully immersive virtual explorations [104]. Virtual Reality head-mounted displays (HMD) provide a first-person stereoscopic view of the environment and the ability to physically change the looking direction with head rotations. Mixed reality and semi-immersive VR applications combine the real and virtual environments [26]. Audio augmented environments, featuring concepts like sonic narratives, soundscapes and binaural spatialisation are also being explored in the cultural heritage context [71].

4.2.5 Mobile applications

Central to this shift is the rise of mobile communications and the rapid uptake of smartphone technology. Users today are increasingly connected to the world of digital information while "on the go" via mobile devices. GSMA [105] estimates that the number of unique mobile subscribers will reach 5.8 billion by 2025, equivalent to 70% of the world's population. The European Travel Commission (ETC) stressing that ownership of mobile devices and mobile online access is high and increasing, reached the conclusion that in the future those travelling within and to Europe will be smartphone-equipped and will have both the technological capability and the online access to engage with online content that will make their travel and experiences richer and smoother. Smartphones, tablets and other mobile and handheld technologies are increasingly playing a central role in touristic experience mediation [106] and as a travel tool during all stages of tourism consumption [84]. Wang et al. [106] noted that "the instant information support of smartphones enables tourists to more effectively solve problems, share experiences, and "store"memories". Dickinson et al. [84] concluded that smartphones are enhancing temporal and spatial awareness, i.e. are evolving society's contemporary understandings of time and relationships with place and things in significant ways for travel by (a) enhancing the temporal alignment between people, the things they need, destinations and attractions, and activity options and (b) providing tourists with enhanced spatial tools and awareness (place-related information and content), ultimately leading to knowledge-rich visitors.

5. Conclusions and way forward

The present chapter discussed the emerging paradigm of cultural heritage experience, as shaped by the continuous advances in information technologies. Cultural heritage experiences can benefit greatly from the current trend towards digitalisation, systematisation and accessibility of digital cultural resources. Advancements in technology are creating new opportunities to digitise cultural heritage for preservation, conservation, restoration, research, as well as for broader online access and re-use by citizens and various sectors, such as tourism. The amount of digitised cultural material is growing very rapidly, also thanks to numerous initiatives for the digitisation of cultural heritage content belonging to museums, libraries, archives etc. The experience of cultural heritage is constantly evolving and is expected to continue to develop in complexity and sophistication, as new opportunities for the technological representation and communication of culture emerge and the types of transaction and encounter with tangible and intangible cultural heritage increase.

The experience of cultural heritage will continue to develop in complexity [9]. The shift towards more sophisticated technology-enhanced cultural heritage experiences is facilitated by the growing digitisation of cultural heritage, continuous innovations in 2D/3D digital scanning, in image enhancement and 3D reproduction, and in immersion technologies, the emergence of advanced equipment (such as head-mounted displays (HMD), the affordances of ubiquitous computing and mobile applications and novel easy-to-use authoring tools. Advanced digitisation, and digital preservation and accessibility have been instrumental in transforming people's experience of cultural heritage assets, relics, and monuments, as well as of intangible heritage. The ViMM project concluded that harnessing additional technologies will have increasing relevance for museums and cultural heritage institutions, including: artificial intelligence; computer vision; deep learning/machine learning; and adaptive cognitive methods [107].

Given the strong economic spill over effect of cultural heritage, interest in advancing the communication of cultural heritage goes beyond the traditional players of the sector: GLAM organisations (i.e. Galleries, Libraries, Archives, and Museums), cultural and historic sites etc.

Regions and local communities increasingly pursue the valorisation of their local heritage, leveraging what makes their societies unique, to promote their cultural identity and boost economic growth. Communicating cultural heritage to visitors in understandable and engaging ways is challenging, yet it represents an increasingly important aspect of tourism destination marketing. Presently, the relationship between tourism and culture is transformed by the affordances of new technologies. Advanced digital technologies can accommodate the provision of value-added learning experiences to visitors to increase the attractiveness of heritage sites.

Developing cultural heritage experiences is a **complex socio-technical, multi-disciplinary exercise** that spans several distinct areas: **Back-office** capabilities, in terms of accessible, quality digital cultural content, need to be in place, to subsequently be able to **design, develop and provide** cultural heritage experiences, and to **align** these with the requirements and expectations of the intended users.

Required technical capabilities thus range from back-office infrastructures for digitisation, standardisation, storage and retrieval, computing, connectivity, instrumentation and online accessibility of cultural materia, to authoring, service development and collaboration tools, to digital solutions for the technology-enabled experiencing of cultural events, arts and heritage and the creation of new applications on new devices, for different audiences and for different purposes.

Offerings should be expert-driven and **user-oriented** at the same time. Meeting the need for customised cultural heritage communication offerings implies continuously developing cultural heritage experience services and new processes of value creation. This implies a need for rapid development, and continuous adaptation and enrichment of the offerings. On the backend side, this translates into tailored content creation and easy content reuse, re-purposing and improvement, which in turn call for access to sources of relevant digital content (Cultural Heritage repositories) and domain expertise, besides technical skills and authoring environment capabilities. As value shifts to visitor experiences, cultural heritage experience development essentially should be regarded as a **co-creation** exercise, in which cultural heritage experience services are shaped and continuously adapted through the interactions between consumers and service providers [108].

Of particular importance is to increase awareness and acceptance of the "Digital Turn" within the cultural heritage community. Increasingly cultural institutions will have to incorporate technology solutions within their day-to-day responsibilities. Skills requirements and organisational aspects also need to be considered.

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Chapter 15

SYNTHESIS: A Platform of Platforms for Integrated Management, Curation, and Visualization of Digital Cultural Experiences through VR and AR Technologies

Stelios C.A. Thomopoulos

Abstract

SYNTHESIS is a platform of platforms (PoP) for the management, curation, and creation of digital cultural experiences related to cultural heritage material (artifacts), and their visualization through mobile applications and virtual and augmented reality (VR/AR) technologies. The digital cultural experiences may relate to specific cultural heritage monuments or exhibits of museum collections and may reside either on site or remotely. The platform provides a comprehensive supervisory tool that allows curators to select digital artifacts from different databases around the topic of interest, associate them through narratives that translate them into a sequence of semantic correlations that can be visualized using VR/AR technologies. The SYNTHESIS of platforms contributes to the creation of a new condition for the promotion of cultural heritage sites, museums, and exhibits, and facilitates the management and interaction of the user-visitor with them. The platform contributes to the creation of an innovative system for the management and curation of large volume of digital material related to an exhibit and consequently its promotion by unifying the stages of: (a) production of digital content; (b) connection of additional digital multimedia material related to the digital content; (c) curation of the digital content and transformation to a digital experience in accordance to a desired narrative; and (d) visualization of the digital experience in-situ or remotely with the use of mobile apps and VR/AR technologies.

Keywords: Narration, digital experience, curation, digital cultural artifacts, visualization, virtual reality, augmented reality, mobile apps, VR/AR technologies, digital tourism

1. Introduction

The SYNTHESIS PoP has emerged from the aggregation of three digital platforms that have been developed at the Integrated Systems Laboratory (ISL) over a period of seven years in the context of DICE (Digital Immersive Cultural

Environments), a concept and architecture of a comprehensive ecosystem for the promotion of digital cultural experiences introduced by the author in 2014 and detailed in his publication, alongside with his research team at the Media Art Innovation (MAI) Unit of ISL, in 2016 [1]. The three building blocks of SYNTHESIS, namely the platforms SYNTELESIS/iGuide, AFIGISSI (Narration), and wayGoo, have been described as stand-alone platforms in the references [2–9] (in Greek), and in [10–12].

SYNTHESIS PoP aspires to create a unified digital environment for the coherent creation, management, editing, and visualization of digital material related to cultural heritage artifacts (monuments, museums, museum exhibits, art exhibitions), and the development of personalized interactive narrative experiences using mobile and VR/AR technologies for visitors to places of cultural interest.

The SYNTHESIS PoP aims to offer tools for managing a large volume of digital material, supporting various forms of digital content, such as text, images, video, audio, 3D objects, BIM objects, Unity scenes, etc., and covering a wide range of available material. These building blocks, combined with recorded stories and information, will be interconnected to compose digital exhibits that will be converted into digital experiences, either in-situ through mobile and AR technologies, or remotely through VR technologies.

SYNTHESIS will contribute to the creation of a new condition for the promotion of cultural heritage sites or museum exhibits and facilitate the management and interaction of the user/visitor with them, and the overall user experience. The PoP will results in an innovative environment for the integrated management of a large volume of digital material, the creation of narrative experiences related to digital exhibits for visualization in physical and virtual spaces, and consequently the promotion of cultural heritage by supporting: (a) the production of digital content; (b) the linking of digital content to additional multimedia digital material related to said content, such as relevant data relating to the process used for creating digital content, relevant digital and digitized audiovisual material, recorded stories and information relevant to the context of the subject matter and narrative used as the basis of creation; (c) the designing and curating a narrative flow for a deeper understanding of the content associated with the subject of an exhibition of digital material, both virtual reality and physical space, by visitors and end users; and (d) the transformation of the curation outcome into experiences for in-situ and/or distance visualization capable of mobilizing both tourist and social interest in the importance of the cultural heritage as a holistic educational-educational experience and the need for its preservation and promotion, **Figure 1**.

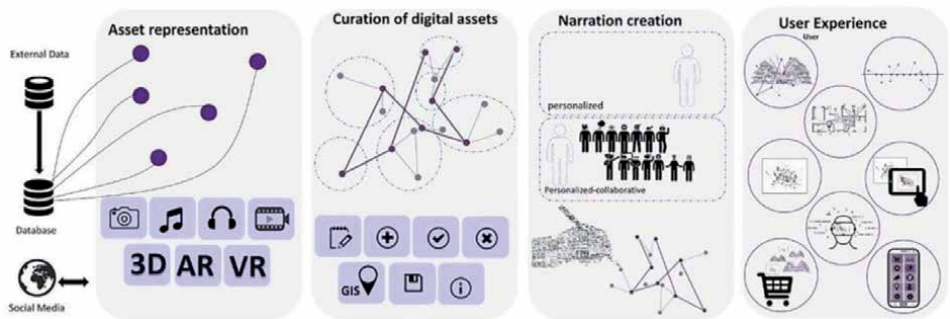

Figure 1.
Curation of digital objects, creation of digital experiences through narration, and visualization with virtual and augmented reality technologies and mobile apps [1, 2, 4].

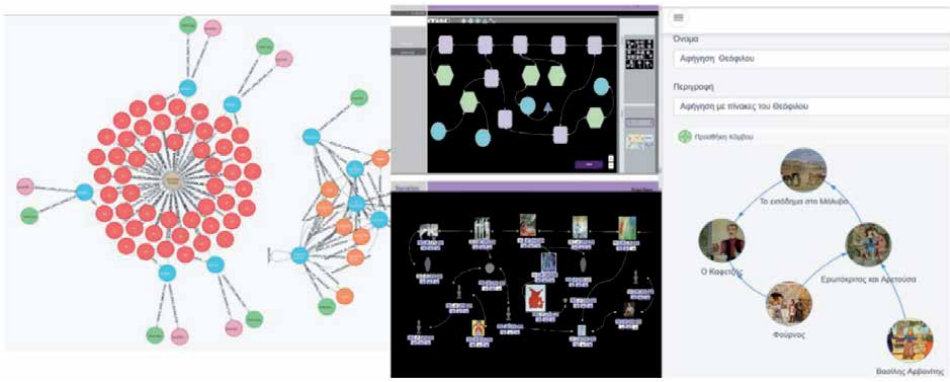

Figure 2.
Using graphs and graph databases for seamless digital content interconnection and digital narrative creation.

In the context of a digital experience (be it at a natural exhibition or museum, an archeological space, a virtual space, or a hybrid environment), it is possible to connect the digital exhibits semantically and thematically digital exhibits to a physical or virtual exhibition, museum, or archeological site, through the use of graphs and graph databases (**Figure 2**). In this process, the content reporting platform wayGoo [10] is used to visualize the georeferenced narrative in an easily to understand way in a physical, virtual, or hybrid reality space.

The easy understanding of the content by the end user in the context of a narrative is achieved through the transformation of the narrative into an immersive interactive experience capable of being consumed by common mobile tablets and smartphones using AR technologies in the exhibition/museum space/archeological site, **Figure 3a**, as well as through more integrated solutions such as VR headsets and/or projection imaging technologies for remote experiences in virtual space, **Figure 3b**. A narrative can be created by artists and people in the field of culture, using an accessible and friendly graphic environment. Storytellers will not be required to possess advanced and specialized knowledge of the underlying technologies used to implement it.

SYNTHESIS is accompanied by two applications available for use by the public (**Figure 4**).

Figure 3.
(a) In-situ experience through AR. (b) Remote experience through VR technologies.

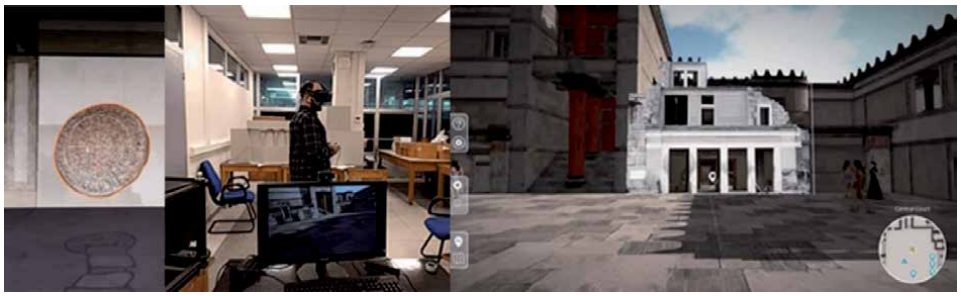

Figure 4.
VR/AR applications of the SYNTHESIS PoP to be used by the general public for immersion experiences.

1. An augmented reality application for mobile devices that offers possibilities of interactive exploration of an exhibition and consumption of all available digital material associated with it as an immersive storytelling experience during the physical presence of the user in situ.

2. A virtual reality application that allows the interactive exploration of an exhibit remotely and the consumption of rich 3-dimensional models and interactive scenarios with realistic graphics directly from a VR-enabled device.

The SYNTHESIS PoP also offers advanced tools based on artificial intelligence (AI) and natural language processing (NLP) techniques to assist the discovery of contextual correlations between digital content, digitized assets, and digital

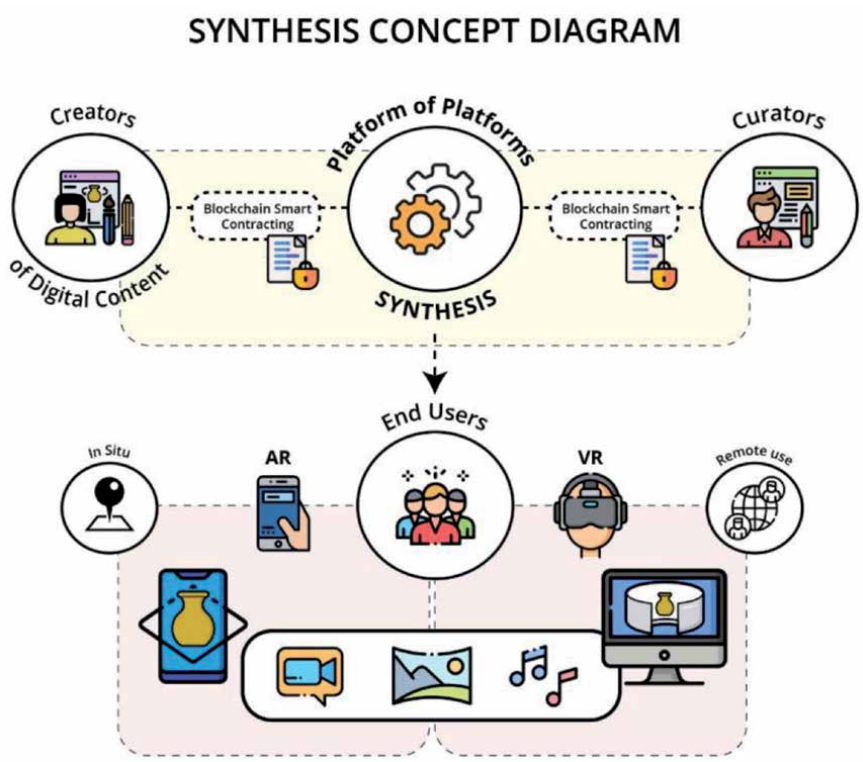

Figure 5.
Schematic representation of the SYNTHESIS of platforms with blockchain functionality.

artifacts and exhibits [13, 14]. By analyzing the structural elements of the exhibits alongside with all known connections among them, the system identifies possible undiscovered correlations and provides a multimodal and user-friendly representation and visualization of the results. AI and NLP tool and technologies are also used to implement a system of personalization and personalization of the experience in accordance to the user preferences. The personalization system recommends relevant exhibits and narratives based on user interests, in order to maximize the in-depth understanding of the content of the narrative associated with the curated experience in accordance with the curation and visualization approach of the digital content curator.

Finally, using blockchain technology, it is possible to implement smart contracts to control the use of digital content by its creator, and to track the ways of its utilization. This will safeguard the integrity of the digital content and protect the copyright and financial rights of its creator, **Figure 5**.

In summary, the main goal of the SYNTHESIS PoP is to contribute to the promotion of cultural heritage items and places of cultural interest to a global audience by visualizing the results of recording and research with VR/AR technologies and the possibility of interactive and personalized experience of the relevant content. situ and/or remotely. It also aims to highlight the work of artists and people in the field of Culture, and to promote culture to the public through tools to create innovative and engaging experiential experiences using cutting-edge technologies. It will offer visualization of an exhibition through personalized interactive narrative experiences of virtual and augmented reality (VR/AR) and the georeferencing of its individual exhibits in places of cultural interest (art exhibitions, museums), allowing the creation of educational and educational experiences, the mobilization of tourism and social interest, and the preservation, promotion, and curation of its exhibits. In **Figure 6**, we give an example of using the wayGoo platform [9] to visualize an

Figure 6.
Example of using the wayGoo platform to visualize an interactive experience at the palace of Phaistos in Crete, Greece.

interactive experience of digital representations of cultural treasures from the Minoan palace of Phaistos in Crete created with the help of the SYNTELESIS platform by the Integrated Systems Laboratory with the use of digital immersion technologies, such as content geo-reporting (wayGoo), AR/VR, and 2D/3D animation.

Additional objectives of the SYNTHESIS PoP include:

1. The further promotion and editing of cultural heritage items through the visualization of the results of recording and research and the creation of complex digital objects.

2. The promotion of the work of artists and people in the field of Culture, and the promotion of areas of cultural interest, and the promotion of culture at large to the public, through the provision of tools for creating innovative and attractive mixed-reality experiences using cutting-edge technologies.

3. The transfer of know-how on and the experience from research and development of state-of-the-art products from research centers and professional researchers to start-ups through dissemination of knowledge and networking, to assist them generate profit, develop human resource skills, and attract new and supporting extroversion and competitiveness.

4. The creation of new jobs in the creative industry and the provision of intellectual property and rights, including financial, for creators through smart contracts and integration of blockchain technology in the SYNTHESIS PoP ecosystem [1].

The SYNTHESIS PoP seeks to strengthen the activity in the field of Culture, Tourism and Creative (CTC) Industries, in terms of the production of digital content (entertainment, educational, cultural, commercial or other interest), and the organization of big scale activities and events. The PoP and user applications are expected to be marketed either as separate products or as a single system. The architecture and modular system of the platform, as described by its main components (wayGoo, NARRATION, iGuide VR/AR component), allows future adaptation to content and requirements of different organizations. The modularity of the SYNTHESIS PoP allows to accommodate different markets and different players in the CTC Industries in the SYNTHESIS ecosystem in a way that is expected to lead to maximizing market penetration and benefits for the constituencies of the ecosystem by enabling the efficient management of digital content, the facilitation of the conversion of digital content into experiences, and the protection of IPRs and profit flows through blockchain and smart contracts.

2. SYNTHESIS and the DICE[1] ecosystem

The adoption of the SYNTHESIS PoP is expected to lead to the following benefits in each one of the five (A, B, C D, and E) sectors of the DICE Ecosystem, **Figure 7**.

A. For businesses

- Facility of specialized users in the design and editing of large-scale interactive experiences, through a narration tool that allow easy and creative workflow.

[1] DICE: Digital Immersive Cultural Environment [1]

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- Creation of a perfect product, developing with scientific methodology and dynamic commercial presence.

- Strengthening the technological base, gaining a technological lead in the field of production and supervision of interactive producers, which sets the specifications for the expansion of the developing platform.

- Enhancing innovation and competitiveness in the field of artistic curation. Internationally, there is no system that provides a complete solution for large-scale interactive events.

- Opening to new national and international markets. Penetration in the market through the possibility of highlighting and reusing places of cultural interest: Museums, Art Galleries, Archeological sites, preserved Industrial sites etc.

B. For cultural institutions

- Strengthening cultural tourism by increasing the tourists' interest in visiting cultural sites as a result of upgrading their on-site experience, but also through a strategy of diffusion of the results of the implemented activities.

- Strengthening the networking of cultural organizations through the creation of business networks with the cultural and creative industry for the joint promotion of the innovative products of the project.

C. For the Creative Industry

- Improving the productive potential of digital technology and digital content companies.

- Approach of new markets in the field of culture and tourism, inaccessible until today, through their activity in designing interactive audiovisual content.

D. For research centers

- Utilization of research for the development of market-oriented solutions, through the conversion of the research product into a commercial product. Added value that results through innovative interventions and interdisciplinary cooperation, in order to create a final product that promotes Greek tourism and culture.

- Distribution of research results to the general public, through the commercial product but also through presentations at conferences.

E. For the Economy and Society

- Improvement of the user experience and enrichment of the means of receiving the artistic/creative result, through his active participation in the interaction in natural and virtual space.

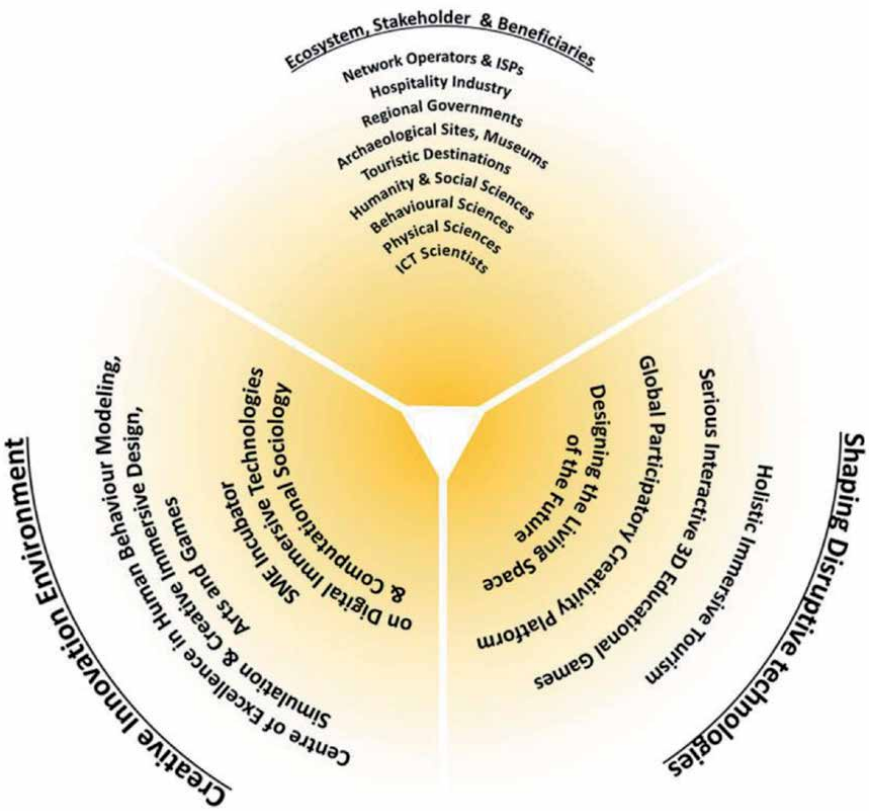

Figure 7.
The digital immersive cultural environment (DICE) ecosystem [1].

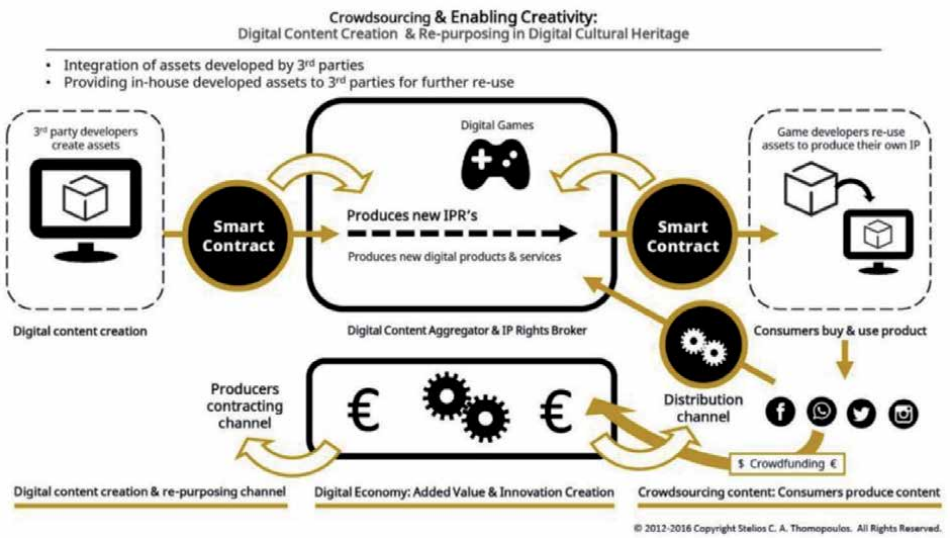

Figure 8.
Enabling digital creativity ecosystem for the creation of digital immersive cultural environments (DICE) [1].

- Promoting cultural spaces through the implementation of technologically and artistically perfect cultural events and enhancing the interest of the general public for them.

- Promoting the collaboration of artists with audiovisual events.

The SYNTHESIS PoP is expected to act as a catalyst in the articulation of a digital creativity ecosystem for enabling the creation of DICE (Digital Immersive Cultural Environment) [1], **Figure 7**. The incorporation of smart contracts and blockchain technology in SYNTHESIS is expected to stimulate the process of crowdsourcing digital artifacts, narratives, and experiences alongside with their visualization, from professionals, as well as qualified non-professionals, in the fields of art, culture and creativity. The embedded protection of the Intellectual Property Rights (IPRs) of the digital creator build in SYNTHESIS, and the use of blockchain-enabled Smart Contracts to speed up the contracting and outsourcing process, track revenue streams form the use or sales of digital content, and protect the agreed upon revenue sharing with the creators of the digital content, narrative and experience, are expected to spearhead the process of digital creativity across the entire digital creativity ecosystem as shown in **Figure 8**.

3. Methodology of flexible design and development of technological solutions

The SYNTHESIS PoP aims to create a coherent platform for the creation of advanced digital assets, the curation of digital objects and their semantic and thematic interconnection through the creation of narratives, and the creation of digital experiences in virtual and real space through the georeferencing of edited digital content and related storytelling, with a range of virtual and augmented reality technologies using tablets, smartphones, virtual reality glasses, and projection imaging technologies.

The SYNTHESIS PoP is based on the coherent integration of existing platforms, services, algorithms, and applications that have been developed in the Integrated Systems Laboratory (ISL) and their effectiveness has successfully been evaluated. The timely and effective accomplishment of SYNTHESIS objectives is largely ensured through the validation of the existing know-how and the possibilities of adopting it in developing solutions for other use cases, similar ot completely new. Technological solutions already developed will be adapted to new requirements and tools already available will be leveraged, adapted as required, and integrated in a coherent SYNTHESIS PoP.

The three platforms SYNTHESIS PoP is made up of, namely wayGoo, SYNTELESIS and AFIGISSI (Narration), are briefly describe in the following. All three platforms have been developed in the Integrated Information Systems (ISL) Laboratory of the Institute of Informatics & Telecommunications at NCSR "Demokritos" through a series of funded projects that are described in the publications [1–10] and acknowledged at the end of the Chapter. The three platforms are:

a. **wayGoo** - wayGoo is a platform for Geolocating and Managing indoor and outdoor spaces and content with multidimensional indoor and outdoor Navigation and Guidance. Its main components are a Geographic Information System, a back-end server, front-end applications and a web-based Content Management System (CMS). It constitutes a fully integrated 2D/3D space and content management system that creates a repository that consists of a database, content components and administrative data. wayGoo can connect to any third party database and event management data-source. The platform is secure as the data is only available through a Restful web service using

https security protocol in conjunction with an API key used for authentication. To enhance users experience, wayGoo makes the content available by extracting components out of the repository and constructing targeted applications. The wayGoo platform supports geo-referencing of indoor and outdoor information and use of metadata. It also allows the use of existing information such as maps and databases. The platform enables planning through integration of content that is connected either spatially, temporally or contextually, and provides immediate access to all spatial data through interfaces and interactive 2D and 3D representations. wayGoo constitutes a mean to document and preserve assets through computerized techniques and provides a system that enhances the protection of your space, people and guests when combined with wayGoo notification and alert system. It constitutes a strong marketing tool providing staff and visitors with an immersive tool for navigation in indoor spaces and allowing users to organize their agenda and to discover events through the wayGoo event scheduler and recommendation system [10]. Furthermore, the wayGoo platform can be used in Security applications and event management, e.g., CBRNE and fire incidents, man-made and natural disasters, pandemics, etc., to document and geolocate information and sensor data (offline and real time) on one end, and offer navigation capabilities in indoor and outdoor spaces. Furthermore, the wayGoo platform can be used for the creation of immersive environments and experiences in conjunction with VR/AR (Virtual & Augmented Reality) technologies [9, 10].

b. **SYNTELESIS** – A platform designed to provide a combined web application with a mobile application and a unity desktop application to support immersive digital experiences with digital cultural assets in cultural heritage sites or in virtual counterparts. The platform features an extended exhibit object model, geo-referencing of places and exhibits with for digital physical support, and a variety of mobile and AR capabilities to support an immersive experience in-situ or remotely. A case study of an immersive digital experience of the archeological site of Phaistos, Crete, has been designed and implemented with the use of SYNTELESIS [1, 2, 7].

c. **AFIGISSI** (**NARRATION**): An integrated system for the management and editing of digital content and the production of personalized individual and collaborative narratives considers the objectives of the Faro Convention [15]. AFIGISSI aims at the development of a platform for the support, management, and promotion of digital content for infrastructures of cultural and tourist interest through the creation of personalized individual and collaborative narratives [7]. Digital collections offer the opportunity to examine objects not only as individual cultural elements but as an integral part of the cultural heritage as defined by the European Union [16].

Access to the narratives is possible either during the physical visit to the infrastructure during their regular operation and in extraordinary, periodic or temporary events or remotely. Traditional narrative practices address the development of narrative by placing objects on a linear axis. Instead, the work highlights cultural content with new narrative structures, operating with less strictly prescribed scenarios. In fact, according to new media theorist L. Manovich [17], the database is generally the way to tell a story today. The creation of narratives is achieved in an automated and semi-automated way, by reversing the time axes

Figure 9.
Schematic representation of the main structural elements of the SYNTHESIS platform.

and with a variety of thematic grouping options, making a theoretically infinite number of combinations [18], in order to respond to modern perceptions of object multiplicity and the possibility of multiple interpretations. Personalization is done both for individual users and for groups of users who work together to create a narrative. According to the current level of collaborative platform technologies, there are possibilities to connect multiple users for the purpose of a common task [19]. The system allows specialized and non-specialized users to produce stories of various sizes based on the content available and share them with the public. The aim is a holistic approach to storytelling that will lead to mature technology and an innovative tool aimed at the market for (a) the design and implementation of digital collection management software platforms for cultural operators, and (b) web applications, mobile and VR/AR applications for organizations of digital exhibitions and creation of narratives from a registered collection of museums and other cultural exhibits.

In the SYNTHESIS PoP, the three building-block platforms are redesigned, expanded, and integrated into a single controllable and coherent digital creativity environment with the addition of blockchain technology for the protection of IPRs and the introduction of smart contracts for the facilitation of signing contracts for the creation of digital assets, content, context, and experiences, and the verifiable of equitable sharing of revenue streams across the entire creativity chain involved in the creation and visualization of digital experiences, **Figure 9**.

4. SYNTHESIS PoP architecture

Figure 8 depicts the Implementation Architecture of the SYNTHESIS PoP. In the architecture, there are three distinct layers: The Data layer, the Business Logic layer, and the Presentation layer. Each layer is made up of various components as indicated in the infographic of **Figure 10**.

1. The **Data layer** supports:

   i. (interfaces with) third party databases;

   ii. innate to SYNTHESIS databases, such as mongoDB, Neo4j, PostgreSQL, ...;

   iii. a repository of digital assets; and

   iv. a blockchain module for the protection of IPRs and the support of Smart Contracts.

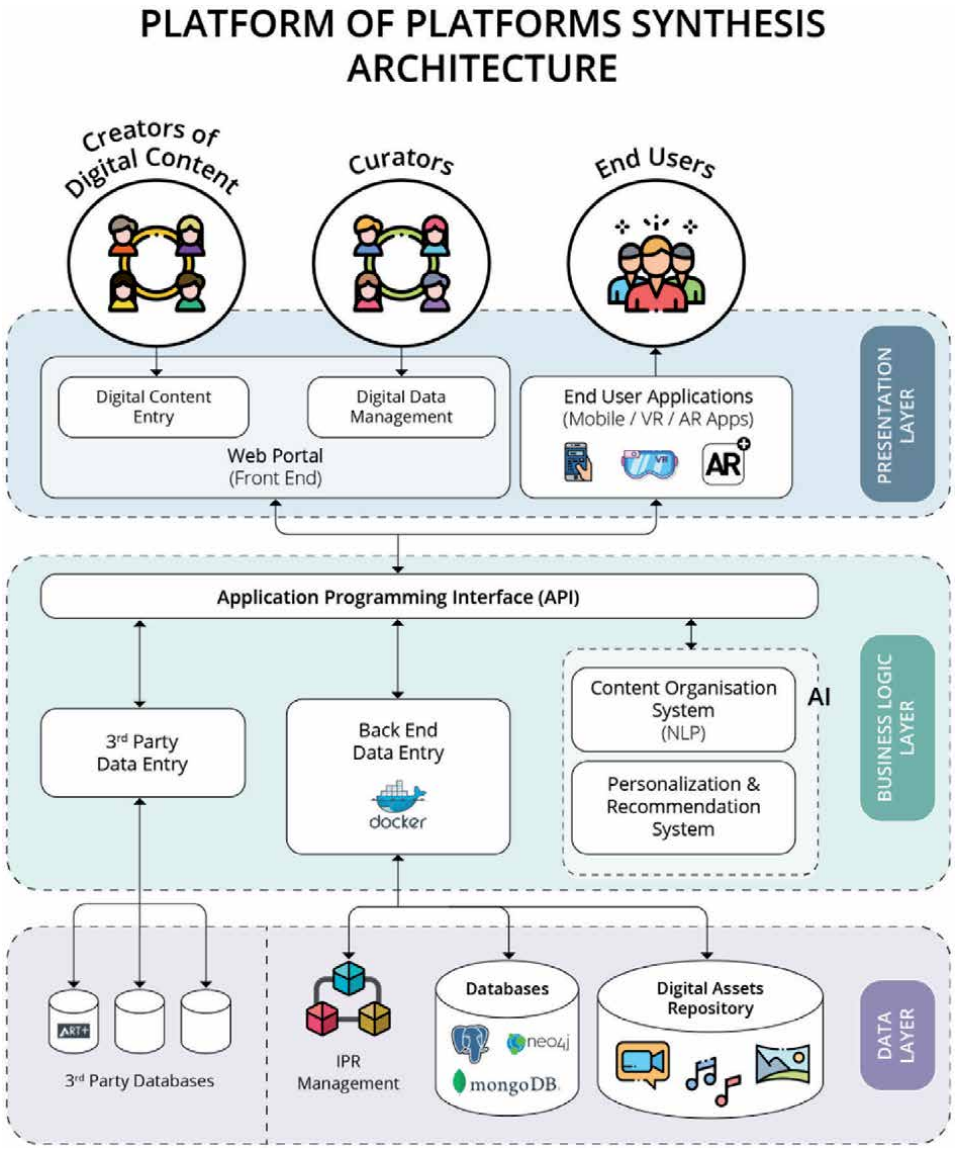

Figure 10.
Implementation architecture of the SYNTHESIS platform of platforms.

2. The **Business Logic layer** supports:

   i. an Application Programming Interface (API) that allows users and end users of the PoP to interface with SYNTHESIS through either

      a. the Web Portal for the production, curation, management of digital content and the creation of experiences, or

      b. the Visualization Applications (mobile and VR/AR);

   iii. A Back-end Support System (docker) for dockerizing content;

   iv. an AI (Artificial Intelligence) component that consists of two modules:

a. a Content Management System based on Natural Language Processing (NLP) to support contextual and semantic correlations and AI algorithms and applications, and

b. a Personalization and Recommendation system alongside a variety of statistical, fuzzy and AI based processing algorithms, to support user-tailored digital experiences of the curated digital material and narratives.

3. The **Presentation layer** supports:

i. a User Interface (UI) in the form of a Web Portal that allows to:

a. Insert Digital Content in SYNTHESIS, and

b. Manage Digital Content in PoP;

ii. User Experience (UX) through End User Applications that include:

a. mobile apps for both Android and iOS smartphones, and

b. VR/AR technologies for a variety of portable platforms and devices.

Moreover, the SYNTHESIS PoP architecture and the accompanying applications support the following:

- Enrichment of support and management of geo-reported data related to natural areas, together with services for the consumption of this information with GIS/Tile services.

- Improving the determination of geographical location indoors to facilitate indoor navigation with the use of existing know-how from the implementation of a Bluetooth Beacons infrastructure developed in the context of the European funded projects FlySEC, http://fly-sec.eu/ [20] and TRESSPASS https://www.tresspass.eu/The-project [21].

- End users can consume the digital content of the platform through a mobile application. The application can be used: (a) either during the physical presence of the user in an exhibition, where is guided in the tour of the exhibition, taking into account user priorities, or (b) remotely, where the user is guided to explore the exhibition and delve into the digital content that the platform provides. Using GPS technologies and/or Bluetooth beacons, the application can locate the user physical location, suggest relevant exhibits and narratives, and assist in exploring and navigating the area. Users can locate exhibits and places of interest through an interactive map, from a list through a narrative, by scanning their own QR code, or through a search with free text which is interpreted lexically and semantically by the back-end AI module. Information about the exhibit is then presented, accompanied by its correlations with other exhibits, narratives, dates, and natural sites. Finally, it is possible to view 2D/3D models directly from the device, as well as play accompanying multimedia material in the form of images, videos, panoramic images, and sounds [7–9].

- Improving the process of creating narratives and their representation using graphs, as well as the general management of digital content and repositories [2, 4, 5].

- Design and development of Blockchain infrastructure for the use of smart contracts. To preserve the integrity of each element and to track the ways of its utilization, SYNTHESIS utilizes blockchain technology. This technology forms the basis for creating an unchanging event log. This file through the security properties of Blockchain will provide a high degree of protection of data integrity as well as their continuous availability. Within the SYNTHESIS PoP, the blockchain will record the interfaces between nodes of the graph as well as the changes in these interfaces. In addition, it will store metadata and metadata related to digital data as well as record which users of the "SYNTHESIS" platform utilize each component. Additionally, blockchain will record information about derivative projects that utilized a digital component as well as project location data in both physical and virtual exhibitions. The above functions make it possible to use the smart contracts executed on the blockchain. Smart contracts will allow creators to control which users (creators or curators) will be able to use the digital data they have created and for what purpose. Finally, smart contracts enable any interaction (e.g., data entry) with the blockchain.

- SYNTHESIS allows the establishment of correlations between different narrative elements (recommendation process) enriched with audiovisual material if required [13], and offers personalization services and personalized functions [10]. Based on the categorization of the narratives and the corresponding evaluations by the users of the application, machine learning and automatic classification techniques are applied to identify similarities between the narratives and their individual structural elements. These similarities are multi-layered, reflecting similarities that are based on the preferences of the users but also based on the content, and are determined conceptually and lexically, after processing natural language from any descriptions/tags/categories that accompany each narrative and each structural element. In addition, where possible, from each element, depending on its format (audio file, image, video, text), additional metadata/features are extracted using deep machine learning techniques. The additional metadata/features represent each object based on its components (e.g., color choices and image contrasts, rhythm/style of music, etc.). Through correlations with the respective user ratings, similarities are calculated in greater depth allowing the discovery of new correlations and features that determine user preferences. The result is a multidisciplinary graph that represents the narratives and objects, and the similarities between them at all the levels of similarity considered [11].

- With the aim of visualizing different types of experiences, the SYNTHESIS PoP supports the visualization of digital content of various types and formats (2D/3D) through a virtual reality application for mobile devices and VR headsets. Content can come from 3D modeling tools, e.g., Building Information Management (BIM) objects, or gaming machines, e.g., interactive experiences in 3D environments, (https://vimeo.com/isldemokritos). Each type of content offers different possibilities and therefore it is necessary to support all types of 3D content. The visualization of rich 3D experiences is realized with a user-centric approach [17–19] and through a (separate) application implemented in the Unity game machine and provides the possibilities of 3D visualization and navigation. The wayGoo application opens the Unity application and loads

DOI: http://dx.doi.org/10.5772/intechopen.98213

the corresponding experience by downloading the corresponding Unity asset bundle from the platform. Communication between the two applications can be implemented with mobile URL schemes that allow the use of parameters when opening applications [12].

5. SYNTHESIS PoP use in different use cases for pilot tests

The three platforms SYNTHESIS is based on, namely iGuide/SYNTELESIS, Narration/AFIGISSI, and wayGoo have been tested in different use cases, environments, and applications as pilot tests. Below we make reference to three such use-case scenarios by summarizing the use case environment, the scenario used and the targeted audience and objectives.

The developed solutions in the three use case pilot test scenarios aimed at analyzing the of SYNTHESIS and the three platforms within it, in terms of the efficiency and effectiveness of creating immersive experiences in the context of DICE. The three carefully selected use cases demonstrated the ability of SYNTHESIS, and the three platforms is made up of, to create:

a. **iGuide Knossos VR: An immersive 3D VR tour guide for the palace of Knossos** [22], a blueprint paradigm for touring and experiencing archeological sites that are partially or totally ruined, with the help of mobile and VR/AR technologies, either in situ or remotely [2–4], **Figure 11**.

In March 1900, on the Greek Island of Crete, Arthur John Evans, a British archeologist, unearthed what he called the Minoan Civilization; a colorful world that seemed forgotten by time. A blend between reality and imagination, the reconstruction of the Palace of Knossos has become an iconic symbol of the past, triggering endless debates and providing a rich canvas for creative reconstructions.

iGuide Knossos is a HD/3D VR reconstruction of the Knossos Palace that merges Evans' vision of the site with contemporary archeological evidence. It is

Figure 11.
iGuide Knossos is a HD/3D VR reconstruction of the Knossos palace.

meant to be used as a VR edutainment environment, providing a fertile ground for future development of educational, entertainment and action games such as Fruzzle, Knosseau and Knossos Labyrinth (thumbnails provided), which are using the Minoan civilization and myths as a foundation for their action play.

a. **wayGoo** *in-situ AR/VR tour of the archeological sites Knossos and Phaistos*, a blueprint paradigm for in-situ touring and experiencing archeological sites, that are partially or totally ruined, with the help of mobile and VR/AR technologies, that allow in-situ visitors to experience rich digital multimedia content (text, audio, video, including 360°, 2D/3D models and animations, games, etc.) and associate it with relevant locations and PoI's[2] in the physical site through wayGoo's geolocative and automatic navigation capabilities, **Figure 12**.

a. **AFIGISSI** (NARRATION) The AFIGISSI platform has been used in a number of pilot project to demonstrate its functionalities in curating digital cultural assets into experience that can be visualized using different technologies. We present two use cases next. One from the Teriade art museum of contemporary paintings in Lesvos, Greece [24]; and the other a curated audiovisual experience based on an imaginary narrative leveraging 3D assets from iGuide Knossos VR and visualized using projection mapping technology [25].

5.1 Digital curation of the Teriade museum exhibits using the AFIGISSI platform

The **AFIGISSI** (NARRATION) platform is developed to support, manage and promote digital content of cultural and tourist infrastructures (tourist sites, museums, archeological sites, exhibition spaces, etc.) through the creation of personalized individual and collaborative narratives. Access to narratives is possible either during a physical visit of an infrastructure during its regular operation (such as permanent exhibitions) and/or its temporary events (such as periodic exhibitions)

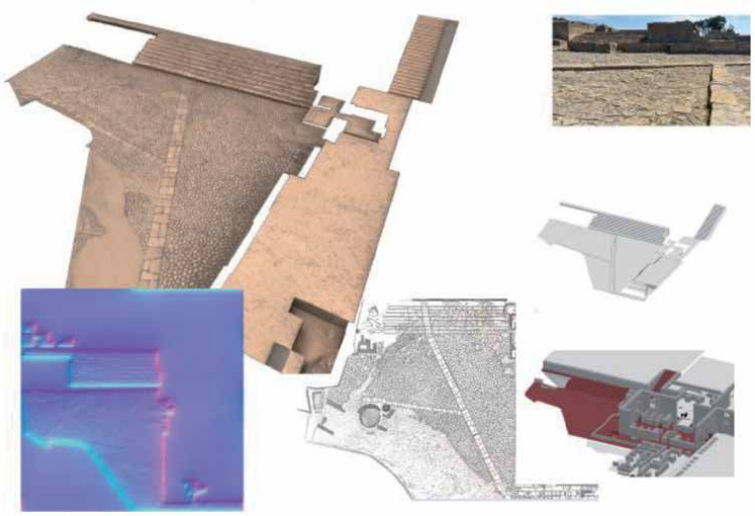

Figure 12.
Floor plans and drawings: Levi, D., 1976. Festos e la Civilta Minoica I, Rome: Ediz.dell'Ateneo. 3D modeling and application of materials [23].

[2] PoI: Point of Interest

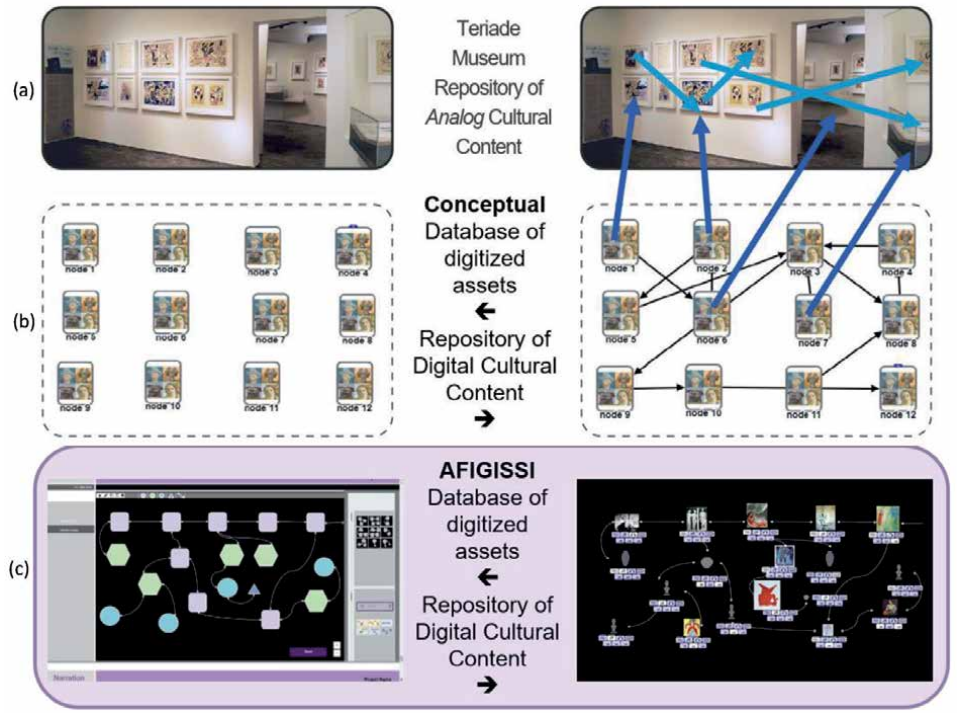

Figure 13.
a. Digital curation example using the AFIGISSI platform: Conceptual depiction of the transitioning: (a) from museum exhibits to digital assets, (b) from digital assets to digital exhibits, (c) from digital exhibits to digital narratives; and (d) from digital narratives to exhibits and their visualization with smartphones and VR/AR as in ***Figure 3a*** *and* ***Figure 3b****, respectively.*

or remotely. The project reveals cultural content by implementing new narrative structures, less strictly defined scenarios, automated and semi-automated modes, by overturning time sequences and by offering a variety of filtering and grouping options to respond to modern perceptions of versatile objects and their multiple interpretations. The platform allows specialized and non- specialized users to produce narratives based on the available content and to share them with targeted audiences. The curation of the (digitized) exhibits of the Teriade museum has been used as a pilot use case for demonstrating the ability of the AFIGISSI platform to store, manage, curate digital content in accordance to a narrative, and transform the curated outcome into an experience that can be visualized with smartphones and VR/AR technologies, **Figure 13a**.

5.2 From i-guide Knossos to the journey of Ariadne

An audiovisual projection mapping installation inspired by the world of Knossos and its digital interpretation and constitutes a blueprint for the creation of an immersive digital experience (Ariadne's Journey) from 3D digital assets and animations created within iGuide Knossos for the reconstruction of the ancient Minoan Palace of Knossos in Crete, Greece, an original narrative that addresses the process of knowledge discovery through excavations of historic monuments, and history itself, by a young contemporary girl, and the visualization of the outcome of this curatorial effort with VR technology and projection mapping [5, 25]. The narrative, artistic and spiritual field of Ariadne's journey explores the construction of memory and the meeting points of the historical

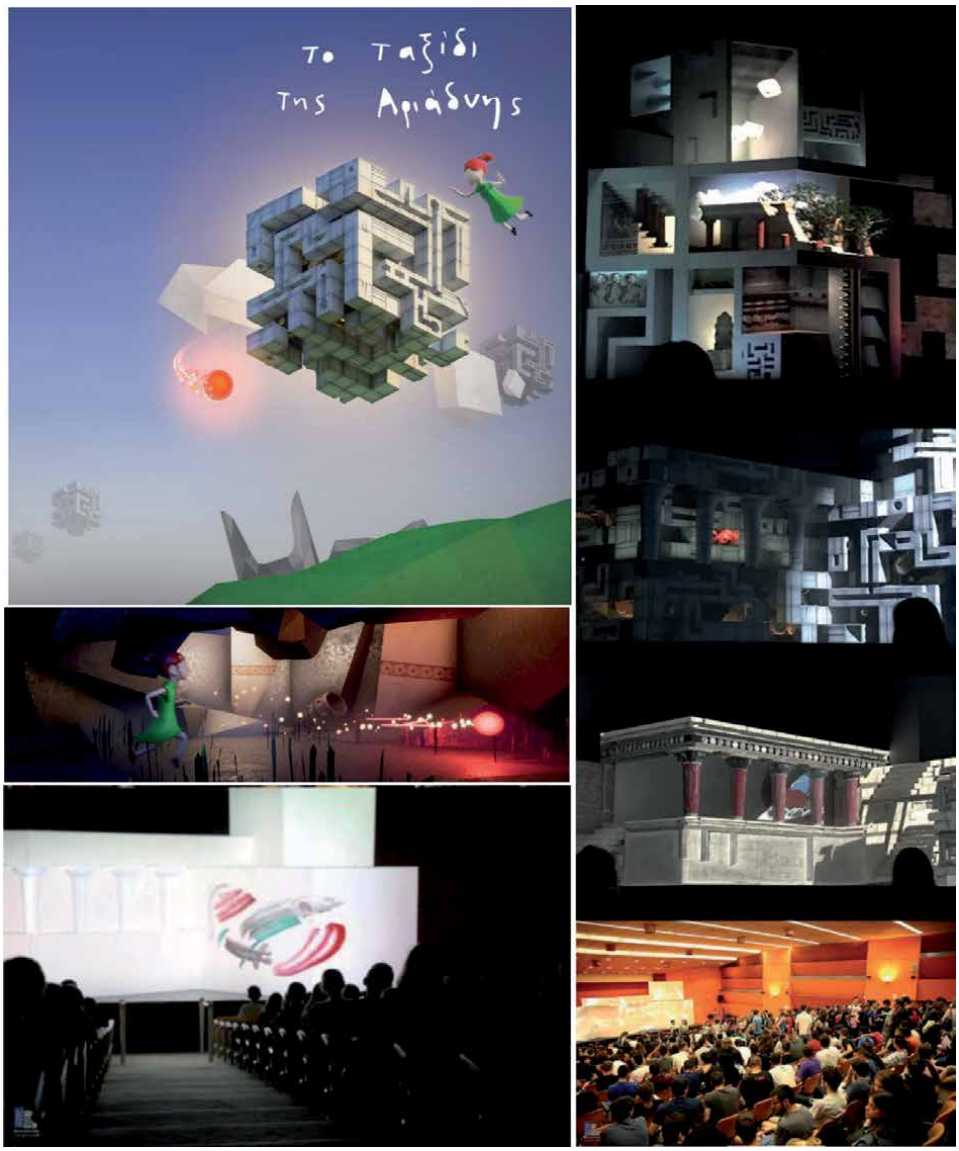

Figure 14.
Ariadne's Journey concerns an audiovisual projection mapping installation, inspired by the people of Knossos. Ariadne leaves the city behind to discover a fantasy world, created from familiar and strange images, where the myth, the archaeological hoe and the dreamy mood are intertwined in a colorful fantasy puzzle. Ancient ruins are transformed, frescoes come to life [23].

and mythological constructions that experience the unexpected journey of a young modern heroine. Through esthetic narrative, the work aims to create an experience for listeners of all ages, translating, or perhaps more accurately, the interpretation of CH images and historical documentation into a living esthetic vocabulary, **Figure 14** [23].

6. Conclusions

In this chapter an extended description of the SYNTHESIS Platform of Platforms (PoP) has been given. The architecture and the three platforms

SYNTHESIS is based on are described in detail. SYNTHESIS results from the integration of the three platforms iGuide, Narration (Afigissi), and wayGoo, in a coherent environment that allows the seamless creation of augmented digital assets, their management and curation in the context of a narrative, and the creation and visualization of digital experiences with mobile applications and VR/AR technologies. SYNTHESIS is the outcome of an over a decade research and development at the Integrated Research Laboratory at NCSR Demokritos towards the development and implementation of the Digital Immersive Cultural Environment (DICE) concept. Examples of three different digital immersive experiences that have been developed as DICE applications to demonstrate the capabilities of SYNTHESIS as PoP for creating digital experiences, have been given. SYNTHESIS supports blockchain and smart contract technologies that are used to protect IPR's and enable smart contracts to safeguard the use of digital content and encourage the creation of new digital content, its curation and distribution by protecting the IPR's of the creators and honoring contractual obligations and revenue streams agreed upon between creators of digital experiences and distributors of these experiences,

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SYNTELESIS: Innovative Technologies and Applications Based on Internet of Things and Cloud Computing National projects, November 1, 2017 - April 30, 2020.

AFIGISSI (NARRATION): Integrated system for management and curation of digital content and production of personalized and collaborative narratives, National project, European Union- European Regional Development Fund, Contract No. T**1**EΔK-**03584**, June 4, 2018 - December 3, 2021.

COSMOS: Cultural Osmosis - Mythology & Art, National project, European Union- European Regional Development Fund, Contract No. T**1**EΔK-**04283**, July 9, 2018 - August 31, 2021.

TMI Builder: Tailor Made Itinerary Builder, National project, European Union- European Regional Development Fund, Contract No. T**1**EΔK-**03580**, July 9, 2018 - August 31, 2021.

FLYSEC: Optimizing time-to-FLY and enhancing airport SECurity," Programme: Horizon 2020, European Union Grant Agreement No. 653879, Duration: 01/05/2015 - 31/07/2018, http://www.fly-sec.eu.

TRESSPASS: Robust Risk Based Screening and Alert System for Travelers and luggage, Grant Agreement No. 787120, Call: H2020-SEC-2016-2017-2, https://www.tresspass.eu/The-project.

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Section 3

Sustainable Development

Chapter 16

Bore Pile Foundation Construction without Caused Fine Cracks at Three Heritage Building

Nusa Setiani Triastuti

Abstract

Bore pile foundation close heritage building should be no damage. Install the bore pile process had to perfect, nonporous concrete, no necking, no sliding soil, no mixed deep water, Objective the construction of bore pile near heritage buildings did not deformation and no crack. The case study methodology was surveying the process of the installation bore pile at the soft soil. Analyzing the results of the loading test, the process of installing bore piles with limited space, without damaging heritage buildings. Monitoring will determine the success of the bore pile structure, including a slight decrease in the water table in the area and outside the building site. The vibration drill equipment damped by the trench so that it was safe from cracks in the heirloom building. Monitor the mud content in the water that went out at bore done of soil, monitor concrete every 2 m depth of bore pile the volume of concrete the heirloom building was not damaged. Axial bore pile test, lateral test according to design.

Keywords: reduce vibration, trench, cut off the vibration waves, no crack in heritage building

1. Introduction

Heritage buildings must be a true original, only cleaned and painted in a similar color, which should be taken care of when any construction was nearby. Heritage buildings could not change from the original, so that if the defect could not be like the original, Care must be taken to implement the three basement floors which are very close to the three heritage buildings with shallow foundations and high groundwater. In addition, the heritage building sits on 1.5 m fill soil. The fill soil and foundation shallow of the heritage building are very susceptible to ground active pressure, vibrations, and groundwater subsidence. The influence of the organic content on the compaction and consolidation characteristics of highly compressible organic clay (**Figures 1** and **2**) [1].

The 3-storey basement research building used a bore pile to a depth of 39 m, groundwater -1 m was removed from a pile hole with a diameter of 1.2 m and 1 m which needs to be monitored for the reduction in groundwater around the heritage building and the impact of large vibrations. The foundation strength followed on the soil layer type under the foundation [2].

The variation type soil and rainfall, the more difficult of structure.

Figure 1.
Three heritage buildings at research area.

Figure 2.
Heritage research area.

According to Suyono and Kazuto [3] the type of sub structure had to analysis include that's

a. Selection of suitable foundation type. Type of soil, bearing capacity, hard soil depth

b. The large load included vertical l and dynamic loads

c. Heritage building area with a limited project footprint. Foundation work had to not damage heritage buildings and environments

d. Duration and budgeted for a work project as targeted.

e. Some disadvantages of bore pile foundations with limited space and very close to heritage buildings:

f. Dirty land, mud (soil mixed with water from the borehole), reduce the dirty with mud wrapped in plastic

g. Drilling hole may proceed with the density problem if the soil was an easy collapse, then use bentonite overcome avalanche

h. Space was limited. Installed the reinforced concrete and casting

i. The water that flowed into the borehole reduced the bearing capacity of the soil toward the pile. The water from the drilling was fed back into the water pool.

j. Install a temporary casing so that the ground does not enter the borehole

k. To prevent drill vibrations, a 40 cm wide channel 2.5 m deep is made outside the basement area to break the waves. The channel was given a barrier so that the ground does not collapse from vibrations

The bore pile has the highest bearing capacity and is the fastest way to support the load. Undoubtedly, the bored pile system has its advantages and disadvantages. This is the most important requirement of geotechnical engineering [4]. The advantages of drill foundation, install:

a. Deep foundation with less vibration than piles

b. Vibration had to be reduced/eliminated so as not to crack the walls of the heritage building

c. Above the bore pile, the column was placed directly.

d. Drilling equipment could be penetrating rocks, but hammer no penetration rock.

e. Bore pile diameter was large compared to a piling. The lowest end drill pole could be larger to increase the bearing capacity.

f. No risk of bore pile was uplifted.

2. Objective

The construction of the bore pile near the heritage buildings, but the heritage buildings remain intact without slight cracks

3. Methodology

Case study, the author plans the work by paid watched to the site of limited area, 4 sides of heritage low building and old buildings with shallow foundations, the site attentions were carried out since preparing construction planning, observing vibrations, the impact of drilling machines, monitored the groundwater level, the bore pile processed, to the end of the hole in terms of quality water The concrete volume that enters the bore pile every 2 m was monitored according to the volume calculated based on the design drawing. Analyzing the results of the loading test based on the soil test. The dry drill construction was using an ordinary bore bit (spiral plate) that was rotated while being put into the ground using drill equipment and diesel power.

Axial load carrying capacity bore piles depend on the drilling method, concrete quality, concrete method, staff experience and soil conditions [5].

Bore pile construction were as follows:

a. The bore pile location was plotted according to the shop drawing

b. Installation of the bore pile so that the ground did not fall out, a temporary casing was installed

c. Installation of the bore pile so that the ground did not fall out, a temporary casing was installed

d. Drilling equipment was installed and theodolite was installed to monitor vertical alignment

e. The depth of the bore pile was 36–40 m so that the 18 m length tool was used gutter to pump that the concrete was cast the lowest hole and groundwater quickly enters the drainage

f. Checked by Field Inspection to ensure drilling reaches Toe Level

g. Installed reinforced concrete in the drill hole, according to the shop drawing

h. Drill pile using diesel engine and vibration was damper due to a trench

Groundwater monitoring in the project area and at neighboring sites and the drilling process was observed water and soil.

To control the concrete volume of cast for every 2 m height of the cast, the diameter of the drill pile was 1 m and 1.2 m so that the bore pile was solid/not hollow so that the quality of the concrete was met.

4. Result

Heritage buildings, did not deform, no cracks, even fine cracks did not occur. This was because the vibration waves were suppressed, the groundwater around the heritage building was kept, not descending. The environment was protected from liquid waste, solid waste, and heritage buildings were closed, so they did not get dusty. The success of the heritage building as before, had not changed because of the vibration protection, fixed ground water level, heritage building dust protection. Bored piles are significant elements for foundation. Supervise the productivity, estimating cost and the time of the process construction [6].

5. Discussion

In bore pile construction things that must be considered were

a. Drilling speed depends on soil type. Wet soil was very difficult in the process of soil disposal

b. Avoided soft bore holes, so that they do not collapse and the diameter hole reduced

c. The holes are always kept dry so as not to add the water mixture to the concrete, besides that, placing the drilling machine was easy and steady when the holes were dried

d. Reinforced concrete followed the shape of the holes

The results showed that the method of bored pile was little complicated compared the concrete pile method. The concrete pile method was more effective and efficient than the bored pile method based on time and cost of the construction method [7].

The control did were:

a. Groundwater level was monitored every day. When groundwater falls quickly to fill, it was the fact that groundwater does not drop in the research location.

Installed 6-point holes for measuring groundwater subsidence (**Figure 3**).

The development of the system has changed the conventional drill pile construction management, to improve efficiency and progress project information [8]. Control of the vibration by giving a sign to the heritage building had not changed. This was because a trench was made around the heritage building, so that the vibration waves were not continued.

A distance of upper-level A, length to B was measured every time, Length B difference each time indicated a drop in water ground. Distance A level with length B indicated C level. Difference peil C to peil D, it means water ground level drop.

Controlling of the dewatering hole 1: At times 15 o'clock shows length B was 6100 mm, tomorrow hours 15 showed B length was 6050 mm, groundwater 50 mm was dropped, so little did not affect the buildings at the site

b. Knowing the end bearing by paying attention to the level of mud in the water that comes out during drilling, if the water being drilled was clear it means the drilling has reached hard ground i.e., sand and stone.

c. Casting one bore pile at a time, so that the concrete unites/monoliths. High-pressure concrete pump, so that groundwater was drilled out into the channel. Every time was installed for casting concrete, so that the fall the concrete was low, avoiding segregation

d. The concrete volume was controlled 1.6 m3 for 1 m and 2.3 m3 the 1.2 m hole diameter so that necking occurred as early as possible. Each concrete casting was carried out compaction.

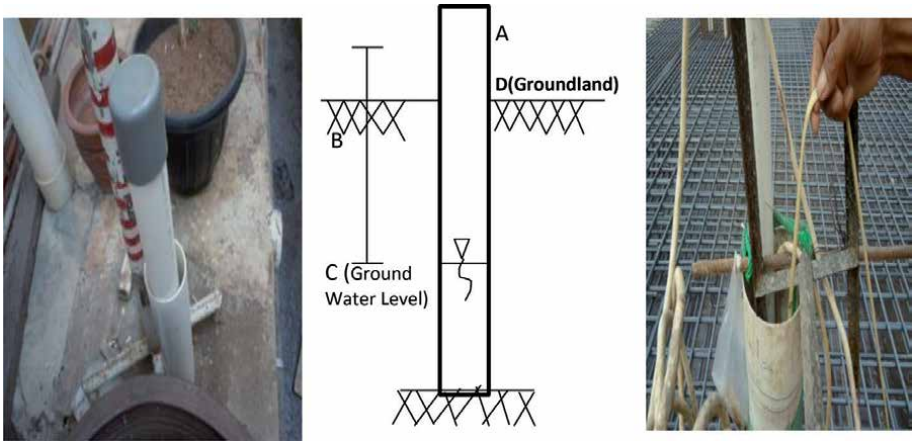

Figure 3.
Water level ground measurement used multi meter tool in the (OW 1 until OW6) point.

Figure 4.
Bore pile equipment.

Figure 5.
Tensile test of load at bore pile.

e. The cleanliness of the concrete, iron and the number, distance, dimensions of the control are put into the borehole.

f. 2000–2120 tonnes compressive axial test results exceed 200% design load and 200% bore pile tensile load, displacement was 12.05 mm (**Figures 4** and **5**).

Researchers and construction managers are aware of rising and falling water level at hole, high water level in the study site

$$h = z + U / \nu w \tag{1}$$

h = height total pressure at one point.
point z = elevation power at height.
U = pore water pressure.
Ɣw = water/unit weight.

6. Conclusion

Three heritage buildings did not do deformation or failure, because level water was little drop and trench were reducing vibrations Prevention was carried out so that heritage buildings did not experience deformation by controlling and prediction of the construction. Other information the tensile test, the compression test got more than 1400 tones, it was 200% of design load bore pile were 1200 mm, 1000 mm and rate of displacement was 12.05 mm smaller than analyzed

displacement clearance 25 m. The result has been eligible as just as to the design needed. The bored pile was diameter 1000 mm and 1200 mm reached the excellent quality.

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Chapter 17

Structural Consolidation of Architectural Heritage

Carlos Franco

Abstract

The present study has as its main objective, the search and development for a model of evaluation and diagnosis of the origins of pathologies, in a rehabilitation process of architectural heritage that allows possible corrective measures to be applied at an early stage of appreciation, defining rigorously the reinforcement and consolidation options necessary to improve the overall construction performance. Understanding the original tectonics of the building, becomes essential for a conscious and adequate performance decision-making in an intervention that is desirable to be minimal and not intrusive, facilitating the optimization of solutions depending on the state of conservation in which the building is. Historical and morphological characteristics of the construction were considered, in order to define and study the best solutions for an appropriate intervention. The proposal for structural stabilization, from the perspective of greater sustainability, observes all the requirements and recommendations of the international charters on heritage rehabilitation - in addition to national legislation, the contemporary intervention principles, guaranteeing the safeguarding of its identity.

Keywords: Architectural heritage, rehabilitation, original tectonics, construction pathologies, structural stabilization

1. Introduction

Taking advantage of a case study that was once carried out on a building in the entire state of neglect, for its research and its unequivocal architectural value, with a view to transmitting the scientific and technological knowledge and consequent endogenization then acquired, all the information collected was compiled. to the date and before the intervention in the meantime, including photographic records already in the initial phase of the work.

The work presented here aims to establish an intervention methodology - in an approach directed to the evaluation of the structural system, defining as a priority the global stabilization of the building.

The prior assessment of the building's state of conservation, through the on-site observation of pathologies and anomalies caused by years of neglect, makes it possible to define an appropriate concept for structural stabilization, which may be replicated in similar buildings, not only in Portugal as well as in any part of the world where there are examples of recognized architectural interest, favoring the adoption of less intrusive solutions, betting on the recovery and rehabilitation of materials and traditional construction techniques that are part of the set of cultural values materialized in the building, where adaptation to the new regulatory

requirements for use and structural performance, constitutes an additional challenge to which it is intended to respond, in order to satisfy the requirements of comfort, functional efficiency and sustainability.

Prior to interventions in classified Architectural Heritage and in the design phase, not only the applicable national legislation should be considered, but also the letters and recommendations, criteria and international standards on the protection of Architectural Heritage.

The studies and projects for the works of conservation, modification, reintegration and restoration in classified properties, or in the process of being classified, will have to be elaborated and subscribed by technicians of legally recognized qualification or under their direct responsibility, for which the works or interventions, will be subject to authorization and monitoring by the competent authorities for the final decision of the classification procedure.

Portuguese legislation establishes the bases of the policy and regime for the protection and enhancement of cultural heritage - Law n° 107/2001 of 8 September, in conjunction with Decree-Law n° 308/2009 of 23 October, defining the concepts, rights and duties of the owners of heritage with relevant cultural interest, namely architectural, with values of memory, antiquity, authenticity, originality, rarity, uniqueness or exemplarity, being a fundamental task of the State and duty of citizens, their protection and enhancement [1].

2. Case study

"The houses that are capable of proposing this decisive encounter are, without any doubt, great architecture. AND, like all successful models, they have a broad and mixed

Figure 1.
Casa Sommer – 3 D model (Geostar, levantamentos arquitetónicos).

ancestry where art permanently intersectswith the life(s), which is another noble functionof architecture" [2].

The case study presented evaluates an important 19th-century example of private housing construction – Casa Sommer (**Figure 1**), in the heart of the historic center of Cascais, Portugal, simultaneously combining two trends - romantic and neoclassical, two most relevant stylistic currents at the international level of the 19th century.

As main characteristics of this type of architecture, it stands out its orthogonal lines, the regular, geometric and symmetrical shapes as well as the columned portico. Consisting of an almost quadrangular plan (10.24x11.73 m), with three overlapping floors, with an approximate area of 132.00 m^2 per floor, shown externally on the facades through cornices that form architraves. Its verticality is assumed by the elevation of 2.60 m of the noble floor in relation to the street, imposing itself in this way on the public square.

The vertical communication between the different floors is ensured by the staircase strategically placed under the transversal axis of the building, in which the openings in the east façade ensure the natural lighting and ventilation of the interior space. The portico of columns with a square shaft, based on a square base, supporting the porch balustrade in stone, imposes the main entrance of the House.

3. Structural characterization

3.1 Exterior and interior walls

The building was built from an almost quadrangular base (10.24x11.73 m), a geometry that gives it favorable performance in terms of seismic behavior. The outer walls were built in irregular masonry of two-piece stone, cut out on both sides and with horizontal paneled orientation, of the type of masonry with mortar joints, filling the inner core with smaller stones [3]. In this constructive typology, the stones are laid on top of each other - in a joint forest, wrapped in lime and sand mortar - usually at the time with a 1: 2 line, in which ceramic shards and stone frames are transversely inserted in order to fill the gaps. Empty spaces, giving not only better adherence of the elements but also allowing the execution of regular beds for the laying of successive layers.

The walls are supported by direct foundations, in a simple extension of them with widening already in the ground, of identical constructive composition. The thickness of the wall is variable: 0.75 m from the foundations to the level of the landing of the front staircase; 0.65 m from this level to the threshold of Floor 2; 0.60 m in the outer envelope of Floors 2 and 3.

The start of the cornerstones in the form of pilasters, aims to increase their area of contact with the terrain and consequently an improvement in the distribution of loads, takes on a projection resulting from the difference of its base geometry of 1.00x1.00 m, from the foundations to dimension of the level of the frontal staircase, from here it is reduced to 0.80x0.80 m. It was common for lime mortar to be applied to the plaster 1: 3.

The renders were executed in successive layers, thus managing to minimize the cyclical effects of the contractions / expansions to which the different materials are subjected, considerably increasing the durability of the work as a whole. The interior walls of the Ground Floor (**Figure 2**), are also made of irregular stone masonry, completely identical to the typology of the exterior walls, with the exception of the thickness which is 0.40 m thick, forming the start of the stairwell and the support of the walls of the axial corridor of the house, give the necessary stiffness to the general foundation of the building.

Figure 2.
Structural walls.

The interior walls in wooden partition (**Figure 3**) of the remaining floors have not only the usefulness of compartmentalization of spaces but also the function of structural locking of the building *"in the old buildings they almost always play a structural function of relief, since the building itself the architecture of the buildings, the organization of the spaces and the structural limitations of the available elements cause the resistant capacity of most of the walls to be mobilized* "[4].

The partitions made up of a structure made of wooden cones, in a set of vertical, horizontal and diagonal pieces - crosses of St°. André (**Figure 3**),

Figure 3.
Wood partition wall structure.

carved and nailed so as to allow them to fit simultaneously with each other and with the braces, establishing the connection to the floors. The horizontal lath of trapezoidal section, also in a little house, serves as a support for the plastering of weak sand mortar and aerial lime, whose usual feature at the time was 1: 3, (weak retraction and weak mechanical resistance, giving good adhesion to the base and good workability) [5].

3.2 Floors

The structure of the pavements of the raised floors is composed of elements in white wood, applied in the form of Portuguese-style flooring, with a thickness of 0.03 m and a variable width (0.12 / 0.15 m), resting on beams with 0.17x0.08 m arranged in the direction of the smallest span, built into the outer walls, with a distance of 0.36 m from each other (**Figure 4**).

3.3 Roofs

The roof is made of white cone wood, with symmetrical hipped roof, with a structure made up of two trusses, fixed to the crevice existing in its perimeter, interconnected by bars and slats to support the ceramic tiles (**Figure 5**).

The structural typology of the roof, together with devices for connection to the exterior walls, using metal parts called bolts (**Figure 6**), anchored on the outer side of the wall, in the transverse direction of the beams, as a whole guarantees the necessary bracing of the building [6].

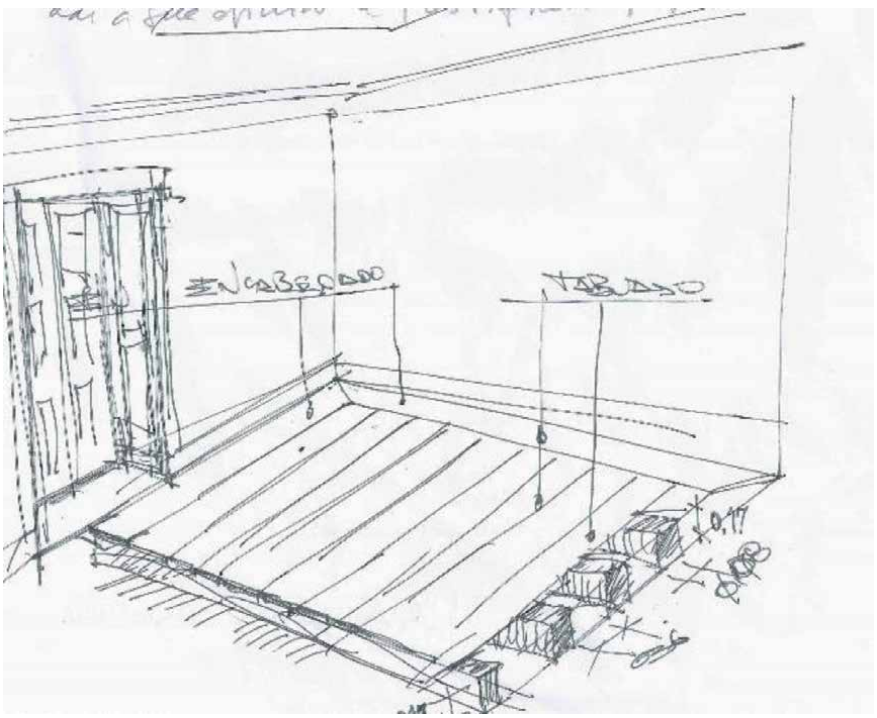

Figure 4.
In situ survey of the wooden floor structure.

Figure 5.
Wooden structure of the roof.

Figure 6.
Metal bolt.

4. Determination of the anomalies index

To determine the level of conservation, while visiting the building under analysis, based on the inspection of visible anomalies according to the evaluation criteria and rules contained in the Evaluation Form developed by LNEC, in the framework of the preparation of the NRAU. The National Laboratory of Civil Engineering (LNEC) thus conceived the method of assessing the state of conservation of buildings (MAEC) which aims to determine with rigor, objectivity and

transparency the state of conservation of buildings and the existence of basic infrastructures., which is completed in Appendix 1, approved by Decree No. 1192-B / 2006 of 3 November, published in the *Diário da República*, 1st series— No. 212—3 November 2006, integrating the relevant elements to determine the level of conservation, under the terms of paragraph 2 of article 33 of Law no. 6/2006, of 27 February, which approved the New Urban Lease Regime (NRAU).

The ordinance establishes the general assessment criteria in number 1 of Article 3: The assessment of the level of anomaly that affects each functional element is carried out by combining the following four criteria:

a. Consequence of the anomaly in satisfying functional requirements;

b. Type and extent of work required to correct the anomaly;

c. Relevance of the locations affected by the anomaly;

d. Existence of an alternative for the affected space or equipment.

Based on the survey, the Evaluation Form was completed (**Table 1**), using the simulator made available for this purpose at the email address: https://www.portaldahabitacao.pt/pt/nrau/home/simuladorFichaAval.jsp.

In the presence of classified heritage, a strategy based on an "observational approach" should be chosen, however, assiduous verification is guaranteed during the course of the intervention, the effectiveness of the measures corrective measures to be proposed in order to guarantee the necessary adjustments in face of the reality that will be found on site [7].

The main anomalies found in the survey carried out on the building, with special concern for the structural state of the construction, should be pointed out on the designed parts, previously prepared for the purpose - plans, section and elevations, which may be considered an undisputed target for correction and / or Repair.

The evaluation of crack openings was based on the lessons of classes given by the late Professor Doctor Architect António de Santa Rita, as it is considered a simple and objective method, therefore suitable for this type of analysis.

DETERMINAÇÃO DO ÍNDICE DE ANOMALIAS		
Total das pontuações		**153**
Total das ponderações atribuídas aos elementos aplicáveis	61	
Índice de anomalias		2.51
AVALIAÇÃO		
Com base na observação das condições presentes e visiveis e nos termos do artigo 6º da Portaria n.º 1192-B/2006, declaro que:		
Estado de conservação do locado:	**Mau**	
Estado de conservação dos elementos funcionais 1 a 17:	**Médio**	**Calcular**
Grave risco para a saúde:	☑	

Table 1.
Results of the evaluation form.

Cracks in masonry walls are classified according to related criteria, with the size of the opening, the activity, the shape, the causes, the direction.

The classification of cracks, according to their respective causes, is perhaps the most suitable method for studying these pathologies, as the solutions to the problem will be defined from this analysis.

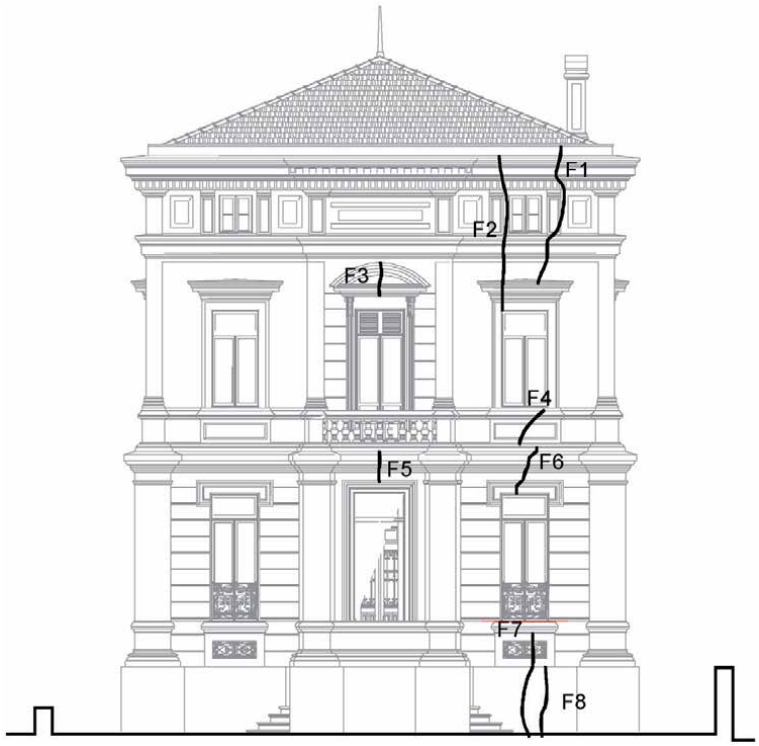

Figure 7.
South facade with crack location.

Figure 8.
F4 fissure (inside).

Figure 9.
F5 fissure.

Based on what is described in the crack classifications, the basis for cataloging the typical configurations of cracks in masonry was elaborated, registering its location on the elevations of the building.

South wall: cracks of considerable openings, caused by the foundation of the southeast corner foundation, as a result of a greater traction effort in the west / east direction, which should deserve special attention in the intervention proposal (**Figure 7**).

Fissures F1, F2, F3, F4 (**Figure 8**), F5 (**Figure 9**), F6, F7 and F8 are thus considered as wide cracks, whose activity needs to be monitored, with diagonal orientation of causes related to the laying of foundations.

5. Survey of pathologies

In order to systematize the information collected in situ, a List of Pathologies was elaborated, based on the studies of Pathologies of buildings carried out by the Laboratory of Physics of Constructions (LFC) of the Faculty of Engineering of the University of Porto (FEUP) in collaboration with the Group of Construction Pathology Studies - PATORREB. Grouped in a set of Pathology Cards (Annex 2), where they describe not only the problems found, but also their main causes, methods of evaluation and possible solutions for intervention.

For a better interpretation and an adequate diagnosis, it will be necessary the records, elaborated during the previous inspection carried out to the building, expressed on the elevations and plans, of the pathologies found not only in its exterior surroundings but also in its interior space (**Figures 10** and **11**).

In addition to the inspection carried out, the complementary photographic record becomes essential for an illuminating reading of the situation found during the evaluation. A complete photographic survey of each facade should then be presented, focusing on the main existing anomalies.

The pavement in contact with the ground has a high degree of humidity as a result of the deficiency or absence of an adequate imperialization, consequently

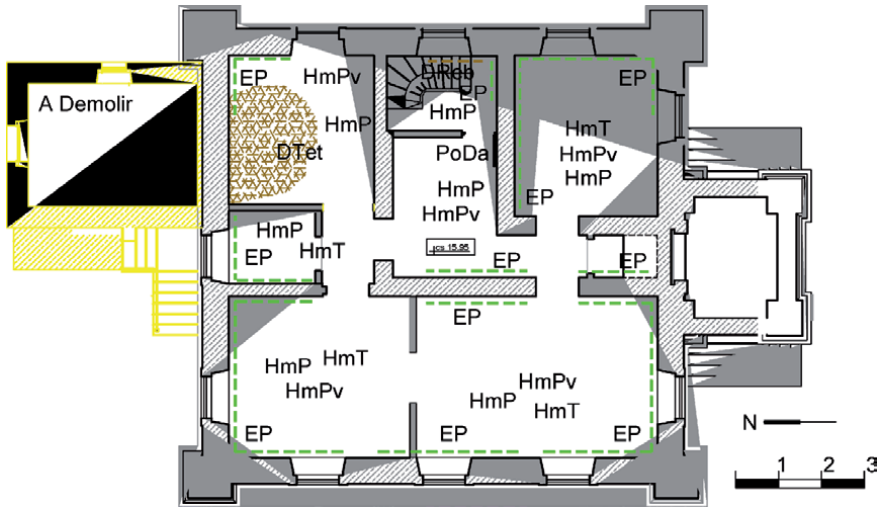

Figure 10.
Record on the pathology plan.

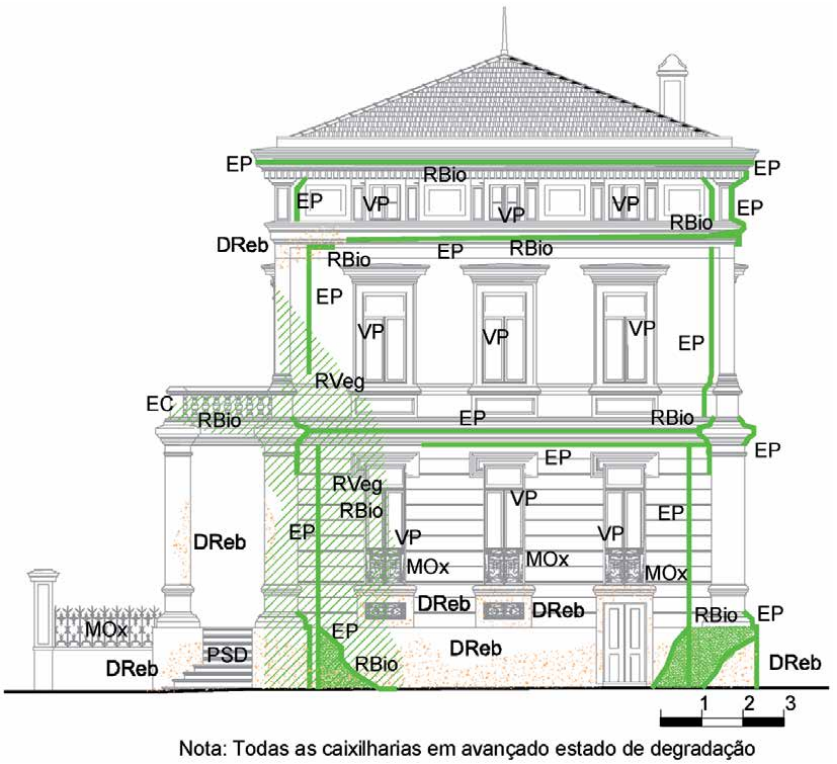

Figure 11.
Register of pathologies on the nascent facade.

allowing the direct entry of rainwater into the interior space, causing damage directly to the pavements and baseboards and, furthermore, by capillarity, causing blistering and plaster breakdown.

The slab of the 2nd floor terrace, which is supported by the entrance porch, is aggravated in addition to anomalies similar to those detected in the kitchen slab, due to its exposure to the aggressive external environment.

These pathologies result from depassivation corrosion of the metallic structure, in a reaction induced by carbonation, due to the presence of a structure with environmental exposure to air and humidity (**Figure 12**) caused by marine salt water chlorides, transported by air as it is close to the sea.

According to the classification of Standard NP EN 206–1: 2007 (Environmental Management Study Notes - Specification, Performance, Production and Compliance), which establishes aspects related to concrete, namely the specification and performance in accordance with environmental exposure, taking into account one of the main factors of attack on concrete containing reinforcement or with metallic elements:

- Attack on armor or other embedded metals (corrosion induced by carbonation or chloride ions).

Figure 12.
Corrosion of metallic elements.

Figure 13.
Floor of the Sanit. Installations.

Figure 14.
Ceiling under the Sanit. Inst.

Due to its location, the building that was the object of study, we can attribute Class XC 3 to corrosion induced by carbonation, and also Class XS1 to corrosion induced by marine chlorides of salts originating in salt water, from sea water, transported by air, as it is close to the sea.

Floor 2 and Floor 3 - floors and support structure in the areas of the sanitary facilities are rotten, an anomaly caused by ruptures in the water and / or sewage systems, highlighting the fact that it is on the floor which facilitated the collapse of the adjoining floor ceiling (**Figures 13** and **14**).

6. Proposal for structural stabilization

"utilitas, venustas e firmitas", Vitrúvius (1st century BC): Its standards of proportions and its conceptual principles - utility, beauty and solidity.

Since antiquity, although restricted to a limited territory from Roman times, there are registers of regulatory norms on heritage protection: Decree of about the year 44 AD, discovered in the historic city of Herculano, Italy - forcing anyone to demolish a building for speculative purposes to pay the authorities twice the purchase price. During the period of the Roman empire, an Edict dated 17 July of the year 389 appears - *"It is forbidden to disfigure the exterior ornaments of private buildings with modern additions and damage the historic buildings of an important city for reasons of greed, for the sake of profit".*

Pope Gregory I (590–604) proposes and practices a policy of reusing the immense Roman legacy abandoned after fall of the western Roman Empire. The great patrician domus are turned into monasteries, their halls of reception in churches. He warns his missionaries not to destroy the pagan temples and buildings, but rather by the otherwise they must be preserved and prepared and properly adapted - placing their altars and their relics, for Christian worship [8].

Eurocode EC 8, part 3 - *"Assessment and rehabilitation of buildings",* establishes the criteria for assessing the seismic performance of existing buildings, describing the approach regarding the corrective measures to be taken. It also establishes criteria for measures to repair and / or reinforce structural elements in the design

and final dimensioning of the new elements to be introduced and their necessary connections to the original structural system.

The structural elements in wood, together with the masonry, are of equal importance for the stability of the building. Due to its great vulnerability to deterioration agents and in view of the need to adapt the construction to the new uses and safety criteria currently required, it is absolutely necessary to provide for an adequate intervention, aiming at increasing the resistance of the deteriorated element, either through its reinforcement using new materials and / or by reconstructing the section with anomalies, using the same material - with or without connecting elements [9].

Using a basic model that intends to represent the genesis of structures designed by man, an attempt was made to conceive an Archetype, which in a simple and schematic way summarizes the structure of the study.

Prostheses introduction - shown in black in the photograph, for the damaged sections of the element: Type A repair: in its lower support (**Figure 15**); Type B repair: on its upper support (**Figure 16**); Type C repair: wherever there is an anomaly (**Figure 17**); Type D repair: integral replacement of the element (**Figure 18**).

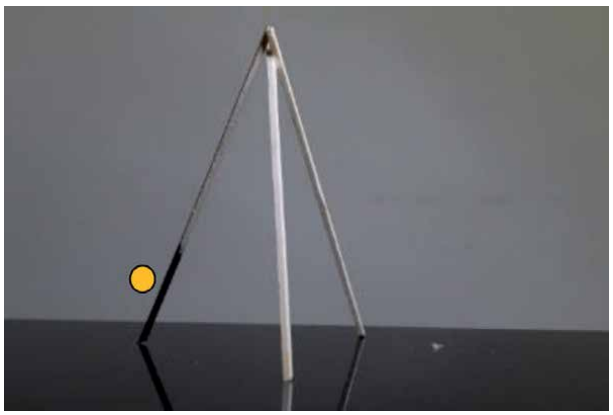

Figure 15.
Prosthesis on the lower support.

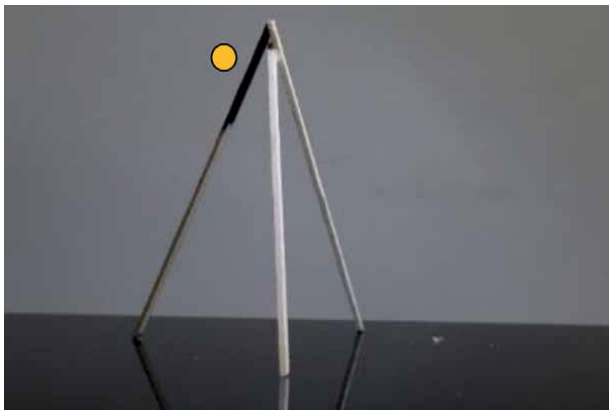

Figure 16.
Prosthesis on the upper support.

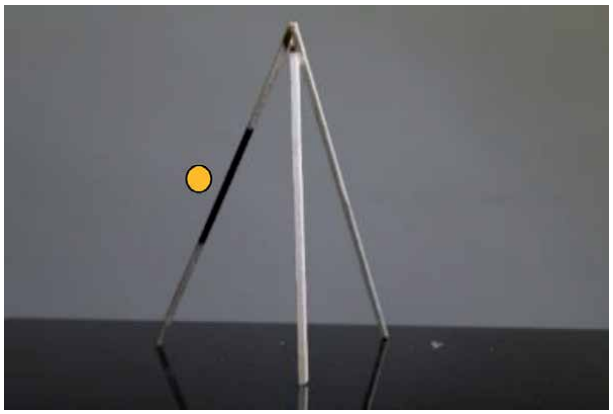

Figure 17.
Prosthesis with variable location.

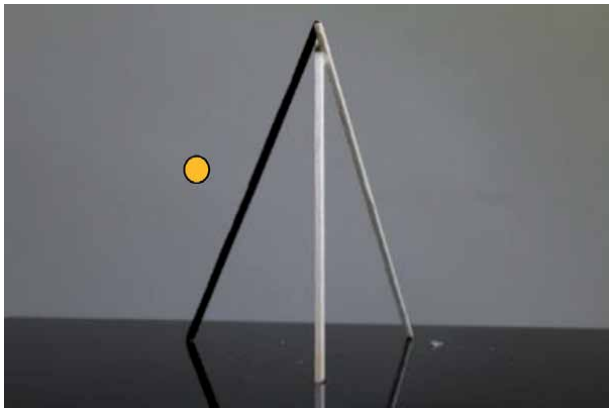

Figure 18.
New replacement element.

7. Final considerations

Knowing and understanding the structural concept of pre-existence, the materials and construction systems that compose it, in an approach and collection of information about the object, through the performance of visual inspections, soundings and / or tests that may be deemed necessary, will contribute to the design of a conscious intervention, sustained in the domain of knowledge resulting from a careful assessment of its pathologies and its causes.

The rehabilitation of masonry walls and wooden structural elements, due to the importance of their structural function in old buildings, is the object of most of the study and, consequently, of greater concern in the elaboration of intervention proposals. Notwithstanding the techniques to be adopted are classified as not very intrusive, they allow to achieve the intended objectives, without causing changes in the original structural scheme and in the various constituent preexisting structural elements.

The increase in the strength of masonry can be achieved relatively easily through reinforcement by confinement, by adding a new material (composites, mesh, sheets or metal profiles). The wooden structure must be preserved by the reconstitution / repositioning of the element with the same material and / or material different from

the original, or by the insertion of new structural elements, whose resistance can be mobilized in order to transfer the loads between the structure to be reinforced. and that new element.

The great challenge will be to guarantee the improvement of the building's overall behavior, as a result of the careful repair / replacement of masonry and structural wood, reestablishing its structural functions now reinforced by the intervention. We tried to develop an intelligible model, from which it is intended to expose the concept of the intervention that is defended.

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Chapter 18

From Preservation to Reuse – Seeing Possible Futures

Elizabeth Gardiner and Katarzyna Kosmala

Abstract

Appreciation of heritage by Scotland's communities has been inextricably linked with activism since the 1970s. Since then, European artists and local cultural producers have campaigned for future spaces and places that respect local histories, identities and heritage. In parallel, a polarisation within the arts, culture and heritage establishments has downgraded socially engaged practices: collapsing arts development and heritage preservation with cultural planning. In Glasgow, local people have fought a decade-long campaign to save A-listed dry docks, Govan's Graving Docks. We argue that the politics around saving the docks are superficially incontestable as a local community aspires to preserve an important heritage asset linked to their own cultural memory and pride. Moving beyond heritage preservation is more problematic. Post-industrial heritage is vulnerable to developer-led homogenisation and subsequently, gentrification. Artists, researchers and activists who, in good faith work with communities, fueling their aspirations and alternative visions for heritage futures, are in danger of becoming a part of the problem. We unpack some of the problems posed by the politics of power and ownership, exploring networks and new business models as keys to advancing a new paradigm for the future of heritage.

Keywords: community arts, regeneration, heritage futures

1. Introduction

In Scotland, a radical movement under the umbrella term of community arts that saw socially engaged interventionist artists working in partnership with local people to preserve their tangible and intangible cultural heritage mushroomed in the 1960s. The movement grew in sophistication as well as political impact and persuasion, and subsequently fractured by the end of the 1980s. Adapted and 'sanitised' by local authorities, it was brought 'in-house' to join community sports activity in learning how to paint or make sculpture.

Community arts as a radical movement has left various legacies that are visible today in a complex landscape of socially engaged arts, including participatory artists working with local people and groups, interventionist arts practice bringing art outside of the gallery spaces and public arts engaging public spaces to make political statements. All of these diverse practices continue to be applied across communities throughout Scotland and beyond.

Helen Crummy [1] and Owen Kelly [2] documented the impact community arts and activism had on arts, cultural and heritage establishments as well as local authorities, disrupting governmental attitudes towards the arts and culture, which hitherto had been regarded as quality only if espousing white, middle class values. The movement towards community driven arts practice got fractured in the 1980s; polarised between artists who regarded the art as a vehicle for political activism and those who believed the quality of the artistic practice to be paramount and would speak for itself without the need for a polemic.

A cultural planning-led movement born in the 1990s in Australia can be traced back to the Scottish community arts when a Scottish diaspora, including Grace and Kieren Grant of Easterhouse Festival Society and Mayfest [3] fled what they regarded at the time as the hostile, instrumentalist political environment of Labour-dominated Glasgow and established their practices in Australia. The cultural planning movement in Australia was documented by Colin Mercer [4] and others, and subsequently travelled back to Scotland via mainland Europe where it was championed by Franco Bianchini and Jude Bloomfield among others [5]. Cultural planning was explored as a method: borrowing from Geddes' *Folk Work, Place*; embracing not just physical planning practice, but also cultural mapping and incorporating heritage to impact the socio-economic agendas.

Therefore, with origins in the community arts movement traceable back to the 19th century Scottish geographer and planner Patrick Geddes, cultural planning (as applied in Scotland) advocated bottom up cultural and heritage sensitive community development approaches in city planning [6, 7]. In the late 20th century (in spite of growing traction and lobby voices through the National Cultural Planning forum and the Scottish Centre for Regeneration) these community-centered approaches were soon challenged by local authorities and practitioners [8] who saw the potential in more top down cultural planning approaches from local and national governments. Like community arts before it, the cultural planning movement had fractured by the 2020s. Matthews and O'Brien [9] proposed that we are now in a 'post post-industrial regeneration' period. With regeneration as a discredited concept, new thinking is now required for citizen led co-creation and co-production. Once again however, the debate oscillated on political ethics and values, polarising positions along value based fault lines.

The 21st century continues to be regarded as the post-industrial era for river and port cities throughout Europe [10]. At the end of the 20th century, without awareness of what was being lost, derelict shipyards, foundries and textile factories from the Victorian era were demolished. There is scant mourning at the passing of mass industrialisation with all its attendant problems of environmental pollution and community exploitation at the mercy of dominant private sector employers. The heritage, diverse habitats (human and natural), local histories and ways of life continue to be swept away with the detritus, however, creating a mono-culture of non-places in their stead. We argue that in the 2020s, cities and towns throughout Europe are now grappling with the 'how to' intervene in futures based on homogeneity: how to make space for distinctiveness and production; how to reimagine places where alternative histories can be heard and local visions not just imagined, but delivered.

2. Govan graving docks, Glasgow, Scotland

Govan in Glasgow, Scotland is one of those post-industrial locations where, throughout the 20th century, shipbuilding defined the character of both the local

people and their place. With much of that post-industrial infrastructure demolished, it has been replaced with homogenous housing and retail, which is gradually eroding both ancient Viking heritage remains at the important Water Row river crossing and the 20th century industrial infrastructure. Govan is a unique location. The area has long been recognised for its historical importance. With its medieval heritage, including Water Row the site of an ancient Doomster, or Moot hill, Ting site where the mediaeval kings of Strathclyde were crowned. Outdoor debates and legal courts were conducted there. Armies and goods forded the River Clyde.

Artist interventionism, community arts, and participatory arts practice initiatives have been delivered in Govan over several decades. Artists have supported communities to engage with its unique history, landscape and people (including travelling show people who have made the site their own for over a century). Charrettes, community consultations and artistic projects (some commissioned by the local authority but mostly self-generated) have been enacted. The results of every consultation emphasised the need for more heritage-sensitive development than was proposed in the outline planning. Intensive open days run by the developers and appointed architects, celebrated (or appropriated depending on your point of view) the work of the artists working with local people to create their own alternative visions and ideas. Housing and forced removal of the show people were both deemed unacceptable. In 2019, planning permission was granted for final plans for the Water Row area which are almost identical to the plans that were proposed prior to the consultation. The plans continue to prioritise housing and advocate forced removal of the show people from their homes.

In the heart of Govan, the 20th century industrial heritage site Govan's A-listed Dry Docks, commonly referred to as Govan Graving Docks, has been a prey to market forces for several years now. Land that was a common space with access rights for grazing of cattle pre 19th century was borrowed for industrial use. Shipyards respected those ancient access rights by laying boardwalks along the banks of the Clyde, which could be lifted and replaced allowing the launch of a ship. Access rights have, however, been conveniently forgotten in the 21st century and this common land is now being appropriated by developers for housing development. Sometimes, as in the case of Govan's Graving Docks, the owners *are* housing developers: proposing mono spaces of homogeneous housing and retail.

Since their closure in 1989, Govan's Graving Docks have been in private ownership and subject of various top down planning proposals for their redevelopment. The common sense of the economic narrative [11] dictates that the landowner (a housing developer) has the right to make a profit and a proposal for 750 high rise flats on this site was seriously considered. In parallel heritage sensitive, organic planning solutions were proposed by activists and artists together with local residents. These alternative proposals continue to nod to the ideas of 20th century geographer and planner, Patrick Geddes and were developed during a decade of interventionist, socially engaged community arts embedded in cultural planning practices. Local people dared to question why these rich, multilayered, heritage sensitive solutions are still not the default approach in planning.

Geddes worked with whole communities in Edinburgh and Kilmarnock, creating what we would now describe as community arts or participatory arts practice [12]. Through the 'outlook tower' device, he encouraged thinking about a place as part of a neighbourhood, as part of a city and a whole region, as a complex ecosystem of heritages, including landscape, history, buildings, stories and its people that must all be respected and included when any new development is envisaged. Geddes referred to the city as being in evolution, as a natural, organic process. Meller [12] admits, however, that Geddes is less clear on how local people can have power

and voice in the planning process. Today, Geddes is acknowledged as the father of cultural planning in Europe [13] and there are clues in his organic approach to city planning for the reuse as well as new uses of important post-industrial heritage like Govan's dry docks that would respect their heritage importance as well as incorporate the local social, economic and biodiverse cultures [14].

The authors of this chapter argue that despite the politics of planning practice, there is a role for the participatory interventionist artists in supporting local communities to create their future visions and challenge the vision resigned to homogenous housing and retail solutions. We argue that interventionist artists who embrace the radical community arts activism of the 1970s, prioritising both the aesthetic and social justice agendas, are best placed to open new dialogues, create shared future visioning and intervene in the default planning process on disputed areas, such as Govan Graving Docks. In spite of focused, artistic interventions around Govan's Graving Docks spanning several decades, however, there have been obstacles to moving cultural planning from theory to implementation.

Cultural planning methods are now supported by the Scottish Government policies around heritage, sustainability and community ownership [15]. They are also supported by the UK's Industrial strategy, which emphasises the need for re-industrialisation, as well as an emergent model for the post-industrial city. Cultural planning could possibly offer a solution, but like the community arts movement of the late 20th century, the cultural planning debate in the early 21st century lost its way. We argue that cultural planning impact was diluted by a confusion with arts development, cultural production and planning for culture. Therefore, cultural planning became embroiled in polarised positions about 'top down' versus 'bottom up' approaches. Although still potent and potentially a panacea, the potential for activation of its ingredients among decision makers has become marginalised.

In Govan artists, activists and local people continue their own reclamation processes, restoring the narrative of the commons over land ownership [16]. The 'common sense' narrative in Govan continue to be based on the dominant assumption that shipbuilding is gone forever and what is needed now are ways to preserve its memory. The assumption that this role is the preserve of museums and heritage-plaques is being challenged. Ships are being built all over the world, just not in Govan any more, in spite of having facilities, like its world class dry docks that could, indeed, be restored.

In 2020, a consultation process documenting local attitudes revealed that 90% of respondents wanted employment returned to the docks with an emphasis on heritage and tourism. By early 2021, the developer was working on new proposals for Govan Docks' regeneration that prioritised heritage, historic ship repair, training and employment which (whilst attractive and mirroring community's feedback) comes without guarantees of delivery. There is evidence that participatory artistic interventionism has been useful in the transformation of the overall narrative. There is little evidence, however, of what factors must be put in place if we are to move beyond the success of the artists as activist facilitators in creating new, compelling, shared-future visions and to be able to implement those alternative visions on the ground.

The fate of Govan's Graving Docks remains with the private owners, the City Council (who have power over planning decisions) and housing developers, who are also the owners. Because of activism, participatory interventionism, transformation of the narrative and pressure on the developer from local community, the proposal for 750 high rise flats had been rejected and the developer has come forward with new plans which incorporate heritage, tourism and an employment-focused strategy. Further investigation, however, reveals that what is being proposed are temporary-use pavilions and containers rather than permanent

structures. This raises the question over 'meanwhile use' that can be swept away in favour of more profitable housing and retail. It is becoming clear to the local community that without actual ownership of the docks, their visions and plans will never be prioritised. In fact, the danger now is that the artists, who worked so hard to profile the importance of the site, have merely raised the land value, playing into the hands of the developers.

Following a year of community consultation, benchmarking with other European Cities, architectural competitions and artist residencies, a new paradigm for heritage is emerging in Govan that are not simply about preservation or even, restoration of the Docks. In dialogue with the local community, shipbuilders, artists, activists, academics, and wider national and international networks, new proposals from community activists emerged which include an interpretation centre, telling the story of shipbuilding in Glasgow, an engineering hub that encourages a new generation of engineers embracing all the skills required for 21st century shipbuilding, a park and walkway that links with the whole of the developing critical mass of attractions. It is a vision for a tourist destination that incorporates industry; including historic ships, the Riverside Museum, distilleries, and the Finnieston Crane, but also some housing to allow footfall and natural surveillance of the rest of the site. All of this sounds remarkably akin to Geddes' *Folk, Work, and Place*.

3. The artists'lens

For at least a century, there has been an understanding that artists are key to helping us interpret the world in language and discourse. Claire Bishop and Grant Kester have summarised the polarised, more than decade-old debate around different artistic approaches to transforming the hegemonic narrative through interventionist or socially engaged arts practice. Kester [17] explored the role of the artist as activist, describing the artist as a facilitator in a process of empowerment. Bishop [18, 19] regards the artist as the sole author in an engaged process with participants supporting the act of creation. Bishop cites the work of performance artists like Proletkult Theatre and the Situationists as disrupting forces, taking the artist from the gallery space into the public realm. Bishop's examples show more genetic similarity to establishment art simply taken outside of the gallery as a disruptive force. Kester on the other hand, points to specific case studies exemplified for instance by work from the Austrian artist collective, Wochenklausur (an embedded discursive process involving key stakeholders in a given community over a whole week of being closeted from the real world). The origins of the work of Wochenklausur, Kester asserts, can be traced back to the activism of the community arts movement of the 1960s and 1970s, He identifies these approaches as having the ability to challenge social and political norms. The work of Kester and Bishop has both promoted and defined the contemporary debate around interventionism versus participatory arts practice, with polarisation implying there is a right or wrong approach. Where both Bishop and Kester agree is that each acknowledges the role of the artist in the process and each approach as having advantages and limitations.

We argue that there is room for the methods proposed by both Kester and Bishop as well as myriad of other socially engaged practices that engage, empower and transform diverse media and perspectives. Our question moves this debate further to ask: What is missing, the presence of which would allow intervention into the dominant narrative, alternative visioning and community-led alternative plans be taken from vision to realisation on the ground?

In Scotland, the tradition of artistic interventionism was highly influenced by George Wylie in the late 20th century. Inspired by European movements like Guy

Debord and the Situationists his question mark inside the straw locomotive that hung from the redundant, iconic Finniston Crane and the boat made of paper that sailed into the heart of New York's World Trade Centre were designed to ask questions about the reasons for the decline of heavy industry on the River Clyde [20]. With his question mark constantly interrogating who has the right to make decisions about the city [21], another key influence on Wylie was Joseph Beuys whose idea of Gesamtkunstwerk was artistic interventionism designed to influence politics, society and planning. A whole generation of artists (inspired by Wylie and these international movements) was encouraged by, for example David Harding who, with Sam Ainsley, founded Sculpture and Environmental Art at Glasgow School of Art, using Bauhaus methods of the peer exploration and learning. The working practices of Wylie, Harding, Ainsley and others contain elements from the polarised positions adopted by Grant Kester and Claire Bishop.

The journey from the 20th century has involved a melding of interventionism with participatory learning and empowerment and it is these influences starting from the radical but aesthetically aware community arts movement of the 1970s and 1980s that have helped shape Scottish artistic participatory interventionism and activism. Like the positioning from within that fractured the community arts movement of the 1980s, perhaps the debate is unnecessarily polarised and the most powerful approaches in participatory artistic interventionism both borrow from myriad practices and invent new ones.

In the case of Govan's Graving Docks, artists were joined by campaigning activists, local residents, community groups, private and voluntary sector enterprises, representing the existing cultural diversity to commission their own alternative plans for the place. They also engaged 'glocally' or 'inter-locally' with other post-industrial waterfront struggles across Europe. Mathews [22] argued that across the UK decades of regeneration schemes and partnership initiatives have actively mitigated against the organic growth of these passionate struggles.

What remains unclear is the outcome of the process from acknowledged small victories to real impact on physical planning that does not automatically lead to gentrification. As many artists and writers have discovered, there are limitations to artistic interventionism. The artist can facilitate new vision and aspiration but without ownership, power and economic capital, taking the next steps towards implementation are thwarted. We are mindful that in attempting to challenge the dominant agenda, artists can inadvertently be exploited by these same market forces (Sholette, 2010). Artists still have to pay bills, and a key challenge is how to avoid artists being appropriated to serve other agendas. How does the artist avoid 'art-wash' in service of those same market forces? (Pritchard, 2017).

4. Towards arts-lens based solutions

Organic cultural planning often begins with some sort of crisis or intervention [23]; it travels through the process of participation, creative engagement in uncovering and mapping resources, transformation from the inside out, celebrating history and tradition, with iterative community empowerment. Finally, this process supports new legal organisational forms to take ownership, to build their own micro exemplars of alternative future visions that build on what is already there in the landscape, its people and history. The iterative journey often starts with an interventionist approach. As in the case of Govan's A listed heritage site, Govan Graving Docks, artists discovered there is no route map, however. The journey is messy, unpredictable and unique to the location, the people involved and the scale of the task.

Lorraine Leeson [24] for example discovered through years of engagement in regeneration battle over the London Docklands that community-led planning requires different approaches at different stages of the journey towards community empowerment, depending on levels of confidence and capacity of taking ownership and management of the land and its assets. Through artistic activism, Leeson and local people campaigned on issues of dispossession, relocation and gentrification in the Docklands area. Looking at London Docklands today, the question is how much impact those interventions made beyond the activism and arts practice. Was there real impact on the planning in the end? Leeson acknowledges the limitations of the artists working within a complex landscape of owners, developers, local authority and planners; all with competing agendas which are, whilst diverse, all located within market priorities [24]. Leeson's decades of work have left however an invaluable legacy; documentary and celebration of what was there, but the impact on the physical planning and what exists there now is difficult to discern.

How do these utopian visions created by the artists, the arts collective or the artists working with the community translate into the lived experience of change? Kester [17, 25, 26] acknowledges that maintaining revolutionary energy in the long term is impossible. But how about the incremental sustained revolution from the grassroots, a creative social enterprise-based movement?

Collectives like Wochenklausur were criticised for confusing art and social practice. Have they been overstepping the mark by moving from intervention to delivery of the solution? Or are Wochenklausur, like artists and activists through Govan Graving Docks Regeneration Trust, delivering quality in both the intervention and in the subsequent practice which supports the creation of a fit for purpose governance structure that can continue to grow and deliver the solution independently? We argue that the expectation of these artists in the process is not only facilitation and creation of the intervention but finding a solution of how to underpin the process, embracing activists, planners and experts through inclusive governance structures involving local networks and key stakeholders, all working together in order to move from intervention to delivery.

Perhaps, as the narrative that overrides discourse co-created by artists and local people (or indeed from any social, heritage, cultural perspective) is that of the ownership and the economic rights of the owner to make profit. Ownership is simply another narrative with another competing set of priorities, but within the limitations of the 21st century global Capitalism, it appears all powerful and regarded as the common sense narrative. Within the Capitalist economic framework, therefore, ownership is perhaps the only solution. The problem remains, however, that even with ownership, these heritage gems, polished by passionate local people, remain individual examples of 'flowers in the desert' [27] that are vulnerable to passing trends, changes of personnel and competing political agendas.

5. Artist lens solidarity networks

Owen Kelly [2] long time ago now pointed out the need to 'avoid collusion with the organisations providing funding' by organising in financially independent groupings (p.154). He argued for networks; multi-disciplinary networks of independently financed groupings that include cultural activists. Kelly realised the danger inherent in the notion of sanctioned community control where groups are constantly seeking a mandate or an authorisation because they somehow have sufficient numbers of local residents on board and are therefore allowed to speak for the community. It is this pursuit of the ideal activist grouping with the right to speak for the community that has kept Govan's community organisations at war for

decades with endless debates about who has the right approach, who has the right of influence and ownership over whose voice and whose community; leaving the movement off track and weakened.

Gregory Sholette [28] has analysed art collectives, arguing that these are the kind of structures artists need to have in place to ensure strength in numbers and the ability to avoid appropriation by other agendas. Looking to arts collectives across Europe (particularly Germany) he proposes twenty first century collectivism is a 'key to understanding available forms of political resistance'.

One of the earliest international networks of artists experimenting with new forms of cultural interventionism under the umbrella of the community-centred socially engaged arts practice and cultural planning was Banlieues d'Europe [29]. In the late 1980s, with Socialism in crisis throughout Europe, Strasbourg based artist and artistic director of La Laiterie, Jean Hurstel was fascinated by the resilience of artists within the turbulent political landscapes of individual European nation states. The vision was born for a network that would support the activities of artists with shared ethics, provide a platform and forum for a debate, share experiences as well as promote learning with successful projects giving strength and support to those who were struggling to survive.

The aim of the Banlieues d'Europe network was to provide that space where socially engaged artists, arts organisations, academics and stakeholders with like minds could come together to debate and develop practice methodologies. Banlieues d'Europe believed that the individual projects on the ground, often taking place in apparently insignificant ghettos of insignificant neighbourhoods, were vital to creating the critical mass required for a rich, culturally diverse and transformed Europe. Banlieues d'Europe did not initiate projects, instead it facilitated the meetings and exchange of projects which prioritised the quality of the aesthetic and democratic social justice within the different European member states. The Banlieues d'Europe network supported the Scottish artists to make those international links.

If international networks are to continue bringing global perspective with learning and sharing of practice, there is also a need for a sustained local support. Evidence from across Europe today and beyond, however, suggests that artists' collectives are tolerated by the owners of empty buildings just as long as they are useful. They animate and create a buzz by their presence, raise land value, and ruthlessly swept away as soon as the timetable for profitable construction opportunities dictates. Organisational structures must be more robust and sustainable if artists are to avoid becoming the agents of the developers and therefore ultimately letting the communities down that they fought to support.

In Scotland, a local network for social enterprise and social entrepreneurs was created to support social enterprises and their networks. Senscot is perceived as the network of networks, understanding the role of the individual within the group within the collection of groups that form the whole [30]. The network celebrates interdependence between individuals, groups and collections of groups. And it might be this interdependence that can facilitate flourishing futures for the post-industrial milieu.

However, Senscot grapples with the problem of trying to operate as a holistic model within the hegemony of the market economy. Although Senscot has populated the landscape with a support network of holons designed to deliver some aspect of the whole vision, within a market society, it is easy for these seedlings to be taken off track and become parts of the capital growth agenda instead; in other words, become part of the problem. When alternative forms start to mimic Capitalist competition, they become part of the problem. Social enterprises struggling to survive within the market economy are tempted to embrace ideals of

growth and expansion and the debate within the social enterprise movement in 2020, asks which model is preferable. In *Winners Take All*, Anand Giridharadas, as Mark Kramer [31] argued, calls out the hypocrisies of philanthropists asking whether the elites are hi-jacking social change? In a mirroring of cultural appropriation processes, the language of social enterprise is being used to disguise wolves in sheep's clothing with Capitalist growth model aspirations.

In 2020, a new body was established in Scotland, a merger of Senscot, and Social Firms Scotland. This new body, SENscot, hopes to work ever more closely with other organisations and networks in the landscape who share ethics, values and aspirations of building the same utopias, including Development Trust Association for Scotland supporting all the community led organisations in their bids to own and develop land and heritage assets through trading. We argue that as with community arts and cultural planning beforehand, the social enterprise movement is now also fractured, divided between those bottom up advocates of organic growth from the grass roots networks and those who advocate organisational growth and personal gain as the access to power.

6. Community arts centered cultural planning 2.0

Over the last six years, there is a growing debate over Industrial City 2.0 with striking similarities to Geddes' *Folk, Work and Place*, based on ideas of 'coexistence, proximity, and synergy'. For instance, Nawratek's vision for Industrial City 2.0 seems to echo Geddesean *Folk, Work, Place* descriptions of the synergy and proximity where the city can once again develop with all the elements of life included: the living, retail, tourism, heritage, learning and industry working together [32]. Is the Fourth Industrial Revolution based on amalgamation of digital, physical and biological systems into planning an answer to a new paradigm for heritage? Such planning requires a careful balancing between maximising profits with maximising well-being and dignity of life.

In a seminal text originally written for the Sustainable Development Commission in 2009, Tim Jackson revisited his publication *Prosperity without Growth*. Jackson redefined the meaning of prosperity, removing material wealth and economic growth as priorities in the definition, replacing them with what he calls 'the economy of tomorrow', evidenced factors that contribute to social, community and individual wellbeing. Work is redefined as participation and contribution; money conceptualised as social good [33]. What Jackson is describing are the values defined by the emerging social economy around the world, evidenced in Scotland through initiatives such as Senscot and Social Enterprise Networks. With recognition that between 2009 and 2017, these ideas, embracing sustainable employment, social investment, equality, ecological and financial stability are no longer seen as utopian, but have moved from fringes to mainstream, the question then becomes, how do we ensure their delivery? If the possibilities of a Fourth Industrial Revolution that values our history and heritage as well as social and economic priorities are utopian aspirations for which we must continue to strive, what can be the road to achieving it? Fractured between top down or bottom up positions in the 2000s, understanding of the potential of cultural planning lost impetus and direction. It also lost clarity of distinction, confused with the culture-led regeneration, planning for culture and strategic arts development.

A new approach to cultural planning, a kind of Cultural Planning 2.0 that is not about arts and cultural development or services, although it does involve artists engaging with communities and their heritage, is neither solely top down nor bottom up but rather, is more inclusive of all parties working in partnership could offer

some possibilities as a route map. Just as there may be a place for a refreshed cultural planning solution to delivering the transformation possibilities of the Fourth Industrial Revolution, so there are possibilities in a new approach in artistic interventionism that engages and galvanises communities, cities and governments as a network to deliver on the aspirations of communities and their heritage priorities. In short, to achieve this Geddesian aspiration, we could aspire to Cultural Planning 2.0, which acknowledges cultural planning is neither top down, nor is it bottom up but rather inside out and required the partnership grown from a shared value base that aspires as inclusive as possible.

7. Conclusions

Reflections from the regeneration process concerning Govan's Graving Docks indicate that far from post-industrial, we are in fact poised on the cusp of a new epistemic era. There is an emerging new approach to industry, which moves beyond what we know to an industry fit for purpose in allowing delivering the what could be the Fourth Industrial Revolution. Govan's Graving Docks, as other industrial heritage infrastructure on the River Clyde could be an exemplar in practice of that new potential; an example of practice, based on an organic city development, embracing Geddesian principles of *Folk, Work and Place* while incorporating new technology, learning, heritage, tourism, housing and recreation in a heritage-centred and culturally sensitive holistic framework.

Artists' collectives and activists, working together can achieve community engagement and co-created visioning while in parallel lobby voice to intervene in the default direction and propose an alternative. On their own, however, they are vulnerable to being swept away when no longer 'useful' risking their work being repurposed to serve the central planning agenda. There is also a requirement for a new business model for delivery which advocates cross-sectoral but prioritising community aspirations, a model that achieves the balance of power, ownership and control.

We conclude that despite new directions, the successful transformation of narrative remains fragile. Artists have the skills to transform the network of conversations, but in parallel, there is a need for partnerships and appropriate governance structures that gives sustainable community power to move beyond the intervention into a delivery of the visions in planning terms. The question of ownership is crucial. Artists are skilled at engaging communities in participatory visioning towards utopian realities. Yet, if the created visions are to be adhered to then iterative creative mapping must underpin not only visioning phases, but every step of the way from inception to delivery. The possible way to ensure this happens is through community ownership of the assets.

A new paradigm is currently being developed for the heritage asset of Govan's A-listed Graving Docks redevelopment. Govan Docks Regeneration Trust has formed as an independent community development trust with the board of trustees based on networks with the private, public, social enterprise, community and voluntary sectors as well as artists and local residents. There are examples in Scotland from the Easterhouse Festival Society in the 1970s and 1980s to Govanhill Baths Trust in Glasgow where Development Trusts governed by community representatives and led by artists are operating as social enterprises. They have bought their land or buildings and are expanding their vision and operations. These business models, initiated in the 1960s and revisited in the 21st century as community development trusts, are operating within networks of like-minded communities. They have much to offer, giving structure and stability to the messy creativity and community responsiveness.

And Finally

As discussed in this chapter, cultural planning processes are messy by nature and there is no toolkit or route map that can be rolled out and replicated. Meller [34] some time ago criticised the vagueness in the Geddes' legacy and it remains unclear how to translate that knowledge and passion into reality within a top down planning framework so that local people and heritage assets, including tangible infrastructure and intangible histories can reliably have power and voice in the planning process. We argue that, rather than imposing a toolkit, there is a need for better articulation of these messy unpredictable processes. And perhaps, the messiness is exactly the crunch point here. There are ingredients, there are underpinning values, but no toolkit because each situation is, of necessity, unpredictable and requires responsiveness to the heritage, the creativity, the people (and their imagination). In other words, the unique DNA and local circumstances of each place are all part of the plan. In fact, they *are* the plan: to be unveiled.

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Chapter 19

The Implementation of Sustainable Development and Protection of Cultural Heritage at Different Levels of Spatial and Urban Planning: A Case Study of the Republic of Serbia

Nebojša Stefanović and Nataša Danilović Hristić

Abstract

The starting point in this paper is the position that spatial and urban planning has a key role in sustainable development and the protection of cultural heritage. The planning method used in areas of cultural heritage differs depending on the type and level of the spatial plan. It is possible to identify aspects of protection and sustainable development in plans, with the protection of cultural heritage dominating in practice. Research was carried out on a case study of three spatial plans at different levels, which both in terms of their methodology and content make up the planning system for the protection and sustainable development of cultural heritage in Serbia. The comparative analysis of the plans includes three aspects: protection, the sustainable development of cultural heritage, and the integration of cultural heritage into the planning and protection of landscapes. The implementation models of the spatial plans were considered. The main conclusion of the paper is that the concept of protecting cultural heritage has not evolved into a system of comprehensive and adequate planning for its sustainable development, nor is it sufficiently integrated with the planning and protection of landscapes. The paper provides guidelines for improving both the methodology of spatial planning and the concept of the sustainable development and protection of cultural heritage in spatial plans.

Keywords: Cultural heritage, spatial plan, protection, sustainable development, landscape, implementation

1. Introduction

Replace the entirety of this text with the introduction to your chapter. The introduction section should provide a context for your manuscript and should be numbered as first heading. When preparing the introduction, please bear in mind that some readers will not be experts in your field of research.

Cultural heritage is situated in both natural and semi-natural environments, as well as in highly urban environments, where various activities can accelerate the transformation of the area and have a negative impact on the quality and use of the cultural heritage. Therefore, spatial development policy is crucial in protecting, managing and increasing the value of such areas, primarily through the adoption and implementation of appropriate planning solutions and measures. In addition, the interaction between different sectoral policies and the coordination of their territorial impacts is important.

These generally accepted positions point to the key role of spatial and urban planning in the sustainable development and protection of cultural heritage. With these starting points, the authors use spatial plans as the research subject in this paper, analyzing the methodology of their development and content. The hypothetical assumptions of this research are that the method of planning in an area of cultural heritage differs depending on the type and level of the spatial plan. Furthermore, it is possible to identify aspects of protection and sustainable development in the plans, with the protection of cultural assets clearly dominating in planning practice. Finally, the hypothetical assumptions are concluded with the authors' views that the protection and the development of cultural heritage are not integrated with landscape planning, and that the aspect of implementation is insufficiently addressed in plans.

One of the basic principles of sustainable spatial development is the principle of increasing cultural heritage stock as a development factor [1, 2], which includes increasing the value of cultural heritage. This is one of the most significant contributions to economic development and the strengthening of regional identity, achieved by means of increasing the attractiveness of sites for investors, tourists and the public. Spatial development policy should contribute to the integrated management of cultural heritage, based on the idea of the development process of protection and conservation, while respecting the needs of modern society. Many countries in Europe have monuments that follow the traces of different schools of art and artistic movements, which requires the development of a common approach in conservation, restoration and use, initiating programs of "great cultural routes". In many countries, there are types of cultural heritage that, due to historical changes, events and changes in borders, do not belong to only one but to a larger number of nations, language communities and religious groups, some of which no longer live in those regions. Spatial development policy must preserve and respect the memories of each nationality, language community and religious group, which have created a specific type of cultural heritage.

International documents adopted in the last decade [3] which refer to the protection, planning and management of cultural heritage emphasize a contextual approach that considers the expansion of the object of protection, from individual monuments to wider spatial units. They underline the need for integrating conservation, management and planning strategies for historic urban areas with development and planning documents. In addition, the concept of protecting areas of cultural heritage and their surroundings is closely connected to the issues of planning and protecting landscapes, with special significance given to the integration of landscape development into spatial planning and other sectoral policies, as well as the implementation of integrated policies aimed at the protection, management and planning of areas of cultural heritage.

Based on the above, it seems that the current procedures for protection and planning with regard to cultural heritage can and must be improved, particularly concerning the development aspects of protection, implementation, coordination with other sectoral policies and others. The analysis of previous experiences and the possibility of improving the process of spatial planning in the field of cultural heritage are the main goals of this paper.

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2. Literature review

Consulting the most recent scientific literature, i.e., papers published in the last five years, the authors consider that the greatest preoccupation is on themes related to planning within protected natural areas, while studies covering the relationship between planning actions and restrictions related to the protection of cultural and historical heritage are scarce. On the other hand, it is clear that this topic is by no means exhausted and requires further analysis, especially from the aspect of developing sustainable tourism and strategies for actively protecting and promoting valuable monuments.

Some studies concentrate on the topic of the cultural landscape as the broadest concept: "Cultural landscapes are poorly inventoried and evaluated in protected natural areas. But there is a novel procedure to assess cultural landscape features and their cultural values in the major protected areas. After identifying a set of culturally modified land cover types and habitat types the GIS-based survey, with a set of 12 cultural attributes (involving cultural heritage values, traditional land uses and aesthetic quality) indicators were scored to assess these "cultural values" in each site. Gradient maps were produced to express an initial nation-wide site ranking profile. Heatmaps help link instead of solely rank culturally valuable sites that are in proximity to each other, showcasing site clusters of outstanding value. These analyses help define the level of "culturalness" of each site based on human-modified landscape and habitat types and provide a baseline review of cultural values in protected natural areas. This screening-level survey identifies the protected areas that may require special attention for managing cultural elements-of-diversity" [4].

Other authors focus on the use of modern GIS technologies for displaying locations and their overlapping areas of interest and restrictions, as well as for tracking the number of visits: "New technologies are used in mapping not only of heritage locations but also about visitation and expressed interest" [5]. Massiveness certainly brings profit, but it reduces the quality of the experience, so it is necessary to change the concept and approach: "Visitor management planning is a new concept, tool and strategy of sustainable tourism and ecotourism. The importance of this concept is in the new approach to tourism in natural and heritage protected areas of the country, which means implementing a completely different philosophy of tourism" [6].

It is the number of visits that has become a key factor for some locations, because the excessive crowds resulting from the huge interest of tourists, so-called "overtourism", causes negative effects, and instead of contributing to the presentation and sustainability of valuable monuments, it leads to its degradation [7]. The authors cite a number of examples and offer recommendations for overcoming such situations. One of the causes of excessive tourism can be cruising destinations, if the distribution of visitors is not properly dosed. On the other hand, tours on the Danube Corridor can be seen as having great potential as an opportunity, which has contributed to the strategic planning of 9 new locations for passenger ports, in addition to the existing 5, primarily in the immediate vicinity of cultural and historical sites: "In the Podunavlje area in Serbia, significant attractions are located in vibrant urban centers such as Belgrade and Novi Sad, with seven fortresses from north to east downstream, including Bač, Petrovaradin, Beograd, Smederevo, Ram, Golubac, and Kladovo (Fetislam). There are also 21 archeological sites, the most significant of which are the Vinča and Lepenski Vir sites from prehistoric times, along with the city of Viminacium, Emperor Trajan's road, bridge and stone board with inscriptions from the Roman period. Apart from these landmarks, two national parks (Fruška Gora and Đerdap), several other parks, special nature reserves, nature monuments, and areas with significant characteristics are situated in the surrounding areas and are protected areas" [8].

Participation of the public and stakeholders in the planning process itself, and the harmonization of the needs of contemporary life and development of tourism with the limitations arising from protection regimes are also significant issues: "Most studies on community participation in tourism planning only advocate the importance of the concept and/or identify barriers without articulating the required actions or strategies to actually promote community participation. Six strategies emerged as major prerequisites to achieve full and active community participation in tourism planning associated with protected areas are: public awareness and education; capacity building; creation of linkages; use of appropriate participation methods; involvement of appropriate local community organisations and decentralisation and coordination of relevant management organisations" [9]. Proper implementation of the participation procedure and transparency of the planning process are the guarantee of quality implementations of plans in the future [10–14]. The general conclusion is that some global topics, as well as practical experience, can be used with certain adjustments to the situation and systemic frameworks in the Republic of Serbia.

3. System of sustainable development and protection of cultural heritage in the Republic of Serbia

The basic framework for the protection and sustainable development of cultural heritage in the Republic of Serbia is determined by the Law on Cultural Property [15] and the Law on Planning and Construction [16]. In accordance with the Law on Cultural Property, cultural heritage is made up of objects and creations of material and spiritual culture of general interest, which are under appropriate protection. They are divided into movable and immovable cultural heritage. Depending on the physical, artistic, cultural and historical characteristics, immovable cultural heritage is: cultural monuments (buildings/architectural objects or units), whole cultural and historical spatial units (part of an urban or rural settlement in which there are multiple cultural assets), archeological sites and landmarks (space related to an event or person of significance in history).

According to their significance, they can be: uncategorized cultural heritage, cultural heritage of great importance and cultural heritage of exceptional importance. Cultural heritage of exceptional importance has one of the following characteristics: special significance for the social, historical and cultural development of the people; it testifies to crucial historical events and personalities; it presents unique examples of the creativity of its time; it has a great influence on the development of society, culture, technology and science; or it has exceptional artistic and esthetic value. Cultural heritage of great importance has one of the following characteristics: it is significant for a certain area or period; it testifies to the phenomena or conditions of social, cultural and historical development; it testifies to significant events and prominent figures in history.

When an architectural object is declared as immovable cultural heritage, its protected environment is determined, which has the same protection status as the object itself.

These elements indicate the dominant aspect of protecting cultural heritage. However, the issue of their sustainable development (presentation, use), spatial aspects and integration with other activities and functions in space are determined by the Law on Planning and Construction. As basic principles in the arrangement and use of space, the law defines the protection and sustainable use of immovable cultural heritage, and the preservation of customs and traditions, as well as the specifics of the landscape.

The system of planning documents consists of the spatial plan of the Republic of Serbia, regional spatial plans and spatial plans for special purpose areas adopted at the national or regional level, as well as the spatial plans of local self-government units and urban plans adopted at the local level. Each of the listed plans in the hierarchy must be harmonized with the higher order plan (wider area).

The spatial plan of the Republic of Serbia is the basic planning document for spatial development, which has a strategic development function, and contains measures for the protection, arrangement and improvement of cultural heritage (scale of graphic attachments 1: 300,000). Regional spatial plans are prepared for larger spatial units of an administrative character and are focused on regional development goals and projects (scale of graphic attachments 1: 50,000). Spatial plans for special purpose areas are prepared for areas of national interest that require a special regime of organization, arrangement, use and protection of space, and especially for areas of cultural and historical units and environmental value. Their specificity is that they can contain all the detailed elements of urban plans (different sizes, up to 1: 1,000) and that they are directly implemented by applying the rules of arrangement and construction, with the possibility of resolving property relations if necessary.

Bearing in mind the basic elements of this system, the authors conducted research on a case study of three spatial plans which in terms of their methodology and content make up the planning system of protection and sustainable development of cultural heritage in Serbia.

Further, the paper presents only some of the key elements that indicate the aspect of protecting immovable cultural heritage and its surroundings in plans, while the analysis included the entire spatial plans and the documentation on which their development was based.

4. Analysis of the sustainable development and protection of the cultural heritage in spatial plans

4.1 Spatial plan of the Republic of Serbia from 2021 to 2035

The Spatial Plan of the Republic of Serbia from 2021 to 2035 [17] concerns the entire territory of Serbia, which covers 88,488 km^2. As one of the important aspects of spatial development, it deals with cultural heritage. According to the available information of the Institute for the Protection of Cultural Monuments from 2020 [18], it consists of a total of 2592 immovable cultural assets of various types and significance (**Table 1**, **Figure 1**).

In addition to these, there are 12 sites (or 6 entries) under UNESCO protection in Serbia: Stari Ras medieval complex of monuments and Sopoćani Monastery, 4 medieval monasteries of the Serbian Orthodox Church in Kosovo and Metohija (Visoki Dečani, Patriarchate of Peć, Bogorodica Ljeviška, Gračanica), the remains of the Felix Romuliana Palace (Gamzigrad) and three sites of medieval tombstones known as the Stećak tombstones. In addition, 11 more sites have been suggested for entry: 1 monastery, 3 national parks and 1 nature reserve, 1 archeological site, 1 historical location, 1 settlement, 1 fortress, 1 rare natural phenomenon, and one cultural belt (the Danubian Limes).

The general aim of spatial development in the field of the protection, arrangement and use of cultural heritage is the affirmation of cultural heritage as a valuable resource for sustainable development and as a factor of national and regional, urban and rural identity. Some of its specific objectives are the

Importante Cultural assets	Exceptional importante	Great importante	Untategorized tultural assets	Total
Cultural monument	155	512	1566	2233
Spatial cultural/historieal unit	11	28	47	86
Arclieological site	18	25	151	194
Landmark	16	17	46	79
Total	200	582	1810	2592

Table 1.
Immovable cultural assets in Serbia by type and category in 2020.

development of an integrative and territorial approach to the protection, arrangement and sustainable use of cultural heritage as well as the introduction of a typological approach, and the characterization of space at the level of areas, settlements and smaller units.

This spatial plan treats cultural heritage as an inseparable part of the living environment (natural and created), seeing it in correlation with its immediate environment and the way it fits into the functions that meet the needs of modern users. The following are recommended: applying the concept of protection in urban planning, introducing contextual analysis and valorizing building stock, and the spatial audits of individual locations. In order to preserve the identity of urban and rural settlements in Serbia, it is necessary to protect, present and affirm the material remains and influences of various civilizations that inhabited the Balkan Peninsula (Roman, Byzantine, Ottoman and modern European civilizations, including the socialist period).

Bearing in mind that this is a national planning document that is indirectly implemented through other spatial plans, this plan defines a set of guidelines for the lower levels of planning.

Guidelines for cultural monuments - chronological and topographic gaps should be a priority in the valorization and revalorization of cultural monuments which, perhaps more than other immovable cultural heritage, provide a cross-section of complex civilizational trends in the area. Their preservation, study, restoration and popularization will be performed in a coordinated and integrated manner through the process of spatial and sectoral planning (in tourism, the protection of cultural monuments, etc.).

Guidelines for spatial cultural/historical units - when determining spatial cultural/historical units and their treatment in planning documents, it is necessary to respect the criteria of scientific assessments with regard to the artistic, cultural, historical and other values of the immovable cultural heritage that belong to the unit. Alongside the protection, arrangement and sustainable use of cultural heritage, it is necessary to include categories in accordance with international recommendations and standards [19, 20], such as: historic buildings and ensembles; urban and rural settlements/historic towns and villages; agricultural, industrial and technological properties; military properties; cultural landscapes, parks and gardens; cultural routes; burial monuments and sites; modern heritage, etc.

Within the current planning procedures, it is necessary to valorize the wider environment of cultural heritage in order to determine the space that is relevant for experiencing and presenting it. In that sense, it is necessary to protect the appearance, scenery, spatial configuration of the entire area, landscape and units that belong to the protection zones. Cultural heritage can be spatially connected by defining cultural areas and cultural routes at the international, national, regional and local levels.

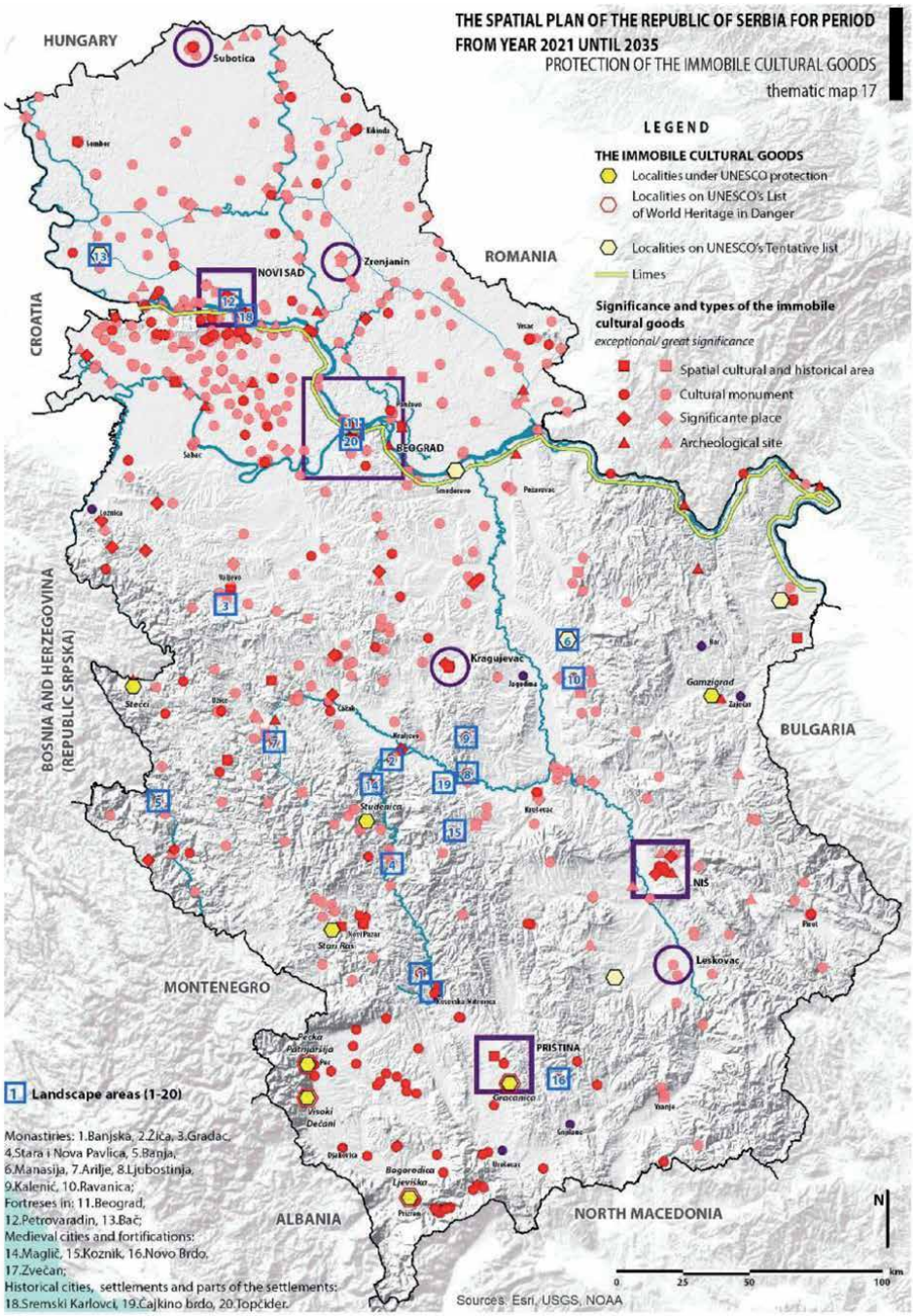

Figure 1.
Thematic map of the protection of immovable cultural heritage in the spatial plan of the Republic of Serbia from 2021 to 2035. Source: Spatial plan of the republic of Serbia from 2021 to 2035 – Draft, Ministry of Construction, transport and infrastructure, April 2021.

Guidelines for archeological sites - indicate an approach to site protection which must be adapted to the site's specific characteristics. For sites in areas that are not developed, there is an option of implementing protection by preparing a planning document. No construction or buried infrastructure can be planned in these areas. Preventive archeological research is also recommended as part of the planning

process in response to proposed development solutions that could jeopardize archeological resources. Preventive archeological research should also be carried out in order to identify and record elements of archeological heritage that would be abandoned and/or destroyed as a result of development, especially when it comes to the construction of dams, roads, railways and other similar structures.

Guidelines for landmarks - it is necessary to conduct a revalorization of both already identified landmarks and landmarks whose memorial and historical value is dominant. As traces of historical events, all immovable cultural heritage of this kind should be treated equally.

The concept of the protection, arrangement and sustainable use of landscapes can be added to the mentioned elements in the planned treatment of immovable cultural heritage. One of the key elements in this is the protection and sustainable use of natural resources, natural and cultural assets, and their connection in space (local, regional, national ecological and cultural networks).

Depending on the degree and type of modification, the dominant processes that control a given space, and the character of human influence on the landscape, the territory of Serbia is classified into natural and cultural landscapes.

Cultural landscapes are divided into rural and urban landscapes, depending on the character of the modification of the landscape structure, the predominant manner of land use, the network, the type of settlement and the population density. *Rural landscapes*, in a structural sense, show natural characteristics that are close to the landscape. They have a lower population density and extensive land use, and rural settlements are an organic part of the natural environment. *Urban landscapes* are completely modified natural or rural landscape that are formed and function in relation to the needs of the urban way of life. They are zones of urban development (metropolitan areas, agglomerations, urban centers of the development axis).

Cultural landscapes may belong to the following categories: (1) designed cultural landscapes; (2) organic and relict cultural landscapes; and (3) associative cultural landscapes that possess esthetic, symbolic and spiritual value for the human community.

The spatial plan further defines guidelines for achieving the target quality of rural and urban areas. In *rural areas*, sustainable development is based on recognizing, protecting and improving their specific character, existing value and landscape capacities. In the development of spatial and urban plans, it is necessary to ensure: the preservation of the landscape pattern based on the specific composition and configuration, land use, the ratio of built and open space, regulation of construction and landscaping in accordance with tradition; an appropriate purpose of space and protection of the local identity; the integral protection of cultural and natural heritage and their adequate presentation for tourism, taking protection regimes into account; the affirmation and creation of the architectural identity of a settlement, based on the preservation and revitalization of traditional architecture, as well as on new construction that increases attractiveness; the formation of an ethno settlement as a museum of rural vernacular architecture, which is typical for the character of the landscape and its use for tourist purposes; prescribing morphological, ecological and landscape-shaping rules of arrangement and rules of construction.

The development of *urban landscapes* is based on the fact that these will continue to be the landscapes with the greatest dynamic of change. In the development of spatial and urban plans, it is necessary to provide: regulated construction and spatial planning in accordance with the target quality and character of the landscape, the specifics of the development of the urban landscape as a whole and development of individual settlements; directed expansion of urban settlements and planned construction in accordance with the demands of preserving cultural and natural heritage, the rational use of urban construction land and giving priority

to urban renewal, recycling and construction within the already existing urban matrix; the preservation of open spaces and elements of nature in urban centers, the activation of abandoned and devastated spaces and the formation of a network of public spaces that connect natural and cultural assets.

4.2 Regional spatial plan of the Kolubara and Mačva administrative districts

The Regional Spatial Plan of the Kolubara and Mačva Administrative Districts [21] covers an area of 5,746 km^2, i.e. an area of 14 local government units. One of its basic aims is to define the protection, preservation and presentation of cultural assets, in order for them to be included in the tourist offer and to establish a regional and local cultural identity.

In the area of the spatial plan a total of 219 immovable cultural assets are protected, of which 7 are of exceptional importance, 20 of great importance and 192 are uncategorized (of which there are 190 cultural monuments, 6 spatial cultural/historical units, 16 archeological sites and 7 landmarks).

Its main aim is elaborated through a number of specific objectives, such as: establishing integrative protection and cultural property management; undertaking urgent action to conserve, restore and revitalize the most valuable and most endangered heritage; determining and arranging the protected environment surrounding the immovable cultural heritage; integrating the protection and presentation of cultural assets in the development of the tourist offer of an area (transit and touring of cultural routes).

The basic planning commitment is the adequate protection of cultural heritage, which includes taking general measures. For *archeological sites* - categorizing the most valuable sites; more efficiently protecting cave archeological sites within the integral protection of natural areas of river canyons; infrastructural equipping and arranging the space covered by archeological sites; establishing archeological parks for individual sites; and determining the zones of archeological sites of regional significance.

For *cultural monuments* - complete technical protection, along with the renovation of individual buildings; preserving the basic properties and constructive, stylistic and typological characteristics, especially of buildings of sacral and technical architecture; presenting cultural monuments without disturbing their cultural and historical properties; recording and valorizing immovable cultural heritage, with priority given to valorizing vernacular buildings, commercial buildings, technical culture buildings and newer urban architecture; recording, valorizing and determining cultural monuments dedicated to the liberation wars of the Republic of Serbia, primarily during World War I; bringing sacral cultural monuments to an exclusively sacral purpose and liturgical needs; etc.

For *spatial cultural/historical units* - revalorizing and determining the categorization of individual units, as well as re-examining the validity of the boundaries of the wider protection zone for the old bazaar (City of Valjevo); implementing measures for the technical protection of a whole village (Bebića Luka), remediating and reconstructing buildings of vernacular architecture, with the introduction of modern construction and architectural elements that do not violate the integrity and authenticity of the buildings or the whole unit; defining the degree of reconstructive and remedial interventions and conservation conditions for the technical protection and presentation of buildings within individual cultural and historical units; defining restricted traffic zones and pedestrian zones in urban areas; etc.

For *landmarks* - intensive and systematic research and documenting of landmarks, memorials, cemeteries and tombstones; identifying commercial users; stimulating the construction of a complex within the area of a landmark to which

endangered objects of vernacular architecture would be transferred; removing unplanned objects in the wider protection zone of the landmark; etc.

In addition, the basic planning commitment is to adequately present and affirm the immovable cultural assets as generators of tourism and overall development. The plan singles out particular heritage and areas that should enjoy special treatment, regardless of their current status of protection. This refers to the characteristic objects and traditions that are part of the architectural heritage - vernacular architecture (design elements, building materials, method of use), traditions and the intangible associations connected with them.

A special role in the integration of a comprehensive tourist offer is played by the possibility of forming "cultural routes" which will present immovable and intangible cultural heritage, and make connections with other types of tourist offers. Two cultural trails of international importance are planned, one through the towns of Sabac and Loznica and the other which partly follows the course of the Drina River. In addition, the plan identifies potential cultural routes of national, interregional, regional and local significance, such as the routes insurgents took during the First and Second Serbian Uprising, routes of battles and victims during the First World War, rural life through time, old mining routes and more.

This plan does not define more detailed measures, rules of arrangement or construction in the vicinity of cultural heritage, neither does it define any significant elements regarding the implementation of these solutions.

4.3 Spatial plan for the special purpose area of the landscape of outstanding features: Ovčar-Kablar Gorge

This spatial plan [22] covers a total area of 97.5 km^2, i.e., the Ovčar-Kablar Gorge landscape of outstanding features (protected natural heritage) and the Ovčar-Kablar Monasteries (22.8 km^2 of protected area, 74.7 km^2 of unprotected area).

Unlike the previously analyzed plans, which were prepared for administratively determined areas and in which the protection and development of cultural heritage is only one of many aspects, the following are the specific focus of this spatial plan:

The Ovčar-Kablar Gorge landscape of outstanding features, protected as a natural asset, with a level III protection regime on an area of about 1,700 ha and a level II protection regime on about 550 ha within six separate spatial units;

The buildings and surroundings of the cultural monuments of great importance (monasteries) and other cultural/historical heritage within the unit of the Ovčar-Kablar Monasteries (future spatial cultural/historical units);

Spaces with the purpose of: (1) tourism, recreation and sports, especially paragliding on Ovčar Mountain; (2) integral presentations of the most attractive areas, especially the Zagrađe meander zone of the West Morava River, which is considered to be a center of cultural, natural and tourist potential.

In the area of the spatial plan, in the Ovčar-Kablar Gorge, there are 11 shrines (nine active monasteries), which is why it is often called the Serbian Mount Athos. Four monasteries have the status of established cultural monuments, which are categorized as immovable cultural heritage of great importance.

It is envisaged that the sustainable development of the special purpose areas will be based on the protection, improvement and use of natural and cultural heritage, the development of tourism, sports and recreation and the functional integration of the protected area and the wider environment.

This ensures the permanent and integrated protection of the buildings and surroundings of cultural monuments and other cultural and historical heritage, as well as their traffic and infrastructural arrangement and equipment, the creation of

other spatial conditions for their presentation to the public, and the development of religious tourism.

The spatial plan analytically determines the space for declaring the future spatial, cultural and historical unit of Ovčar-Kablar Monasteries as immovable cultural heritage. It establishes measures of protection within three regimes that are spatially identified as: level I protection regime (strict protection) – courtyard of the cultural monument, with a total area of about 1.12 ha; level II protection regime (ambiental protection) – the courtyard and surroundings of the other monasteries, with a total area about 66.66 ha; level III protection regime (general protection) - the remainder of the Ovčar-Kablar Monasteries unit, with an area of about 2,211.22 ha.

The main measures in the level I protection regime are: banning the construction of facilities, except for the reconstruction, extension and maintenance of monastic housing and auxiliary facilities, technical protection, restoration and maintenance of church buildings, and the reconstruction and maintenance of energy and communal infrastructure; prohibiting other works, except for the appropriate landscape and horticultural arrangement, and protection from the harmful effects of water and landslides; controlled visits to church festivals and cultural events.

The main measures of the level II protection regime are: banning the construction of facilities, except for monastic farm facilities; the reconstruction and maintenance of traffic, energy and communal infrastructure; maintaining weekend facilities; the prohibition of works, except for agriculture, forestry, landscaping and protection from the harmful effects of water and landslides; conducting archeological, natural and other research; arranging and maintaining hiking and other walking trails; banning activities, except for church festivals, cultural events, controlled tourist visitor movement, hiking and cycling, limited and controlled motor vehicle traffic, etc.

The main measures of the level III protection regime are largely in line with the measures established for the level III protection regime for natural heritage, which include: banning the construction of facilities that may cause damage or destroy the material contents of the cultural heritage or may have adverse effects on the landscape features; banning the opening of quarries and the exploitation of mineral resources other than thermal waters and banning or restricting the use of other natural resources.

Archeological sites and buildings of vernacular architecture are an important segment of cultural heritage, and their properties, chronology and significance can be judged with certainty only on the basis of systematic archeological research or the appropriate research of their architecture and construction, as well as their cultural and historical features. For these reasons, detailed and systematic research of the overall cultural heritage of the protected area is recommended.

The cultural and religious tourism zone is formed by all of the monastery complexes with level I and II protection regimes, including the access roads, and the hiking, and bicycle paths that connect them. In the cultural and religious tourism zone, the reconstruction and equipping of the existing parking lots and construction of new ones on the access roads is planned, as well as equipping the local, forest and field roads with signs. For monasteries along the river, providing access from the water area should be considered, which can be done by setting up a pier for adequate vessels.

In the area of the monastery, which is covered by a detailed planning elaboration (**Figure 2**), the basic purpose of the space is religious buildings and complexes. This primary purpose also includes the detailed purposes of the *courtyard* and the *monastery farm*. Within the detailed purpose of the *courtyard*, there are temples, bell towers and monastery residences - residential buildings with accompanying auxiliary buildings. The detailed purpose of the *monastery*

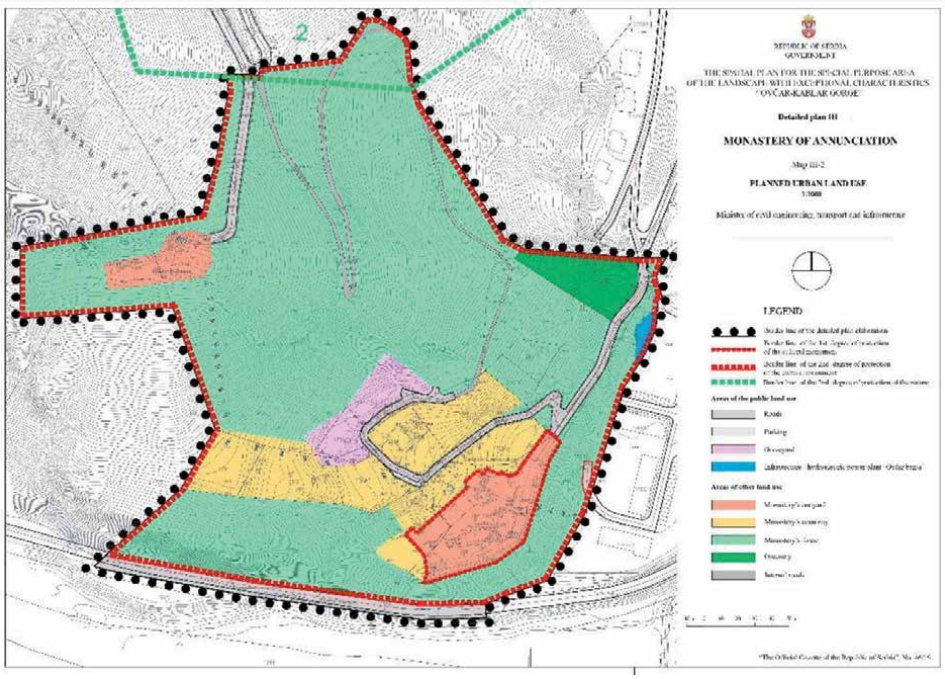

Figure 2.
Map of the detailed planning of the Blagoveštenje monastery. Source: Regulation on determining the spatial plan for the special purpose area of Ovčar-Kablar Gorge landscape of exceptional features (official gazette, No. 46/19).

farm covers economic and agricultural buildings and areas of the monastery. The immediate surroundings of the monastery largely consist of monastery forests, in which no construction is allowed.

Having these protection regimes in mind, the plan gives more detailed rules of arrangement and construction, which mostly refer to roads and infrastructure systems, while all further rules relating to cultural monuments are determined through conditions set by the competent protection institute.

5. Discussion on the implementation of sustainable development and protection for the cultural heritage in spatial plans

In order to consider the issues of implementing the sustainable development and protection of cultural assets in the spatial plans analyzed, the authors use and build on previous research on the implementation model for spatial plans [11, 12, 23], as follows:

- The theoretical definition that the model of implementation of a spatial plan is a simplified representation of a set of related planning decisions on actions in the future, which reflects logical, functional and time coherent planning action, depending on the type and methods of planning;

- The model of implementation has its own elements, which are determined by a set of planning actions in the broadest possible sense, starting from general decisions, through relatively firm target propositions, to very definite statements in terms of content, time and space. The elements of the model go beyond the plan itself as a document (phase of the planning process), and in

addition to the mentioned planning elements, they also include "postplanning elements" defined by the plan (carried out later) and all the necessary elements of monitoring;

- Depending on the type and method of planning, several types of spatial plan implementation models have been singled out, and the implementation model of spatial protection has been analyzed and applied in practice for the purpose of spatial protection.

According to the authors, the research presented in this paper has a special significance, because it refers to the issues of sustainable development and protection of cultural property that have not been subject to such analyses so far. Previous analyses of the implementation model have included protected areas of natural resources and water sources, but not protected areas of cultural heritage.

Furthermore, in their analysis, the authors thematically separate and analyze three aspects (**Table 2**), namely: (1) the protection of cultural heritage and its environment in a narrower sense (P); (2) the development of cultural heritage, i.e. primarily those elements related to the rules of their arrangement, presentation and inclusion in tourist activities (D); and (3) integrating the protection and development of cultural assets into landscape planning and protection (L).

The Spatial Plan of the Republic of Serbia has applied the largest number of elements of the implementation model, those relating both to protection and to developing cultural heritage and landscape planning (a total of 27 elements). The specificity this plan is the large number of recognized elements relating to landscapes from all three plans, as well as the definition of the monitoring elements that are missing in other plans. Therefore, it can be concluded that a general approach has been applied in this plan, which is justified having in mind that it belongs to the national level of planning.

In *The Regional Spatial Plan for the area of Kolubara and Mačva administrative districts*, the fewest elements of the implementation model were applied (a total of 17 elements). The specificity of this plan is that it does not integrate the protection and development of cultural heritage in the planning and protection of landscapes, that is, there is a complete lack of any elements related to the theme of landscapes. Elements of the protection and development of cultural heritage are equally applied in this plan. Since this type of plan is focused on the goals and projects of regional development, i.e. the regional approach to planning, further elaboration on all missing elements is possible and necessary through the local level of planning.

In The Spatial Plan for the Special Purpose Area of the Landscape of Outstanding Features Ovčar-Kablar Gorge, a combination of the implementation elements of all three aspects (a total of 21 elements) was applied. However, the fewest elements are related to the integration of cultural heritage in landscape planning and protection, and they refer only to the general strategic framework, general goals, and planning and program measures for implementation, indicating that these were not sufficiently considered. Elements that relate to the protection and development of cultural goods are relatively evenly distributed. This kind of approach to planning can be characterized as special (as indicated by the name and subject of the plan) and is determined by the need to protect and plan the development of both the protected natural area and the future protected area of cultural monuments.

After analyzing all three plans, the basic conclusion is that general planning elements (strategic framework, goals, planning solutions) are dominant, that there are fewer post-planning elements (dynamics, implementation measures), and that there is a marked lack of elements related to the implementation of monitoring. Further analysis in this direction is not necessary, as it would be largely focused on

	Spatial Plans	I Planning elements				II Post-planning elements							III Monitoring eL		
		Strategic framework	General goals	Specific goals	Planning solutions	Dynamic framework		Measures and instruments				Participants (subjects)	Monitoring system	Evaluation (indicators)	Institutional and organzational aspects
						Priority planning solutions (4 years)	Medium-term and long-term stages	Planning-programming	Organizational	Normative-legal	Financial				
1.	Spatial Plan of the Republic of Serbia from 2021 to 2035	P D L	P D L	P D L	P D L	P D	P D L	P D L	P L	P L		P	P	P	
2.	Regional Spatial Plan of the Kolubara and Mačva Administrative Districts	P D	P D	PD	P D	P D	P D	P	P D			P D			
3.	Spatial Plan for the Special Purpose Area "Ovčarsko-kablarska klisura"	P D L	P D L	P D	P D	P D	P D	P D L	P D	P		P			

P – protection, D – development, L – landscape.

Table 2.
Elements of the implementation model for the protection and development of landscapes in the spatial plans analyzed.

the legislative framework, procedures and assessment of the quality of the plans, which is not the subject of this paper.

In the opinion of the authors, the most important conclusion concerns the relationship between aspects of protecting cultural heritage, its sustainable development and its integration into planning and protecting landscapes. Out of all these elements recognized in the plans, most concern the protection of cultural heritage, of which there are 31, followed by the elements of development (rules of arrangement, presentation and tourism), of which there are 23, but only 11 elements concerning the integration of cultural heritage in landscape planning and protection. This points towards the basic conclusion of the research, that protecting cultural assets and their environment in the narrower sense dominates the planning practice of Serbia, which is in itself justified and necessary. However, this does not sufficiently consider and plan for the sustainable development of cultural heritage, because there is insufficient elaboration of elements that would indicate the rules of construction and spatial planning in their environment, along with their unification and further planning development integrated with tourism (cultural routes, tourist areas, etc.). This is even more pronounced when considering the aspect of integrating the protection and development of cultural heritage into the planning and protection of landscapes, which is not developed in the practice of planning in Serbia. Indeed, it is considered only in a general and declarative manner, and only in individual cases.

6. Conclusions

Alongside the starting point that spatial (and urban) planning is of key importance for the sustainable development and protection of cultural heritage, this paper aimed to, based on the analysis of previous experiences, point out the need and possibilities for further improving the spatial planning process.

The fact is that in the current practice, cultural heritage is not clearly articulated as a development resource, and the connection and harmonization of policies for protection, arrangement and use of cultural heritage has not been achieved, especially in the case of the cultural landscapes and areas mentioned here. The Law on Cultural Property is not sufficiently harmonized with international recommendations, and does not recognize categories of the cultural landscape. The plans mainly include data on the number and category of cultural assets, as well as measures for their protection, obtained from the competent protection services.

The case study of three spatial plans confirmed the basic hypothetical assumptions of the research, that the methods used to plan areas of cultural heritage differ depending on the type and level of the spatial plan. The plans identify aspects of protection and the sustainable development of cultural heritage, and also in part their integration with landscape planning, but with obvious important shortcomings.

A key conclusion was reached based on this analysis, namely that there is no dominant and developed concept of protecting cultural heritage that has evolved into a system of comprehensive and adequate planning for its sustainable development. Therefore, in the coming period, it is necessary to improve planning methods and techniques in order to fully consider the sustainable development of cultural heritage in spatial plans. The first step in this can be the detailed planning and definition of all of the necessary rules for the arrangement and construction of space (urbanistic rules) in the vicinity of cultural heritage (protected or wider), the application of which would enable the construction of traffic and infrastructure systems, tourist facilities and infrastructure, and even those elements which reinforce the very aspect of protection from new activities in the environment. This would enable adequate presentation of cultural heritage, and the spatial connection

and definition of cultural areas and cultural routes at the international, national, regional and local levels.

Such spatial planning would be a really key instrument in the implementation of European policies, which emphasize a contextual approach and expansion with regard to the subject of protection, from individual monuments to wider spatial units, as well as the need to integrate conservation and protection strategies with development and planning documents, and others.

In addition to the above, it can be further concluded that the lack of integration between protection policy and the development of cultural heritage in the planning and protection of landscapes is even more pronounced. It is interesting to note that the analysis indicated that this type of integration is only found in the Spatial Plan of the Republic of Serbia, i.e., at the national level of planning. The planning and protection of landscapes are not considered in other spatial plans. This further raises issues and needs for improvement, not only with regard to planning, but also legal regulations that should make integrated aspects of protection and development of cultural assets mandatory in landscape planning.

Based on the examples analyzed here, one gets the impression that in practice only the integration of the protection and development of cultural heritage with the protection of natural heritage has been truly achieved, that is, the integration of different aspects of protection.

Finally, all the above findings presented by the authors in this paper need to be further researched and scientifically shaped. The shortcoming of this research could be its small scientific sample of three spatial plans. With an increase in the number of spatial plans analyzed, i.e. the number of cultural assets and the area where they are located, it is certain that the research results would be more precise and significant. Indeed, that is the imperative of the planner in the period ahead.

Finally, in the opinion of the authors, this analysis of models and elements of implementing plans also highlights those general shortcomings in the plans that need to be eliminated and solved by improving planning methodology. This relates not only to the issue of the protection and sustainable development of cultural heritage, but also to numerous other aspects and subjects of planning (the economy, traffic, settlement networks, regional development, rural development, etc.). It especially refers to the concretization of planning solutions, determination of priorities, measures and instruments of implementation, and in particular elements for monitoring the implementation of spatial plans. The more precisely defined the implementation framework of spatial plans, the greater their role in integrating the protection and sustainable development of cultural heritage with other aspects of development.

Conflict of interest

There is no conflict of interest.

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Chapter 20

Can Solidarity Paradigm Be a Catalyst for the Sustainability of Tourism?

Mustafa Doğan

Abstract

The destructive effects of tourism on society, the environment, and the economy are among the phenomena that are widely known and discussed, like many other industries. Tourism, as one of the most reckless events of consumption fetishism, has a dynamism that affects sectoral development too on a demand basis. In these respects, it is considered that tourism should be rehabilitated in order to be sustainable despite its many positive effects. Although the "consumer and individualist spirit" of tourism is distant to collective, solidaristic, and restrictive-controlling approaches, it is expected that there will be a need for more interaction and association with these aspects in the new paradigm areas of the future. This study focuses on the habitual attitudes of tourism with the possible expectations of the future and discusses the solidarity tourism forms for the sustainability of tourism. It is clear that is needed to ask the economic, egocentric approaches in tourism. The paper predicts the more responsible, acceptable, fair, and conscious tourism can be possible if the spirit and face of tourism are able to turn to the solidaristic, and sustainable direction.

Keywords: Tourism, Solidarity, Sustainability

1. Introduction

The period that tourism emerged as a sector or industry coincides with the time that travel was begun to realize as a leisure activity. The most striking feature of this period is the industrialized economic structure, large industrial cities, and predominantly low and middle-income working classes in urbanized social life. Before this period, of course, there were some travel forms such as the 'Grand Tour' in the 17th and 18th centuries which European and especially the British nobility saw as a means of educating their children [1] and ¨Orient Express" tours that the rich and noble classes travel to the East for learning, curiosity, excitement, and adventure in the 19th century. These travels were luxury activities of tiny wealthy classes as a limited and small numbers and tourism were not exist as an industry yet.

It is after the 1960s, the travel became massive, widespread as a leisure activity, and the tourism industry was developed with the destinations, facilities, services, and all supplier [2]. The motivations of the process were basically the ending of two World wars, opening of the international airspaces and borders; booming rapidly of the civil air transport as well as land, sea, and railway infrastructures and transportation vehicles. On the other hand, the employees who occupy demand side of the

tourism, achieved improvements relatively in the working conditions and incomes. In this period, a suitable product has been created according to the new production relations. Finally, the tour operators as the main actor and producer of the process created and presented the ¨package tour -inclusive tour- holiday package¨ as a new touristic product to the masses.

In fact, early time of tourism the flows were revealed as a periodical displacement movement from the developed countries towards the developing or undeveloped countries; from the wealthy north countries to the poorer south countries for resting and enjoying in summer seasons. This great movement of people has significant positive and negative consequences on nature, societies, cultures and economies. Package tour products were created in focusing on the sea, sun and sand, and attractive climatic destinations. After that, tourism developed based on the cities as a part of heritage or culture and it developed the facilities and services such as hotels, restaurants, transporting, and tour activities in the cities. The hosted countries have extended with heritage tourism throughout the developed countries' capitals such as Paris, London, Amsterdam, Berlin. It is clear that tourism has developed significantly as a result of the increase in leisure time and incomes, changing technology, and transportation opportunities, and motivated many types of tourism.

Today, tourism has become a major economic sector and not only for the developing poor countries but also developed wealthy countries in the world. However, rapid expansions of destinations have many negative aspects with regard to the potential of inflicting damages on nature, communities, cultures and societies and this dual nature of tourism, projected onto its forecasted growth, requires an urgent integration of preventative approaches in all tourism strategies, development plans and actions [3]. As a result of the huge and seasonal human mobility, tourism has also caused many problems at the local and global levels. More than one billion travels have realized annually to an outbound destination independently or organized since 2012 and revenues from visitor spending have grown faster than the world economy [4]. Heritage tourism, coastal-sea tourism, and sub-types of those are largely responsible for these figures but interestingly, tourism has been continuing to develop with many niches and hedonist types. It is one of the largest economies of the world and everywhere has a dual function such as arrival destination and sending country for the tourism. Though the economic advantages of tourism tend to be appreciated by the industry and governments, the negative effects have also been begun to consider the social, environmental, and economic. This is a stage inevitably that causing damage to the physical and moral assets of nature and people anymore.

2. The realities of tourism and sustainability

Tourism has a significant driver that can transform everything and everywhere. It is also fostered by many supplier industries and has a integrated international relationships. While developing tourism and increasing facilities have shown to maturity level for many popular destinations of the world there are also recognized some issues dependant the tourism development. The economic benefits of tourism often come at a high cost paid by nature and societies, endangering the core assets of tourism itself: nature and human cultures [3]. This was seen with some dimensions such as environmental, social, economic in first destinations where tourism developed as remarked by Doxey [5] and Butler [6] in many countries around the world. All of these changes were not seen only on physical assets but also social and moral values and it was perceived positive or negative depends on benefits of the local communities. However, the residents of communities dependent on tourism

can clearly differentiate between its economic benefits and the social costs and negative consequences can be seen tolerable towards further tourism development [7]. In some cases, the economic benefits of tourism are more than outweighed by the environmental and social costs of tourism [8] and it was revealed in some researches [9–11] that the residents' perceptions or support for tourism more positive attitudes or support for tourism among those who either had a direct relationship with the tourism industry or perceived they would gain benefits from tourism. The economic interests are still importance as a decisive motivation particularly for residents who has an income from tourism, instead of to care of the social and environmental issues.

Although the economic advantages of tourism tend to be highlighted by the industry, the adverse effects have also been considered [12] and even so, the development of tourism and alternative tourism markets has been questioned by many scholars [3, 13–18] who criticize the focus on their commodification. Residents are likely to understand the benefits that come with tourism (e.g., job creation, better incomes, improvement of existing facilities and infrastructure and opportunities to meet new and interesting people) just as much as the costs such as crowding, increased costs, higher taxes [19]. Tourism has also an important role in enhancing cultural exchanges, improving living standards, supporting cultural preservation and stimulating locals' pride for their community or culture; however, it does not necessarily mean that they are always the results obtained and instead of exchanging cultural experiences, in many cases locals become 'attractions' for tourists, altering their own traditions and culture to exploit their commercial potential, and gradually forgetting their importance [3]. Commodificiation of the autentic-local cultures with imitaiton has become as a common picture that is expected as a performance from the local communities in destinations.

When residents experience negative consequences such as crowding, noise pollution, vandalism, and even negative environmental impacts, they will be more likely to oppose tourism development [20]. When residents perceive more costs than benefits, they are more likely to have negative perceptions about tourism activities and therefore demonstrate a lack of support for tourism development [21]. But residents living in areas with a more mature tourist industry are more aware of both positive and negative environmental impacts [22]. Lankford [23] found residents had more negative attitudes towards the benefits of tourism and support for tourism, and its environmental impacts than business owners, government employees, and officials. For instance, in the last decades, there are two key mechanisms that stimulate conflicts in the city destinations: the number of tourists in relation to the number of residents and its distribution in time and space; indecent behavior of tourists [24]. It is clear that such positive and negative attitudes have been linked to residents' level of support for tourism and relationships with tourism.

Tourism as a complex sociocultural dimension of modernity has the same general principles of capitalist consumer culture and commodification is viewed as an all-pervasive characteristic of modern capitalism and involves commodity production and standardization of products, tastes, and experiences [25]. The negative impacts of tourism are not limited by these, it extends along with commercialization, imitation. The dominant way commercially successful destinations have organized touristic experience has been to model themselves as closely as possible on the ego and also other commodities sold on the basis of their intangible qualities may be implicated in the same narcissistic ego structure [26]. It is seen that there is a gap between general awareness and preferences on the one hand and the practices and behavior of tourists and tourist industries on the other hand [27]. The power of the consumer can be a major force for progress towards greater sustainability by the tourism industry, acting as a rationale for change [28] but, the transformation of

tourism from being an elitist activity is primarily related to the industry's cessation of being tourist-oriented. Basically, the challenges are stuck between the objectives of sustainability and ego-based consumption. There is a vital need for the tourism industry to capitalize on this awareness for a wider range of product information and so promote moves towards greater levels of sustainability in the industry. The current system of neoliberalism and its attendant culture-ideology of consumerism are inherently unsustainable, it is needed to consciously move away from this value system to one less damaging [29]. In this context, the sustainability approach can provide available ground for the rehabilitation of the industry.

Sustainability and competitiveness go hand in hand as destinations and businesses can become more competitive through the efficient use of resources, the promotion of biodiversity conservation, and actions to tackle climate change and it is a key part of tourism policies [4]. Indeed, the sustainability approach that emerged as an environmental reflex in the 1980s, has been adapted for all industries as well as tourism. Sustainability can be seen as a new correction movement to counter consideration of capitalist development the consumerism and destructive tendencies of the current international economic system and to underline the importance of the needs and rights of the next generations [12]. It is possible to read as a multi-reflex against the consumerist mindset of the individuals, industries, and economic structures. A central tenet of sustainable tourism is the consideration of the relationship that exists between residents and tourists [30]. As a part of sustainability, it is needed to consider the local stakeholders and particularly local communities by decisive directors of the tourism industry. Concepts such as sustainable tourism development are seen by many as the answer along with the enhanced planning and managing of tourism [8]. Sustainability as a perspective tries to protect nature and to minimize the negative and destructive effects of tourism on the continuing life is increasingly being recognized but, as a concept [3] it cannot be achieved if mass tourism practices are not adjusted to integrate sustainability. One key to successful sustainable tourism is to strike a balance between providing necessary income to residents and not overexploiting the resources [31]. But, perspective should not be limited to the economy and should not be thought only to transfer income to the host, the resources such as social construct and heritage should be considered by all. Sustainable tourism forms must be thought about and combined with its economic, social, cultural, and environmental dimensions.

3. Solidarity paradigm

The theory of emotional solidarity comes out of sociology and the work of Durkheim [32] and he posits that the most basic of religions have two fundamental attributes, beliefs and behaviors, that serve to bring about solidarity among members. Durkheim [32] describes solidarity through three variables possessed by the group: shared behavior, shared beliefs, and interaction. According to him, there is an emotion-based sense of community in such groups, and the norms that are part of the community constitute a strong force constraining individuals and also there is a strong and specific collective conscience that enhances uniformity of behavior across individuals [33]. The concept of solidarity is complex, multi-dimensional, normative, and escapes a single definition [34]. Specifically, solidarity is defined that is the existence of a given set of actors to the degree that they are directly connected to each other and there is an absence of subgroups or cliques [33]. Oosterlynck et al. [35] underlines four main sources of solidarity as interdependence, shared norms and values, struggle, and encounter; Agustin and Jorgensen [36] differentiate between autonomous solidarity, civic solidarity, and institutional

solidarity; Gaztambide-Fernandez [37], distinguishes between relational solidarity, transformative solidarity, and creative solidarity; also he thinks when informed by the failures of responses such as multiculturalism and cosmopolitanism to the problem of human difference, solidarity remains an important possibility. Considering these three dimensions of solidarity the debates on realities of social and economic irrationalism can find some affordable solutions.

Hume ([38], 215–216) emphasizes that emotions guide reason and decision-making, claiming that reason alone can never be a motive to any action of the will, and that reason can never oppose passion in directing. Woosnam and et all. [39] offer the theory of emotional solidarity, put forth by Emile Durkheim, as a theoretical framework to examine the relationship between residents and tourists. Woosnam et al. [39] conceive of solidarity arising from the shared beliefs and behaviors (as well as interaction) among individuals. Wallace and Wolf [40] considered emotional solidarity to be the "we togetherness" that binds people. The emotional solidarity refers to a feeling of closeness or bonding that individuals experience with one another in a relationship of mutuality that goes beyond simple financial transactions [41–43]. So, emotional solidarity is a very important component of tourism that is able to create a functional relationship for the solidarity sides and it is considered the degree of closeness between in- individuals, whereby a sentiment of 'we together' is championed over the notion of a 'self-versus-other' dichotomy that is so prevalent within the tourism literature [39].

Solidarity requires actual duties to action, and one does something for the others. In cases where there is a lack of social solidarity, individuals can have difficulties coping with disruptions and cooperating to respond to them and it could also raise the collapse [44]. A basic aspect of solidarity is its focus on the poor, the vulnerable, the oppressed, and victims of violence or tyranny [45], sometimes from the developed and rich to the undeveloped and poor. It includes the national and international scales as social and economic. Solidarity is, on the one hand, related to a formal dimension that identifies group membership, such as having a passport of the same country; on the other hand, is an emotional dimension of identifying, for example, with an 'imagined' national community [46]. The persons who are generally a member of the welfare communities or countries, choose to do something for disadvantaged people or communities. There are many ways of solidarity with social and economic dimensions for the interacted people in tourism. It is possible to evaluate that can be seen as a collective balancing or adjusting movement that is fostered by the emotional motivations of tourists rather than the residents.

4. Possibilities of solidarity-sustainability in tourism

Tourism is recognized as a functional means for the development of the local communities, particularly those in rural areas. But this approach is usually limited by an economic perspective and is no cared the social sides and impacts on the local communities. In fact, this is a two-way process. On one hand, local tourism provides travelers with the opportunity to have a sense of a place where it is possible to share the traditions, stories, and experiences of the locals; on the other hand, this sharing reinforces the value of the rural way of life and the self-esteem of the community members and it can help build a more balanced relationship between host and guest [12]. Experiencing of the solidarity with those visited can be highly valued both of tourists and residents can mean living with together learning more about for both sides. Therefore, the form of the relationship between the tourist and those visited is one of the distinguishing features of this type of tourism.

The determinants of support for tourism development have not considered the role personal connections with visitors play in forging a positive perspective [47]. Two key interrelated concepts are critical in the focus on touristic solidarity: equality and empathy. Equality assumes an equality in the status and rights of the tourist and those visited and that there are reciprocal benefits for both; empathy, as the emotional and experiential understanding of others [48, 49], is necessary to understand local people and how they live their daily lives. Indeed, it is an essential trope of this type of tourism that it is a conduit for developing knowledge of other places and other peoples [50] and for developing cross-cultural understanding [51]. The sustainable versions of tourism that carry such ideas as the volunteer, social concerns, fairness, pro-poor and solidarity have similar objectives of strengthening local economic development and poverty alleviation. That is why, the concept of solidarity as applied to tourism can provide a useful and functional connection between a number of different but related concepts.

The sustainable in tourism have focused on nature conservation and more humanitarian projects and are at the core of a fair vision of tourism [52–57]. It tries to strengthen a primary responsibility on tourists to develop relationships with local communities. It is impossible to achieve successful and sustainable tourism management without securing the support
of the local residents who are a community's key stakeholders in tourism [58]. Putting the relationship between tourists and the residents on a more equal footing is one of the significant tasks in developing sustainable tourism. Consumers are already making decisions based on environmental, social, and economic quality for the products and are keen to transfer these habits to the purchase of tourism products [28]. The responsibility of tourism industry is the basic desire to obtain social, economic and environmental justice for all involved in tourism. But what exactly is this responsibility being ambiguous [59] and raises the question of how a tourism that fulfills these objectives can be realized and Goodwin [57] particularly underlines the need to consider the net benefits for the poor.

Some studies [47, 60–62] demonstrate that emotional solidarity is a significant factor in residents' attitudes that support the types of tourism that are close to a sustainable development model. Woosnam et al. [63, 64] found similar findings on the divergent perceptions of emotional solidarity between residents and tourists. Leap and Thompsan [44] argue that solidarities grounded in collective identities can act as important mediators between social heterogeneity and resilience and it will be especially important to account for solidarities and collective identities tied to rurality. It signs also crucial for tourism researches on rural areas and solidarity perspective. Doğan [12] discovered a distinctive practice of solidarity based on experimental and emotional, in a village destination where has a unique cultural heritage and ecomuseum. Riberio et al. [65] examined the solidarity from the visitor perspective and pointed out in particular, the relationships involving visitors' feeling welcomed by residents, emotional closeness with residents, and sympathetic understanding with residents and loyalty were all mediated by satisfaction. Residents have been more empathetic towards tourists in cultural heritage research because the latter has indicated the desire to understand the local culture and preserve local ways of life [66]. Doğan [12] discovered a distinctive and useful practice of solidarity based on experimental and emotional, in a village destination where has a unique cultural heritage and ecomuseum. Riberio et al. [65] examined the solidarity from the visitor perspective and pointed out in particular, the relationships involving visitors' feeling welcomed by residents, emotional closeness with residents, and sympathetic understanding with residents and loyalty were all mediated by satisfaction. The destination loyalty can be supported by the emotional solidarity that poses in visitors and residents. The occurring of the visit

in a sympathetic and welcoming interaction among the sides enhances the solidarity spirit along with sustainable benefit.

5. Conclusion

Solidarity paradigm and sustainability emphasize similar aims and possibilities for the different destinations and all stakeholders. In fact, the solidarity paradigm also helps to question how to realize the sustainability targets in any destination. It might be perceived as a tool to practice sustainable benefits and directions. The sustainability approach in tourism is seen as an opportunity to transform everything including people, nature, and culture. In this context, the solidarity paradigm enhances the sustainability of tourism, particularly in each destination, and contributes tangible opportunities to stakeholders. Although the visitors and residents have a flexible potential for the transformation, in fact, it is more vital to transform other stakeholders such as producers and suppliers. The consumerist and tourist-oriented view in tourism might be criticized throughout the sustainable and solidarity principles. It is likely that to find some opportunities to check it again. It is clear that the new trends such as sharing companies, networks, and improved technologies in tourism could present new opportunities to the people and communities but, pure capitalist logic and with the objectives that focused on the market cannot be provided benefits expecting from the future. So, if sustainability is seen as a correction movement in tourism, the solidarity paradigm can be one of the catalyzers of the change.

It is undoubted that the sustainability of the tourism industry loads functional duties for all stakeholders. Today, it is too risky to continue with traditional approaches in tourism. There is an important wind towards to sustainability phenomenon that is dragged by global warming and climate change, worldwide. Under the press of the sustainable growth targets, governmental politics, and plans, in particular, the accommodation and travel businesses have started to practice greener programs, and the environmental sensitivity efforts increased beyond marketing in the last two decades. However, environmentalism is only one side of sustainability and it is needed to improve particularly socio-cultural and economic dimensions. Solidarity paradigm as normative perspective and experiential practices can be useful in these fields. In the future, tourism should be moved to a position that includes more interaction between visitors and residents along with equal, fair, and cooperative.

Many types of tourism where are realized in rural areas such as agro, nature-based, ecological have an important transformative potential in order to develop a solidaristic and sustainable mindset among the residents and visitors on the current structure. On one hand, the rising of independent tours, and technologic easier support the developments of these opportunities, on the other side, the businesses of the industry should contribute and extend the sustainable practices for the other tourism forms. The raised awareness of visitors and residents, changing prefers and the new factors on the decision-making process may challenge to alter the mechanic, hedonist, and non-humanist tourism. Hence, it can be predicted that is needed to ask the economic, egocentric approaches in tourism.

The more responsible, acceptable, fair, and conscious tourism can be possible if the spirit and face of tourism are able to turn to the solidaristic, and sustainable direction. The habitual attitudes of tourism must be asked in terms of solidarity and sustainability for a better future. It should be expected that there is a need for more interaction and association with these aspects in the new paradigm areas of the future.

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Section 4

Conservation through Entrepreneurship

Chapter 21

Synergy between the Church and Government in Community Development: A Sociocultural Entrepreneurship Approach

Suwarto Adi

Abstract

This paper aims at describing the church strategies for doing community development. As a religious institution, when doing development community, the church often confronts questions about conversion or evangelism. By implementing the entrepreneurial approach, community development programmes allow for synergy between the church and government to support sustainable development. Building on field work conducted in in three areas of Indonesia: North Sumatera (2008), Sumba in Eastern Indonesia (2010) and Central Java (2015), this paper argues that the church should seek a synergetic, equal partnership with the government in implementing community development projects. In the process it is essential for the church to practice and advocate for good governance. Engaged in such a process, the church has an opportunity to witness through community development as a manifestation of social diaconia. Oriented to public service, social diaconia seeks the common good, *bona ecclesiae*, where wealth is to be managed and grows to help the poor.

Keywords: church and development, good governance, entrepreneurial approach, synergy and partnership, social diaconia, bona ecclesiae, Indonesian church

1. Introduction

Community development would give rise a good result if it carried out in a synergy or partnership [1]. The church is one agent of the social change in the community, possible to play a significant role if it can synergize between itself, the government and community. It is illuminated by religious values, the church in developing a synergy could promote the model of development that openness, social justice and participatory are as important basic values [2]. So that, by such a promotion, the church always presents Christ—that incognito lived with human and being equal with them—is as a model that all participatory development to refer [3]. Additionally, to establish development rooted in community, it needs social and cultural approach; while to encourage people eager to solve the problem in sustainable way, it needs an entrepreneurial approach [4].

The problem is how the church could do a synergy? What mechanism is to be applied? Is there a theological obstacle for the church to synergize between parties

working with the community? One basic element to make a synergy is partnership, and in the history, partnership is inherent thing in the body of the church. As the body that One and Catholic, the church is always doing partnership in the life and its history, particularly among churches and then between the church and other bodies that existed in the community. Is it possible to apply entrepreneurial approach for the church diaconia in implementing community development?

This paper is aiming at describing the problem the church is facing when doing a community development. As a religious institution, when doing development community, the church often confronts the problem dealt with issues conversion [5]. Therefore, the church as a religious body bears a secular identity when doing development in the community [6]. Regarding the partnership and synergy, the church often implements some models to keep the programme well taking place in practice in the community.

2. Research method

It is composed of several field works in three areas of Indonesia: North Sumatera (2008), Sumba in Eastern Indonesia (2010) and Central Java (2015); this paper is seeking to map out the problem of the church in community development and how to solve the problem by implementing an entrepreneurial approach. What does entrepreneurial approach mean here is not limited on the economic aspect, but it is covering the large definition of entrepreneurship. So, entrepreneurship here embraces the idea of innovative and creative and how both stances are dealt with the social transformation [7].[1] While sociocultural approach to the entrepreneurship means that all efforts to solve the social and developmental problem, either using social or cultural values, are construed as entrepreneurial activities; and the people are doing such a thing and living out as habitual and are categorized as the entrepreneurs.

To deepen the entrepreneurial character of the church members, this research borrows from Bourdieu's concept of habitus and practice [8] as social action. It means all new practice of entrepreneurship as social means to develop the developmental programme is traced back to habitus or mental disposition since the people were still young [9, 10]. It is based on such methods we found that the people had a long experience in navigating social problems, social relationship, and all social dynamics in the society are open to the new ideas and being creative persons [2]. Eventually, if such things are continually developed, it could support them to be agent of social change in the developmental processes [4, 8, 9].

Bourdieu stated that: '[Habitus].....it ensures the active presence of past experiences, which, deposited in each organism in the form of schemes of perception, thought and action, tend to guarantee the "correctness" of practices and their constancy over time, more reliably than all formal rules and explicit norms' ([8], 54). In addition, by habitus, we can understand how the actor could do practice in a constant way. If implemented in the developmental transformation, it could generate people to be agent of development, as it explained: '(T)he habitus makes possible the production

[1] Scholars from several contexts, particularly in Africa, have developed such approaches. However, what they are applying is dealt with the gospel prosperity, for instance, Lovemore Togarasei, "The Pentecostal Gospel of Prosperity in African Contexts of Poverty: An Appraisal", in *Exchange*, vol. 40 (4), Jan. 2011, pp. 336–346; or James Kwateng Yeboah, "The Prosperity Gospel: Debating Modernity in Africa and the African Diaspora", in *Journal of Africana Religions*, vol. 9 (1), Jan. 2021, pp. 42–69. Both papers discussed that entrepreneurial action is an expression of prosperity gospel, but what I discuss here entrepreneurship is an extended of theology of work in a new dimension.

of all the thoughts, perceptions, and actions inherent in the conditions of its production and only those. Through the habitus, the structure of which it is the product governs practice, not along the paths of a mechanical determinism, but within the constraints and limits initially set on its inventions' ([8], 55).

When doing a field work in three areas, the author was doing a combination between in-depth interview, FGD and collective interview; and on some occasions, the last method was sometimes very effective to get data simultaneously as a kind of validation, as well. To make it a context analysis, Indonesia development is to refer as the large context of this paper. However, analysis of the development of Indonesia, post-modern perspective is used [11]. So, by this way, the church and its role in the partnership could be placed, and the dynamics of the partnership of the church and other organizations could be presented in a balanced way.

3. The church, entrepreneurship and development

Despite of all the definitions, entrepreneurship generally refers to the character of innovative and creative [10, 12], or a kind of novel recombination of products, services or processes to give rise to a social change [7]. Furthermore, in a cultural sense, entrepreneurship refers to ways of embedding a story in the conduct of an activity [4]. As another definition that Ratten [4] developed in the cultural sense, she defined that entrepreneurship is 'the process of storytelling that mediates between extant stocks of entrepreneurial resources and subsequent capital acquisition and wealth creation', and from such a definition, it could be enlarged that entrepreneurship is a kind of narrative that empowers people. Therefore, by developing such an entrepreneurial narrative, energy of the people is a source for implementing the development. This means that cultures enable verbal and non-verbal symbols to be used as the way to represent stories to set up identity and developmental processes ([4], 2–3).

In terms of pedagogy, an entrepreneurship needs to be embodied culturally by educational processes, particularly among young people. The aim of this is to encourage young people and others as active of developmental agents as well as by becoming agents, people are to be active and curious of resource they have and to develop and improve their life by developmental program and activities ([9], 15–17). With regard to the entrepreneurship as cultural narrative, young people need to encourage expressing their own faith bravely and independently. Therefore, in this context, the church should implement an entrepreneurial pedagogy to motivate and encourage their own agency in developmental programme. By doing so, developmental activities are places for them to actualize and witness that they are productive workers [6].

In addition, entrepreneurial activity is an arena where creativity is an essential thing. If the church implemented an entrepreneurial pedagogy, it aroused people's curiosity prompting intentionally proactive behaviors in response to novelty, complexity, uncertainty or conflict. Curiosity equips people to be situationally, relationally and vocationally agile, and curious people show signs of experiencing higher levels of well-being [9]. Shortly, an entrepreneurial pedagogy creates an ecosystem that is safe for young people who discovered solutions, and these are that they are expecting that will be beneficial for adult's schedules and contexts ([9], 15–17), and eventually, it brings about prosperity for all.

In this context, entrepreneurship is not viewed from traditional theory that tended to focus on economic objectives derived from business activity, rather than this entrepreneurship is related to the cultural or lifestyle where entrepreneurship value is derived [4]. This means entrepreneurship is contextual in nature.

Therefore, if we make an entrepreneurship relate to the development, it is a compatible thing. Or, if we elaborate more, entrepreneurship is to be one solution for developmental problems. The more people to be entrepreneurial persons, the more community developed. In other words, if entrepreneurship is embodied culturally and brings about cultural entrepreneurship, it could be a means of cultural or local development [12]. Such a process, at least, is in three main forms: making culture, deploying culture and cultural making ([4], 2), and through such a process, the development is a cultural or habitual one.

The church as an important local institution, by entrepreneurial pedagogy or cultural making of entrepreneurship, can play a significant role. In the context of pedagogy as aforementioned, she can shape an entrepreneurial character of agency and curiosity, to make development sustain for a long time, and in terms of practice, the church also plays a role as the network broker bridging entrepreneurs and external partners, connecting them to achieve mutual benefit and as entrepreneurial support organization directly assisting entrepreneurs and networks by providing access to information, capital, support services and training as well as by promoting local entrepreneurial cultures [13].

If the cultural entrepreneurship is compounded by religious values, it will empower Christian people, either leader or lay people to be agency for social transformation [7], and it was a faith expression of Christian people in partnership with the community of faith that can be a means to overcome materialism, individualism and self-centredness [2]; and it will rise 'religious entrepreneurship for holistic transformation'. New contextual churches are freshening the religious landscape of the global North. One core theological principle of the 'entrepreneurship for holistic transformation' is the belief in a 'the kingdom shaped the church'. The entrepreneurial model intends to offer an open, just and loving relationships—with God and with others, in contrast to the predominate consumer-oriented relationships found in the world and in other models ([2], 333–334, [7], 348–349) of secular societal development.

4. Indonesia development: to build from the edge or border

Indonesia is the largest Moslem-Democratic State in Southeast Asia [14] and implementing *Pancasila* as official basis of state (*dasar negara*). Therefore, in Indonesia, there is no 'state religion', even though Islam is majority. The numbers of Christian people is less than 10% totally; accordingly, the church has no financial contribution from the government that is provided regularly. The church should be independent in financial aspect by itself [15]. If we put it in the context of development, the church seeks to secure the development programme to improve the life of the church and community members.

The Christian people, despite the number being less, are mostly also located in outer Island, outside Java, which is identified as the underdeveloped area. In this context, the church is experiencing a double burden of social discrimination: minority and backwardness. This situation is taking place for a long time, and since the last decade, it seemingly is going to be changed. The new spirit of development in Indonesia is that the government is to build from the backward area and distribute justice for all people of Indonesia.

If we look at the context of Indonesian, the current government anchored the official slogan of development: 'to build (Indonesia) from the edge or border', *membangun dari pinggiran*. This phrase or word, apparently, is simple one, but the meaning that bringing with is profound. We know that what it means the edge or border areas are in or located outside Java, other islands. Furthermore, by using this

phrase, to some extent, is bringing about social exclusion or limitation, because as if there is a gap between one and another, particularly Java as a model of development in Indonesia. There is a boundary—and not only a border—that invisible and shaping perception results in a different identity with others ([16], 53).

Border, its meaning is dealt with territory or physical zone, or more specifically it refers to a demarcation line of group or ethnic; it is emphasizing on the border physically or see-view thing; while boundary is a kind of imagery concept that embraces a culture and identity; border is a social fact, while boundary social construction ultimately forms a consciousness ([16], 57, [17], 47–49). The concept of ethnicity, in political point of view, relates to boundary and tends to be political claim and simultaneously defined as a kind of restriction, either physically, geographically, and it functions as a mockery or stigma to ignore people or ethnic in the name of social group [18]. By implementing the concept of ethnicity or boundary, construction of discrimination, mentality and identity—in the negative nuance—is applied as a means of domination between one group and another in a community or, largely, in the state.

Employing such a definition to give a criticism the word of edge, *pinggiran*, we can construe that the Indonesia development today is to make a comparison and separation between Java and outside Java. As if what happened in Java is on advance rather than in the edge. This model of development is apparently 'honor' or to lift up the edge zone, but actually, it is a kind of 'lowering' to the location or area that called as the edge. In addition, in the concept of boundary, the grouping of ethnics is taking place and to them is labeled underdeveloped or another term of backwardness. Borrowing Cohen's, boundary is related to how the individual image is constructed by forming a collective consciousness; and it is taken for granted to a group unfairly without opportunity to ask what label attached to them ([16], 54).

The concept of boundary is developed to set up identity, either socially, psychologically or mentality of the backwardness [17, 18]. In the concept of boundary, people felt that they underserved to access, privilege and other benefit that others have and get in the other places. It caused a social exclusion, expulsion, limitation and social isolation. Shortly, naming the edge region or backwardness area is a kind of form of the injustice: stigma making, destiny lowering and false-consciousness of the identity and limitation upon the social-economic access among people the rights to develop and the development.

It is based on such an understanding, the developmental model that applied to the edge region is the Java-centred one—it assumed that Java is more advanced rather than others. Accordingly, by such a model what happened is the 'Javanization' of the development. What is in Java the appropriate model for another region of Indonesia that is underdeveloped or backward? It starts with education to economy, Java is a model to follow; as well as from how to build a school building to mall or market building [17]. There is no empowerment and bottom-up participation of the development.

The developmental process is not seemingly an overhaul of a machine. Everywhere and every time the development is applied in the same mechanism. The development is a multiparty process and seeks to harmonize one and another. By placing Java as a model, a developmental process is going to an end. It will stop when the developmental process is started. It cannot give rise to a sense of belonging; without open participation, a sense of belonging is not growing. The concept of the edge region needs to revise if it wants to enact the sustainable and rooted development in Indonesia. Instead, it needs a new approach by developing human potencies, and then it empowers people to be creative energy of development. There is no edge region; what happened is the region is forced to be in the edge because of political or ideological aspect.

To eliminate the edge region or zone, it needs an empowerment, either by developing entrepreneurial mentality or culture that gives an opportunity of creativity for all people. Entrepreneurship is meant as systematic approach of changing habit of people and encouraging them to dig out the potency they have and embody it into people's inspiration-based developmental programme. By applying such an approach there will be a new culture where people are free to think and to do creatively to optimize the potency they have, either socially or culturally. Such an approach is related to emancipation of what Marx had been thinking that to change the environment where people live to be a meaningful context of life, people need an emancipation—to know self as a subject of being that able to think, create and solve the problem they are facing, either individually or collectively [19]. Also, this emancipation is closed to the concept of human being as God's image. After human beings reach an emancipation, the entrepreneurial mentality follows. In other words, emancipation and entrepreneurial are a pair of words that is important in developing community.

5. Religion and/in development

In the developmental process, the involvement of religions is important thing to consider. It means decision to develop is related to how to build a social life better, strength and integrate. Furthermore, by new stance to the religion, the development today is linked to the religious values to achieve better result. It was generated by the proponent religious NGOs in Germany and Netherlands that took part in shaping the model of development today, as expressed in millennium development goals (MDGs) and/or sustainable development goals (SDGs) led by the UN [6]. Therefore, religious values are inscribed or attached in the developmental processes. It is in contrary of what had been in the past that religion is excluded from the development planning and its implementation. Within such an approach, religion is not merely an object of development; instead, religion is to be an important factor or subject of development. It is expected by new approach of development, it brings about a justice for all. In this context, religion is no longer moral guardian of development, but it will be a giver direction and ethical base for the developmental processes; so by doing it, human values and justice will be important values in the developmental processes.

It is based on such a view the religious institution or leader should be the 'prophet' in developmental processes. A prophet is not just a rites leader, but she/he is a person that always presents and involves in each process of development: encourages for voicing a justice for all—or in other terms, development as religious discourse [20]; and simultaneously, religion is a source of power for people that is a victim of development and shape development and religious dimension of survival strategies [21]. In addition, outside the role mentioned above, religion also can be a 'referee' for all dispute taking place among people involved in a development, and its role is giving a fair decision, even though in doing this there is a risk to bear [22].

In the context of the poor, religious institution—in this context the church—should be living together with people that involve and engage in development; and in the context of referee, the church can make a partnership with the government to issue policies that it will bring about a good decision for people; and if necessary, the church could be the people's advocate when the government violates them by transgressing the human rights principles. If the church should do all activities, she could make a critical partnership with the government and able to develop solidarity with the people that are victims of the development [1].

6. Human development:synergy between the church and government

Synergy can start with partnership; the development programme is to improve the life of the poor by providing them goods and services can be developed into synergy. Among the churches, partnership has a long tradition, as stated:

> *'Partnership is important.....the work of helping others is not only the church's task, but it is collective work. The world is the field for all people to give a service. To do this service, the existence of a partner is necessary. The main partner is the church, then mission body that in the past sowed the seed of the Gospel here; partnership is reflecting a reality that the church is one'*[2]

By implementing partnership the parties that cooperate each other are expecting to do a programme in equal position; and it is to come up because one and another has a limitation,[3] therefore, by partnership there will be a common strength, and it is to enlarge the service of community development.[4] In terms of governance, synergy includes what the government and other sector in community had to do in overcoming the problem that arises and growing the common good [23]. Synergy to some extent is reflecting a human solidarity, moral, political and ideological or spiritual between those are in the North and South to join and seek social transformation collectively [24].

It is related to partnership synergy that stake place if there is a mutuality: there is common objective to achieve [25]. In the more positive context, continuing what Brehm [26] developed, synergy could be construed as a commitment to mutual interaction in long time and share of responsibility, mutual obligation and power equality. Analytically, synergy has two important aspects or dimensions that are a combination of relational and organizational:

6.1 Relational

This dimension is emphasized on how partnership is effective to implement, and it includes some aspect, among others, mutuality, clear expectation, rights and duty, accountability and transparency. What support these are the principle of trust, expectation, appreciation, integrity, credibility and ownership. It means that partnership is dealt with trusting relationship where each and other are mutually open and responsible [26]. If a partnership is not supported by such principles or values, it will be an unequal partnership. To embody such a partnership into practice, it needs some instruments, i.e. agreement, memorandum of understanding, and it will content what it must do and how to share the burden and responsibility between parties taking part in partnership ([27], 15–17).

In one FGD with some churches and religious NGOs on the partnership and its relational dimension, there was a good idea on the partnership, as following:

> *In the context global, partnership to be build is not to make other as an object, but to develop its capacity. In the partnership, the local resources are necessary. By improving capacity, it will rise an ability to solve the problem, and it brings an impact that service to others is improving them.*[5]

[2] Interview, NS_Btg.

[3] Interview, AP_Skm.

[4] FN_FGD_Mdn_08.

[5] FN_FGD_Mdn_08.

Through partnership there was an enhancement capacity among those involved in the partnership, in managerial, personal and cultural aspects. Because when implementing partnership, there is a learning process between one and another.

6.2 Organizational

The issue of how to manage synergy through organization is the core thing of the organizational dimension of partnership. Or, how the partnership is institutionalized in formal way, so that it will be effective to implement. It means, if one organization has no organizational culture, system and mechanism, it is difficult to enact an effective partnership. For instance, if the State does not have the clear system and governmental management, it will be difficult to find international partner of development. If the dimension of relation of partnership is closed to values and character, while the organizational dimension covered the tangible thing: management and governance.

Refer to the above explanation, synergy in the development programme is a necessary [28]. It is impossible to grow the rooted development without synergy among parties, particularly between government, commercial sector and community, including in this context the church. However, in developing a good partnership, particularly between the church and government, both must develop a mentality or culture of the good governance. Partnership without good governance will fall into exploitative one. It means, there is possibility one party exploited by other, or distrust of one and another, because there is no common platform to achieve the common goals. It is expressed, by someone:

> *'Beside trust, openness, transparency, and accountability are the important values in a partnership. It means, good governance is to be basic principles. Encountering such a situation, it needs a maturity. Sometimes, good governance principle is to be a means of pressure in a partnership. If we can not negotiate, it will be a subjugation. To avoid such a subjugation, we need a kind of power transfer. In other words, partnership should be based on openness and trust, while managerial aspect is just a kind of supporting one'*[6]

If looking at the governmentality, there is an issue of power, even though it is not in the form of violence. The organizational dimension of partnership is often to be a stumbling block of synergy between the church and government. If it is only emphasizing one dimension of partnership, for instance, the dimension of relation and ignoring the organizational one, it will not bring about the good development for people; and corollary, if it pays attention only to the organizational dimension, there is possibility to do a kind of violence, because the good governance is imposed. Both dimensions must be paired when the church is going to make a synergy with government to support people in achieving the good things.

What more to think is the position the church should choose when making a partnership or synergy with the government. The church will choose being the programme implementor or as a mediator of the development—and the community as the implementor of development programme. In context of synergy, at least there are three parties which complete one another when making a partnership; and there are two points of meeting between them: partnership and participation. The first point is engaging the church—as intermediary, and the government (donor); while the second is with recipient/beneficiary of the development (**Figure 1**).

[6] Interview, AT_Sdk.

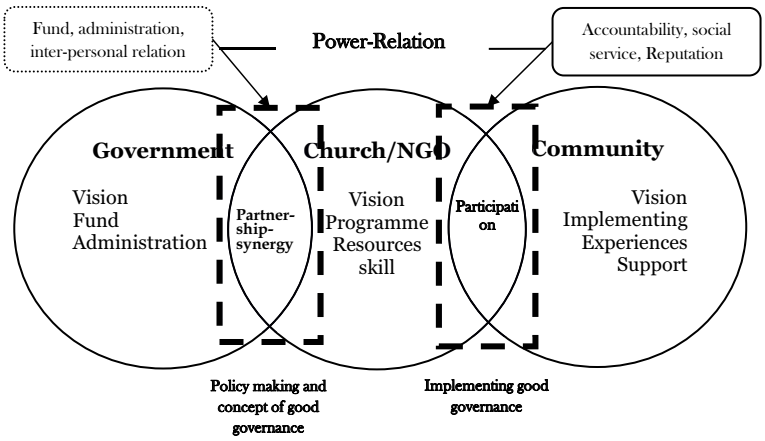

Figure 1.
Partnership synergy and power relation.

Besides the issue of position, something that is important to consider is power relationship among parties involved and shaping the synergy partnership. When the government as donor makes a partnership with the church, it will be possible there is a power balance; as the church has no vested interest upon the development fund, so the church has no ambition of political power. However, we must criticize another interest that might be rising among people within the church; if it happened, the partnership is instrumentalist for them, and the principle of good governance is not taking place, and eventually, community could be the victim of partnership: there is no participation due to people being merely instrument of the church in the political game of development.

What no less is saddening is sometimes the church and community make a collaboration to undermine the government authority. Then, synergy partnership is coming to an amorally and fugitive conspiration for the sake of the church authority. Religion is a kind of political commodity, and it will be a politization of religion. Participation is changed into mobilization and people become 'missile' for the church's vested interest and elite. The principle of good governance is not implemented. If such a thing is taking place, democracy is not growing, and freedom is turning into a meaningless party.

The best position for the church in making synergy partnership is in between the government and community—it could give rise to a participatory development. In this position, the church can play a role as prophet as well as the good patriot for the people. As a prophet, the church could be a moral guardian and speak out the critical voice to the government that does not practise the development properly. And at the same time, it will be an advocate for people who undergo repression or subjugation. Accordingly, the church will be able to rise up and encourage people participation in development, so by doing this people are empowered to be the responsible and good citizens.

A strategic partnership might be representing the best synergy in doing development; by doing such a partnership, what they discuss and do is the comprehensive programme to answer the issue of poverty and humanity.

> *'The issue of poverty and humanity now is reaching out inter-region and inter-nation. Accordingly, the partnership today is no longer carried out based on the project, or issue-based only. It needs a new partnership that is a strategic partnership'*[7]

[7] Interview, STS_Mdn.

To implement the concept of strategic partnership in practice, at least, there are three models that church could develop: first, cooperation, it is a basic and simple or minimalist partnership: it was not accompanied by creating a common vision; only shares information; and authority is on each organization that makes a partnership. This kind of partnership is manifested in a temporary activity, for instance, when facing a flood or natural disaster; each organization shares and contributes what it has, food, medical or labour to do a programme of flood emergency.

The second model is coordination; it is rather an intensive relation as there is a demand to shape a formality: mission is to be discussed and agreed openly, there is a collective planning and sharing the role; and each organization still has its own authority, but there is a risk taking commonly; resource, for instance, finance, is to manage together, as well as if there is benefit, it is to be managed commonly. The form of this model is manifested in the establishment a forum or a foundation that serves or focuses on the legal aid for migrant worker, for instance. This forum is an amalgamation of several ideas that had been discussed; then from discussion there is a collective mission, and it subsequently breaks down into organizational structure and its programme.

The last is collaboration, it is a kind of profound and trusted partnership; by doing this partnership there is a bounding or commitment of one and another: there is a new structure that set up together—even though it is separated from each organization; there is joint or common vision and mission; there is a common planning that made it comprehensively together; on each level of organization, all information is distributed and shared openly; authority will be decided by new structure that set up together; there is commitment to bear a risk together and openly; resources are to be managed together, and products are to be distributed openly to each organization (**Figure 2**).

The model that would be implemented by the church is depended on the context and issue they are facing, because each model bears risk that should be taken on. Commitment, engagement, sharing of resources are important aspects that need to be considered. The more to choose the higher model of partnership is the more commitment, engagement and resources are needed, included its risk. However, all these are well taking place if good governance is well implemented. Unfortunately, the aspect of good governance is left behind or abandoned, so that the partnership is coming to the transactional processes, and eventually, partnership is just beneficial for parties involved, while people who should be beneficiaries are ignored and remain as a victim of partnership.

However, to reaching a collaborative model of partnership, there are several obstacles to overcome.

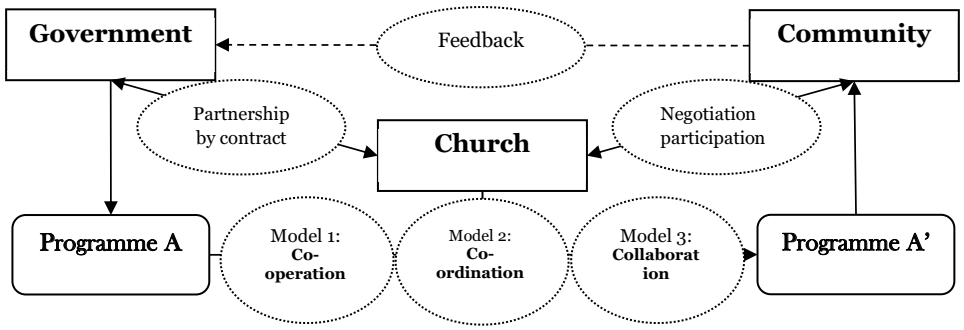

Figure 2.
Some models of partnership synergy.

In this context, the dimension power of governmentality is possible to come up. In the management of partnership often there is a potency of power, in which fund and knowledge are to be a sensitive issue. As always, those having resource of power can determine the approach or value that they promote and implement in the partnership. In the collaborative model, one party can share human resources and other raw material, while the other can share fund, knowledge and technology. There are two impacts, the positive one is social change and systematic development, and the other side is economic, social and political hegemony that if not paid attention seriously, it will give an impact that is the marginalization of the poor people by presenting new values of freedom, democracy, liberalism and capitalism that are oriented to those having capital and power.[8]

7. Entrepreneurship, development and the church-diaconal: the creative loving

If using sociocultural entrepreneurship to analyze what have been described above in detail, the church has potency to implement community development with diaconia approach or involved religious values in shaping development mentality or entrepreneurial character among the church and community members. For instance, the belief in a Kingdom of God, where the final end is justice and prosperity, is reflected in terms of cultural values, such as hard work, discipline, open cooperation and appreciate others; by doing such a reflection, it will find that Kingdom of God is a kind of *topos* or location where to embody social justice and prosperity, it needs hard work and discipline and mentality that every person should be respected or appreciated whatever they have, either physical capacity or another tangible skill. If such a thing is well taking place, the core theological principle of the 'entrepreneurship for holistic transformation' based on Kingdom of God is really a thing and not merely a discourse.

In addition, if using theological perspective and transform into social, open, just and loving relationship, it can be a starting point. In this context, the relation between diaconia and entrepreneurship is possible to meet each other. Diaconia is based on the love or compassion, and this kind of love, to avoid romanticism, should be dialogized with other values of social and cultural, to create a self-dignity. Encountering between diaconia and entrepreneurship results in a Christian-based social entrepreneurship that is an expression of the creative loving. This model intended to offer a new kind of loving relationship that empowers people to do creative works to reach self-independency and dignity in the name of faith.

Both models, social diaconia and religious entrepreneurial activities, are possible to implement in practice. In this context, religion is able to give a positive-critical meaning of the developmental processes: from planning to evaluation. Employing Christian-based social-cultural entrepreneurial, the practice of community development is a practice of social diaconia of the church. It means, the church does not let the development process without her 'intervention', due to the development seen as diaconia service of the church to confess her faith. Accordingly, social diaconia is not merely love-charity service, but it should be able to build people awareness to express the creative loving for social justice by creative participation in the development.

Such a practice of development must encourage the church as a mediator between government and community to implement the participatory development for the sake of social justice and prosperity. Participatory itself is rising when

[8] Interview, Wd_Mdn.

people have a mentality of subject of being, by entrepreneurial programme, either accompanied by social or cultural approaches.

To make it clear the role of social and cultural entrepreneurship for developing community, the effort of local church and its pastor to build an economic institution is here presented as a model. Living among the church members are relatively poor as well as the community members, the church seeks to find both theological thinking on economy and proper instrument as a means of prosperity. Due to the historical trauma on the cooperative, the church does not want to revitalize it. Discussing the theological and practical aspect of credit union (CU), the church supports the pastor initiative to set up CU as new economic institution for the church and community members. To develop entrepreneurial character or mentality among people, the church builds social-theological foundation: (1) theological piety must be embodied in economic piety, and (2) management of mammon; for the last idea, pastor said: 'If we ourselves are not able to manage the earthly mammon, how we can manage another thing?'[9].

Both theological foundations are not emphasizing on 'money', but on the stance to and management of money. To institutionalize both personal stance and management, it needs an organization; and then CU is to 'transform' the negative nuance of cooperative in the past. Shortly, CU is a fellowship to institutionalize the positive stance and outlook on money, and it intended to materialize the common welfare.[10] Additionally, what important is the character changing that brings about a new paradigm in looking at money and wealth, as expressed:

> *'CU emphasize the life is mutual helps and solidarity. This was to be possible because of the system of CU that is help others to help ourselves.'*[11]

Transformation of the idea of cooperative that in the past had negative nuance into CU is a reflection of cultural transformation of entrepreneurial mentality. By doing such transformation the church has promoted a thorough community development. Furthermore, looking at the success of this CU, the local government has offered a collaborative programme: CU will be an official instrument of poverty alleviation. The transformation process of CU is also an explanation that the entrepreneurial changing of mentality had given positive contribution to the development in community. Because CU now is reaching out to members in community and not limited only in the church. 'Through this CU, we feel that Christ is not far away and flee from the social problem', pastor said:

> *'The more the CU member's welfare is increasing there is an impress that Christ is for all people. Or Christ is working in and through the church so that other people are given the served that has been done. It means, Christ is not serving for the church member only, but the other people also.'*[12]

The good the church is, the church that continues to do public service for common good or *bona ecclesiae* ([29], 100). Such a church is the church that able to transform itself and then subsequently adapt to its community, so there is no gap between both. Only, by doing such thing, the church could engage itself into the development; and eventually, the church could generate the participatory development, as the manifestation of social diaconia and doing service not just for

[9] FGD, FN_100616.

[10] Interview, FN_100616.

[11] FGD, FN_100616.

[12] FGD, FN_100616.

charity-loving but creative and social loving. Such development is as Christ incognito present into the human life, transforming and transferring the redemptive life for the world.

8. Concluding remarks

The church as religious and social institution, in the context of Indonesia, a country that is doing a massive development, has a task that is not easy to do. It is not a state-church, the Indonesian church must do creative thing to develop community for the community and the church members as well. Also, it is not supported by sufficient fund, particularly from the members, the church should look for another source of fund to empower people surrounding.

In doing a community development that is giving a positive impact to its members, the church implements partnership with the government. By doing such a partnership, the church is able to empower people; and to continue the development sustain, entrepreneurship is applied as a means of completing it. Through the partnership the church is facing a problem of the limitation and power relation. In seeking to overcome the problems that are possible rising, the church attempt to implement a good governance. Developing trust, making a good communication, negotiation and complying with the items that are drafted in the contract are some managerial actions as a faith expression that matches with the concept of good governance.

By tracing the history of the church by life span of the pastor and some young people involved in the developmental practices, we found that good governance is a meaningful point of reference. Good governance is interpreted by them as an expression of faith as well to erect an open and equal partnership with government. Once the developmental programme secured, the church implements a socio-entrepreneurship to empower both the church and community members.

To make a partnership is a difficult thing; therefore, the church should be able to navigate, so it will not be entrapped into the government manipulation, or the church is instrumentalist in the development processes. Developing the dimension relational and organizational of partnership has made it possible for the church to do synergy with the government. Being synergy, it means the church could be equal partner of the government in doing community development. Accordingly, engaged in such a process, the church has an opportunity to witness the world that the community development is a manifestation of the social diaconia. It is oriented to public service, social diaconia of the church is to intend to create a common good, *bona ecclesiae*, where the wealth is to be managed, developed and grown to help the poor. Eventually, to support the development sustained in the community, the social diaconia is implemented by entrepreneurial approach. All these are carried out in the social and cultural perspective, so that the programme of community development of the church is a combination of empowerment and entrepreneurial activities, and it is expected to be a witness that the church is as Christ had present incognito with people to transform them together and participatorily. This is a model of the development that the church should conduct in Indonesia today to achieve a common prosperity. [***].

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Chapter 22

Cultural Heritage Tradition and Innovation in the Internationalization of Family Business: A Case Study from the Italian Fashion Industry

Anna Claudia Pellicelli and Erica Varese

Abstract

The fashion industry is one of the main businesses in the global economy in terms of employment, investment, trade and revenue and Italian companies are worldwide recognized as representative of cultural heritage, expertise and high-quality standards. The adoption of traceability technologies, such as Radio Frequency Identification (RFId), from the very early stage of the production chain, may help to obtain a more effective process and may also assure the origin of the garments, a key aspect in the fashion industry. The chapter aims at presenting an Italian family business, Oscalito, which has adopted the RFId technology, joining tradition and innovation in its production. A qualitative case study methodology has been adopted, to explore this experience within its context. Oscalito has applied RFId tags to each label, to ensure complete traceability throughout the production chain for each single item (and not merely by lots), fine-tuned control over the production process, and timely and accurate shipment. Thanks to their application, the production chain has been monitored and the Italian origin of the garments has been guaranteed. This research has undoubtedly some limitation due to the applied method. Deeper studies are requested in order to check a general fashion industry trend with reference to the application of RFId technology.

Keywords: Heritage, Country of origin, Radio Frequency Identification (RFId), fashion industry, family business, case study, tradition, innovation, internationalization

1. Introduction

The importance of the consumers' perception of the country of origin, which is a strategic aspect for the Italian fashion industry, dates back to the first decades of the XXth century. In fact, a first set of studies addressing the perception of the countries can already be found in the 1930s and 1940s [1–4]. Since then, the fact that country images are both the cause and effect of social as well as psychological processes, together with the multitude of their possible economic, cultural and political effects, have led to various studies across a range of scientific fields.

From the perspective of business studies, different concepts have been developed in the subfield of marketing with a focus on nation brands as well as country of origin effects: country of manufacturing [5], country of design [6], country of brand [7], country of origin image [8].

In the field of communication management Passow et al. [9] and Yang et al. [10] applied a model focused on corporate reputation in analyses of country reputation. Buhmann [11] applies the 4D model to analyze image transfer and halo effects between companies and their country of origin.

To assure the exact country of origin of a product and also to consider other strategic issues such as the prove that the garments are not counterfeited, business operators of the fashion industry may adopt recent technologies, such as RFId tags.

The aim of this study is to present a case study in the fashion sector related to an Italian family business. One of the key elements of this company, Oscalito, is undoubtedly the link between tradition and innovation, the latter realized also thanks to the use of RFId technology.

Oscalito has been preserving and defending an authentically Made in Italy supply chain for 80 years and its clothing line is closely related to Italian tradition of high-quality standards.

Oscalito, established in 1936, initially created clothing lines of underwear and fashion knitwear for men, women and children, using high quality natural fibers. After the disasters of World War II, in a building located in Torino (Italy) alongside the Po river, the Casalini brothers (Osvaldo and Lino) set up two knitting machines that had survived the war and started production again, in a country where reconstruction was enthusiastically underway. The logo of the company is shown in **Figure 1**.

Figure 1.
Oscalito's logo. Source: Oscalito.

In 2012, Oscalito started the use of RFId tags, linking the tradition in quality of their outputs with innovation and technologies.

This study, which is part of a branch of research (fashion industry and new technologies) carried out by the Authors [12–14] fills a gap in the literature: to the Authors' knowledge, this is the first paper which presents a case study of an Italian family business company able to joint with success tradition and innovation technologies.

This chapter is divided into 4 sections: Section 2 presents the research methodology; Section 3 is focused on Oscalito, the case study, while the final conclusions are drawn in Section 4.

2. Methodology

With the aim to realize the objective of this research, the following hypothesis has been developed:

H1. *The Italian fashion industry pushes for maintaining its tradition while using innovative tools to guarantee the origin of the production and protecting it against counterfeiting. RFId tags allow both the above-mentioned objective to be attained, while pursuing and enhancing aspects of the company tradition.*

The Authors decided to apply a qualitative case study methodology for exploring this experience within its context [15, 16]. As stated by Yin [17, 18], the selection of this method is justified because there is the necessity to answer "how" and "why" and furthermore because the Authors are not able to influence the conduct of those involved in the research. Last, but not least, the study is focused on an up-to-date experience.

The Authors have chosen Oscalito company to focus their research because it is a pretty unique case [17, 19, 20]: it has maintained a strong tradition while innovation technologies have been introduced to monitor all the supply chain.

With the aim to deeply investigate this case study, a large variety of sources of information have been used.

As this research has been realized during the COVID-19 pandemic crises (October 2020), the data triangulation suggested by Eisenbardt, [21] was realized with some adaptations due to the current situation: it was obviously not possible to conduct a direct observation in the company buildings, but Authors were invited to some online meeting to have the opportunity to observe the company behavior in real time. A lot of time has been dedicated for the analysis of company documents (reports, studies, memoranda etc.) and interviews (the managing director and other people in the company) thanks to online meetings with video and screen sharing. All these actions allowed the Authors to deeply examine the company.

Each interview lasted for approximately 45 minutes and was conducted by both Authors.

Further information was collected from the company website.

All the collected data were analyzed autonomously by the two Authors and then compared.

In accordance with Ying's categorization of case studies, this is a "descriptive" one: it defines a "phenomenon and the real-life context in which it occurred" [16, 17].

3. Case study: Oscalito

3.1 Company core values and positioning

The beginning of Oscalito's production was basically characterized by use of tubular fabric (without stitching), using circular machines. Lino's sons, Arrigo and

Andrea, later joined the firm, extending the product range to fashion clothes and gaining success even on foreign markets: today a total of 60% of its revenue comes from exports.

Andrea began to experiment with designs on wild and pattern textile machines and with new yarns and fashion garments, broadening the range to more fashionable items. His innovations found favor on the USA market, while orders, commitments and production took off.

In 1975 Arrigo joined the company, giving a fresh boost to sale and the following years were marked by constant growth: women's fashion items began to play a central role as the export market became increasingly important. Oscalito is a family-controlled business as Casalini family has more of its members in key management positions [22, 23].

The role of entrepreneurship and the culture for facilitating internationalization efforts is clearly powered at Oscalito and ensures a company's long-term competitive advantage: most business originally begin as family business then evolve into larger business, depending on performance [24].

While Oscalito constantly innovates, it remains true to its core values: turning out first-class garments meant to be worn next to the skin, using natural fibers relying on an entirely Italian supply chain. The narrow space between skin and undergarment determines the comfort; this microclimate's temperature and humidity is kept in perfect balance by living natural fibers. These react with the external environment just as they do in nature, absorbing or releasing heat and water-vapor molecules. With synthetic fibers, which are non-absorbent, moisture remains on the skin.

In 2014, the third generation joined the company as Dario Casalini, gradually took over the reins in a spirit of continuity, refreshing the brand while expanding onto the international market.

The positioning is the result of the company intention to offer superb comfort, quality, well-being in a unique, original and recognizable style [25].

3.2 Oscalito's use of RFId tag

Nowadays, RFId technology is commonly used for monitoring food [26] and non-food products.

In the textile sector the implementation of RFId technology is considered a huge prospective.

The literature, for instance, has put into evidence that a resource allocation system which uses RFId tags is able to ensure more effective processes than those realized by conventional procedures [27], furthermore, it has been demonstrate the positive impact realized along the supply chain thanks to the application of these tags [28].

Many brands (for example Tesco, Wal-Mart, Benetton, Prada, and, recently, Zara [29]) have already examined the implementation of this technology [30].

It is in this context that Oscalito, since 2012, has decided to adopt the RFId technology, which is applied to each label, to ensures complete traceability throughout the production chain.

This technology uses radio-frequency to recognize, find and trace things [31]. The company uses RFId tag for each single garment (and not merely by lots): this allows fine-tuned control over the production process, and timely and accurate shipment.

Additional considerations related to RFId technology for monitoring the supply chain and for fighting against counterfeiting may be found in this already published chapter [14].

RFId technology has emerged as a valid support for the company not only to monitor the supply chain, but also to protect the Italian origin of production, improving the link with the company's tradition.

In the next paragraphs, further suggestions about the company's use of RFId tags will be provided.

3.3 Competition analysis

Upon analysis of the industry using the Porter's Five Forces Framework [32–35] Authors may affirm that competition within the industry is very high due to the number and the different purposes of competitors, and that the competitive pressure especially derives from chains and department stores.

Oscalito exports about 60% of its products, therefore its main competitors are foreign companies such as Hanro and Zimmerli, which manufacture in Switzerland.

Its suppliers have a high bargaining power, in that Oscalito – to maintain the same level of excellence of the natural fibers and Made in Italy mark – sources extremely high-quality raw materials from a very restricted niche of suppliers.

Its customers also have a high bargaining power due to low switching costs that push them to spend less money on underwear products by purchasing from competitors that produce low-cost products and sell them at accessible prices.

Barriers to entry are high – due to the sector's high competition level – with the only relevant threat being the recent emergence of e-commerce underwear companies attempting to enter the sector. The threat from substitute goods is low, but the high quantity of competitors does offer numerous alternatives to Oscalito products.

Hanro and Zimmerli and all others direct Oscalito's competitors do not' use RFId tags: without the application of this technology, the supply chain and the subcontracting (for instance those linked to East Europe, Portugal, China and India) are not put in evidence.

RFId tags may be considered as a competitive advantage only for the retailers receptive to the "Made in" topic, which, nowadays are still a tiny minority.

3.4 Value chain and success factors

The source of Oscalito's competitive advantage lies in its differentiation [36, 37], allowing the company to impose a premium price thanks to the high fiber quality, product excellence, and Made in Italy mark.

Customers are willing to pay a premium price as they can perceive the higher quality offered by the company as opposed to its competitors.

Another source of competitive advantage is the product innovation pursued through use of tubular machines (**Figure 2**), allowing the company to produce seamless knitwear.

RFId technology enable consumers to be fully informed on the origin of the products and protect them from misleading indications of origin.

As well as its differentiation strategy, Oscalito also pursues cost advantage, especially by means of process innovation. Its slow production allows close control of the vertically integrated supply chain. Moreover, it achieves cost reduction through innovative use of RFId tags, which allow tracking of every single item of clothing throughout its entire lifecycle, all the way to its sale to the end user, thus a guarantee of full traceability and extensive control over manufacturing and shipping. RFId is useful for monitoring supply chains and as tools for fighting against counterfeiting [14].

Upon analysis through Porter's Value Chain, one may comprehend the uniqueness of Oscalito products, and how the company manages to turn input to

Figure 2.
Tubolar knitting machines. Source: Oscalito.

high-quality output by means of vertically integrated activities within a fully Made in Italy supply chain.

The production phases range from yarn spinning to the finished product: weaving, fabric finishing, cutting, sewing, finishing of the end product, quality control, and warehouse logistics.

The initial phases (weaving and fabric finishing) are performed using bar codes, bearing all the information related to the manufacturing steps to make the finished product; such data is then transmitted via the RFId antenna. In the cutting phase, the cutting slip includes details of the fabric bolt or bolts, and the sewing slip includes bar code details related to the bolt, the cut area, and the Bill of Materials, which also includes the past details related to the bolt, the cut area, finishing, and origin of the thread.

When the item is complete an RFId tag is applied – containing the above information – in that, until that moment, it is simply considered a unit of production. Upon application of the tag, the logistics history of the item becomes independent and contains data related to shipping, recipient, store to which the product is shipped, and quantity sold (only for wholly-owned stores and franchisees).

Figure 3 shows some crucial phases of Oscalito's production.

3.5 Marketing activities, distribution, and network

Oscalito's levers of success may be identified upon analysis of the marketing mix.

The brand's products are made of extremely high-quality natural fibers, and the slow production philosophy preserves such quality and guarantees maximum wellness to its end users.

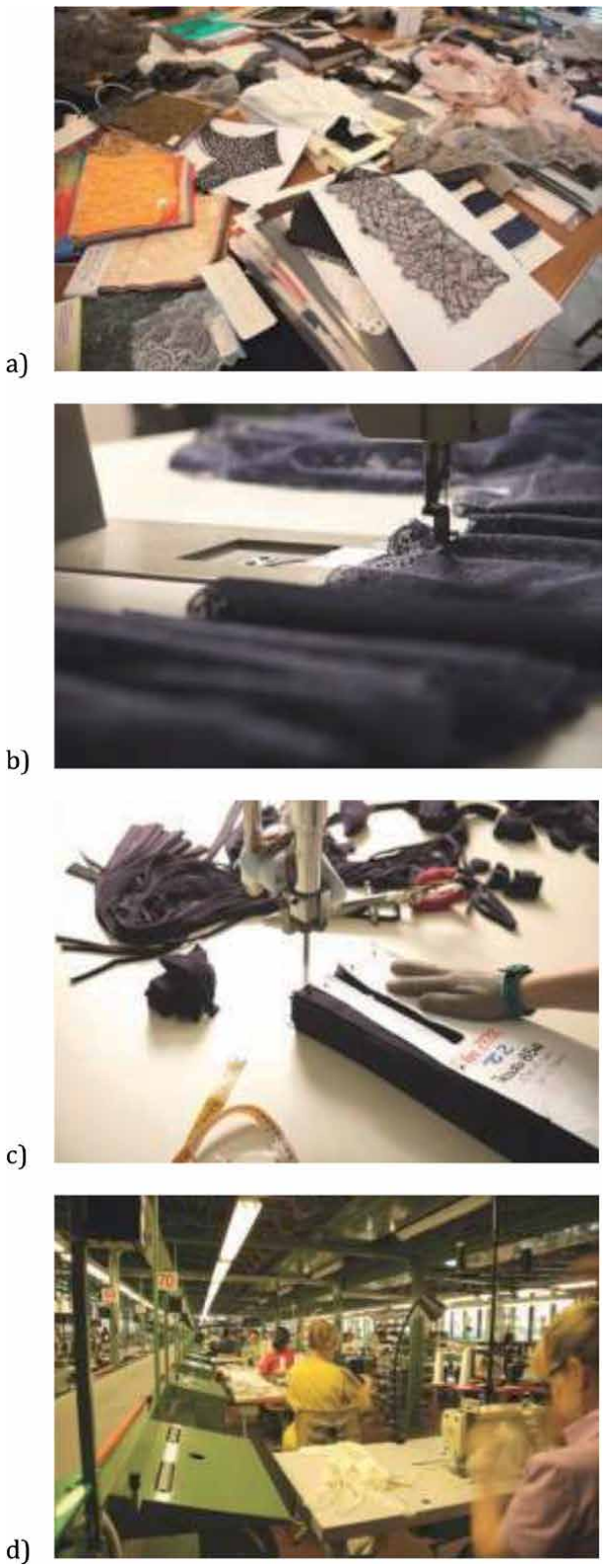

Figure 3.
Some phases of Oscalito's production. a) Design and prototyping; b) lace cutting c) rib fabric manual catting d) sewing line. Source: Oscalito.

The premium price applied to the goods is justified by their quality level, and consequently the customer perceives an excellent value for money.

The promotion and communication policy are mainly based upon the Made in Italy mark, and Oscalito transmits an image coherent with its brand values through elegant, refined, and neutral-colored retail outlets.

The products are distributed to a number of countries through independent agents, distributors, monobrand stores and – in certain countries – the e-commerce channel.

The vision is to wear 100% Italian, high-quality underwear or knitwear.

In order to compete with the players in the fast fashion business – offering the same functional benefits as Oscalito – the company needs to leverage its social and emotional unique selling proposition, making consumers conscious of the greater benefits that purchasing Oscalito products may imply.

Elegance-conscious consumers with a middle-high income experience a feeling of great wellness offered by the natural fibers that preserve the necessary microclimate for maximum comfort.

Oscalito stands out from its competitors due to the raw materials and manufacturing technology it uses to create its products, with a constant commitment to investigating new styles and developing new production methods in line with environmental responsibility.

At the end of the year 1990, the company created a sorting system for processing stations based upon an IT system: each processing station is automatically distributed by a CPU to the various processing machines. After the sewing phase, each item of clothing undergoes quality control (**Figure 4**), which allows only 1% of company products to go to waste.

Since its establishment and until the 1980s, Oscalito had a single sales network: independent agents (as the company did not have the necessary turnover to hire exclusive agents) who also sold complementary products.

In the fashion industry, the evolution of the supply system has had a strong impact on the market.

From the business point of view, regardless of the size, management of distribution channels is a crucial element that may determine the success or failure of the firm itself. Within such sector, manufacturers and large brands offer a value proposition that depends on the combination of physical traits of the product but also its related intangible elements and services [38].

Oscalito has recently opened an e-commerce platform in the United States.

When a sales network is deeply enrooted in a Country, it becomes dangerous to launch and e-commerce platform, in that other retailers view it as a direct competitor. This danger exists both in Italy and France, where the retail network is deeply entrenched. Launching an e-commerce platform also implies an increase in stock and in investment in logistics.

a)  b) 

Figure 4.
a) and b) quality control on shaping lamps. Source: Oscalito.

On average, in the clothing sector 12% of turnover is spent on marketing. Oscalito, instead, spends 1%. In order to compensate such lack, the company has adopted a number of solutions: seminars for retailers in Italy and France; and industrial tourism, namely visits to the company. The problem is that it is crucial to the company that retailers inform customers about the Oscalito production process and product.

Oscalito belongs to company networks that offer promotion of the brand through free-of-charge advertisement, namely Italian Lingerie Export and Exclusive Brand Torino. Italian Lingerie Export is the consortium bringing together Italian companies that manufacture high-quality lingerie. Exclusive Brand Torino is the consortium for the promotion of selected brands and top products from the Piedmont area on the foreign market, whose member companies share a set of values, such as attachment to the territory and excellence. Nevertheless, the consortium's multi-sector nature is also an obstacle, in that it struggles to offer common initiatives.

Since now, Oscalito has not implemented marketing strategies for consumers focused on the application of RFId tags even because, from the company point of view, it is not easy to choose which are the appropriate information that can be given to the consumers. It is crucial not to benefit competitors (for instance, indicating which material allow to obtain a certain high-quality) or to avoid creating problems to the retailers (the indication of the date of production may reveal the consumer that the item has been stored for a long time).

3.6 The international market: advantages and critical aspects

Countries offering the greatest opportunities in the fashion industry are developing countries such as China, India, and Japan.

An additional market that has recently gained high relevance in the sector is the Iranian market, especially in terms of luxury European brands, due to the abolition of economic sanctions and consequent facilitation of luxury brand import. Ever since the 1970s, Iran has suffered enormous fines introduced after the Khomeini revolution. Sanctions were renewed in the following decades due to human rights violations and the development of nuclear technology. Furthermore, it is estimated that the average expense per capita on underwear will increase by a considerable margin in the next few years. Until 2016, Iran faced a trade embargo, usually eluded through contraband imports. Despite this, upon the end of the sanctions a great customer pool has developed, fast-growing and including young consumers.

Moreover, the Iranian market was historically linked to Italy and responsive to the Made in Italy mark.

At the moment, small and medium retailers dominate the market but shopping centers are growing exponentially. Such growth is due to the fact that Iranian consumers associate European and US products with a high-quality level.

The fast growth of the underwear market in developing countries is also due to the fact that women are gaining the willpower to show themselves in public, and are expanding their perspectives in terms of acceptance of underwear, dedicating more and more time to its purchase [39].

The Asia Pacific market (China, Japan and South Korea in particular) and the Indian one are the market growing most rapidly. The transition in consumer lifestyle, supported by growing urbanization and buying power, is the main cause of this [36].

The methods Oscalito uses to choose its distributors and retailers are the following:

- Product placement, which must be adequate, not only in terms of price (Oscalito products belong to the high-end market), transportation, and

customs charges (particularly high outside of Europe), but also in terms of the ability to maintain a product placement that is suitable to the brand image;

- Reliability of the distributor in financial terms, in that the Oscalito supply chain is very long, thus a canceled order is a relevant issue for the company.

- The ability to describe the product, which must be very strong. The distributors and retailers shall have the skills and motivation to describe the product to the end customer.

The future of distribution within the analyzed industry appears to be organized retail, where the brand is provided to the retailers who each have their loyal brand or pool of brands. Nevertheless, market growth also includes online stores.

The Oscalito brand does not only represent high quality and excellence through slow production, but also represents Made in Italy.

Made in Italy is one of the bestselling global brands and is linked to positive values such as creativity, esthetics, quality, and attention to detail. It has become a synonym of "knowing how to make things well", and is an added value to our production system: basically, a collective asset [40].

Upon analysis of such data, the Authors may firmly state that the European and US markets have a high level of attractiveness and competitiveness, thus it is worth maintaining corporate presence within such markets.

The problem of counterfeiting and imitation is an issue that starts above all from China, jeopardizing brands image and offering fake products which brands need to be protected from. Every day there are attempts by China to register the brand and, in relation to a particular case in which the Oscalito brand has been filed on non-clothing classes, the company attempted to appeal but the transaction was not successful and further costs would be incurred.

Fighting against powers such as China at a local, or national, level is quite difficult, expensive and disadvantageous.

Traceability obtained thanks to RFId tag is very appreciated abroad but sometimes the market requires other appropriates certifications: it is for this aim that Oscalito has the Italian Identity Certification [41]. which covers the whole supply chain and very soon it will be certified also Tessile & Salute [42] (Textile and Helath).

4. Conclusions

With reference to the fashion sector, the objective of this chapter was to verify the possibility to guarantee the origin of the production of an Italian family business and the protection against counterfeiting while pursuing and enhancing aspects of the company tradition also linked to the Made in Italy concept. It has been stated [43] that the concept of made in Italy dates back to the 1970s and identifies the Italian garment with "some examples of innovations in design and history that maintain and reinforce the high levels of Italian craftsmanship, attention to detail, beauty, and cultural heritage, the values that define the Italian character and style at its best". As a kind of loop, the heritage, as well, enhances the [44] contemporary Italian fashion.

Some Scholars express some criticisms about the case study method, as it is not rigorous and, as it is focused only on a single case examination, it is difficult to get a generalizing conclusion. Even if these above-mentioned issues are generally accepted and are definitely critical aspects, the Authors of this chapter trust that

through the evaluation of Oscalito case study, they have been capable to describe how innovation, mainly represented by the application of RFId tags, has been capable to guarantee the origin of the production and to ensure the transmission of traditional characteristics of the company.

RFId tags guarantee a full traceability and an extensive control over manufacturing and shipping.

Thanks to the implementation of RFId tags along the supply chain, Oscalito, as a proof of excellence, has earned the Italian Identity certification issued by Italcheck, as well as the "bestseller" award by magazines specialized in underwear.

Other consideration is that this research has been realized during the COVID-19 emergency and, as it is not predictable when it will be solved, most of the above-mentioned thoughts may be reconsidered in light of the ongoing of the global pandemic crises.

Oscalito, during these months, has immediately reinvented itself and decided to contribute to the fight against the Coronavirus by converting some line producing masks. Great quality, despite all the economic damage suffered, even without the necessary aid and due, has succeeded in creating a new product, absolutely innovative, produced designed and packaged entirely in Italy. Also this product has a supply chain with an almost total sustainability and transparency content. These masks are "*medical device CE certified (surgical masks Type II registered with n.* n. 1955886 and 1955920*) in pure Egyptian cotton jacquard fabric with lateral adjustable drawstring, elastic for ears and bottom opening to refill disposable SMS40 filters. The ideal solution to combine safety (certified medical device), health (breaths in cotton and not in plastic), environment (removable and recyclable disposable filters) and savings (the filter is much less expensive than a disposable medical device)*". The mask is also CE patent pending.

This research has undoubtedly some limitation due to the applied method as it has been adopted a qualitative methodology for a single case study. Deeper researches are requested in order to check a general fashion industry trend with reference to the application of RFId technology.

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Conflict of interest

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Other declarations

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Chapter 23

The Movable Heritage of Drăghia

Patricia Săsăran, Ancuța Țenter, Bety Burghele, Marin Coteț iu and Loreley-Diana Jianu

Abstract

The movable heritage of the Drăghia village, Maramureș County, is still around today thanks to a handful of people who diligently tended to the aged objects forsaken long ago. The old wooden church, built in 1706, is today a museum in which some of the age-old ritual objects, as well as other type of objects, are conserved. The decorations of the church, an important aspect over time, include various objects which today can be considered movable heritage. In this regard, the icons or paintings were highlighted by decorating them with decorative towels, woven by the village's women. Other cloths, rugs and mats were also used for „dressing" the church. We will open the list of movable heritage objects with the key to the church, and tell its over 300-years old story. The icons, religious books, royal doors, banners, thurible, the two choir pews, the church bells, and the priest robes will complete our study. On the other hand, you can find an old shirt, a towel, a bench or some other object kept out of respect for their ancestors in almost every house in the village. The Radu families have impressive collections, having establishes a so-called personal museum.

Keywords: movable heritage, church, religious books, key, icons, table cloth

1. Introduction

Patrimonial artifacts of Drăghia Village, Maramureș county, exist today only through the benevolence of some people that are aware of their value and managed to take care of their family's heritage until today, despite the modernity taking over [1].

The village's church, built in 1706, has long developed into a museum, where one can have a glimpse of various objects used in old Christian rituals. Embellishment of churches was an important aspect in the old days. The icons and the paintings were framed and exposed with special handwoven textiles made by the women of the village. In the same time, carpets and other types of local made textiles were used for covering the floors or furniture in the church. Beside the church, almost in every house one can still find an old traditional shirt (ie), a hemp towel, a bench or several other objects kept out of respect for their ancestors' tradition. Most impressive are the collections coming from Radu family and Blenche family, that managed to create a small private museum.

The key, the icons, the old religious books, the altar doors, the church' flags, the censer, the two lecterns, the bells or the priest clothing will be part of our study.

2. The key

The first object in the series of patrimonial objects presented herein is the key of the wooden churches' front door. We'll take a moment to tell the 300 years key story.

The key from the old church is a specific one for the area. It is a long iron key, with a fixed part of 39 cm and a mobile part of 10 cm, acting upon a wooden closing system. An encrusted 19 cm wooden beam is set in motion by the key, therefore blocking the door. A mechanism that works flawless for more than 300 years (**Figure 1**).

Figure 1.
The key.

3. The doors

The main entry door in the church is made out of fir tree. Impressive about it is the painting of Michael Archangel on the exterior side. It is an advanced damaged

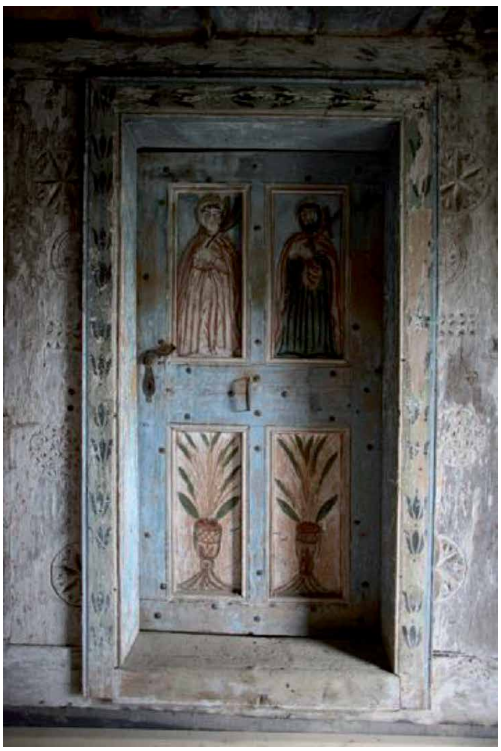

Figure 2.
The indoor door.

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painting, almost entirely faded, so one can solely see the contour of the eyes, the aura and the wings. Being outside, throughout the years, the meteorological phenomena took their toll on the majestic painting.

The wooden door inside the church marks the passage between naos and pronaos and it is an element that enriches, through its artistic value, the local patrimony [2]. It is made out of fir tree and painted on 4 levels by the local masters of that time. The dimensions are about 87/162 cm, with a depth of 6 cm. In the two sections of the superior level, we can see the painting of two saints, a man with a cross in his hands and a woman holding a twig (**Figure 2**).

The two characters have no inscription to reveal their identity. In symmetry, on the inferior level, we can see two identical paintings of the tree of life, with green leaves, coming out of a traditional pot. The frame that surrounds the paintings is blue and embellished with iron nails with very thick heads. The nails have a functional role (to sustain the wood elements that make the door) while giving great esthetic pleasure, through their order and design. In the middle of the door frame there is a simple iron handle, allowing for door opening. The handle is simple yet its shape and execution creates a beautiful ornament. The door jamb is painted in blue with black tulip motif all around (**Figure 3**).

Figure 3.
Framed around the entrance.

There is a solid wood doorstep as a part of the doorframe. The door was inserted in the doorframe after the church was constructed and it is framed around the entrance with several symbols often encountered in Transylvanian churches, such as rosettes, the seed of life, the quarter moon motif or Woolf teeth motif, having a protective role, but also the honeycomb motif within the rosette [3]. These symbols are in part covered by the doorjamb. On the inside, facing the naos, the door is unpainted. Might be because that is a side that never gets to be seen or just for the simplicity of the naos.

The doors that make the passing from naos to altar are attractive through their painting. We can see here the 4 evangelists on the lower side, and on the upper side the Annunciation Day (**Figure 4**).

The inscription marks the years 1773 and 1797, most likely indicating the time interval in which the altar was built. The Cyrillic inscription Ячасть помань а8 пльтйть Тома Опришъ шй соаца са Маріє шй [...], translated roughly as "1797 gift

Figure 4.
The doors that make the passing from naos to altar (royal doors).

made by Toma Opriș and his wife Marie with their sons Filip and Ștefan and sister Teodora Anisia. Painted by Petre", withstand the passage of time, remaining visible until this day. This inscription talks about the painter Petre from Preluca (his work can be recognized in various other churches in the area) [3] and the family that financially supported the work.

These doors were opened by many pilgrims and locals throughout the years and have collected the energy, good thoughts, prayers and hopes of all those that stepped in.

4. The lecterns

The lecterns, made out of fir tree wood, are the costume made, containing in one piece the chairs where the singers stay and a desk for supporting the books of the singer. They are and are positioned on each side of the iconostasis, in the naos. Above each lectern there is a small window, so that the light strategically falls on the singer' book (the church is not and has never had indoor electricity). The age of the lecterns can be established according to the painting on them. Two characters, a man and a woman, with a Latin inscription above, are painted on the left side of the iconostasis (**Figure 5**).

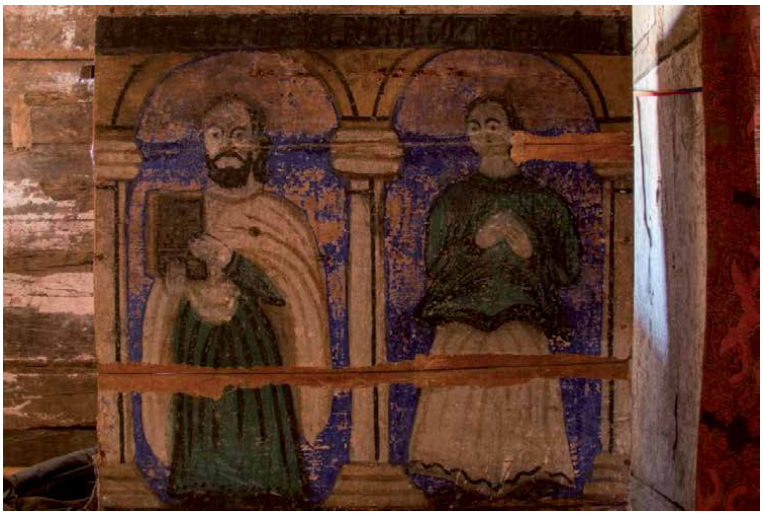

Figure 5.
The lectern.

All other inscriptions in the church are in Cyrillic alphabet, therefore this Latin inscription shows us that the lecterns painting is more recent. The text, "this lectern paid by me, Cosma Costan and the wife …" helps us date the donation through the parish registers. According to this, Cosma Costan and his wife, Sofia Rus, from the neighboring village Coroieni, appear in the parish registers of civil status as parents at the marriage of their daughter Terezia, being 45 and 40 years old [4]. We can therefore confirm that the church donation happened around the middle of the XIX century. The second lectern is painted in brown. There are traces showing that it formerly had an intricate painting, but at a later time, allegedly with the intention to be renewed, was covered with brown oil paint. Each of the lecterns has leather belts with

buckles on the sides, to maintain in a vertical position the support of the banners. The original blue painting is still visible under the belt of the left lectern (**Figure 6**).

Figure 6.
The leather belts with bucles.

5. The religious books

Most of the cult books belonging to the church are kept in the Museum of History, since 1977. Today we can find only two of these books under the churches roof, namely the Anthology (Antologhionul) and Cazania.

In the old days, the priests had only manuscripts for their religious rituals. Following the Guttenberg invention, books in Cyrillic language started to appear in the area. Our ancestors had a strong religious conscientious - we see this through the fact that they bought books for their churches, very expensive back then, some of the prices being as much as a good pair of horses.

- Octoih, Bucharest, 1730
- Cazanie or Kiriodromion, 1855 (belonging today to the church)

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- Evanghelic, Blaj, 1765
- Apostol, Blaj, 1767
- Penticostarion, Blaj, 1768
- Strașnic, Blaj, 1773
- Antologhion, Blaj, 1797 (belonging today to the church)
- Triodion, Blaj, 1800 (**Figure** 7).

The Strașnic from Blaj was bought in 1841 with village collected money by Corui Petru, during the period when Ilieș Toader was the main singer. The money paid was 15 zlots (foreign currency).

The Triodion from Blaj was printed in 1800. The writings "This holy book belongs to Drăghia church, bought by Pop Iosif, husband of much respected Tarța Irina, in the memory of their ancestors. January 1st, 1811." Whoever will steal it or give it away from this holy church, to be un-blessed by the 318 holy priests." can be found on its cover. On the cover of Antologhion is written: "belonged to Gherman

Figure 7.
The Triod book from Blaj.

Simion, singer in Rohia, which gave it to the priest Popa Ioan from Poiana Porcului, for 24 vonași" this priest later brought the book in Drăghia's church. The Apostol book, from Blaj, was a „gift of the lordly mercy of the Principe Iacob Anton, the vicar of Făgăraș episcopacy, for Drăghia church", as mentioned on the cover. In 1922, Radu Constantin buys the necessary Latin books, with the equivalent price of a cow.

6. The banners

The banners (locally named prapor) are religious items for processions or other solemn gatherings. They represent the divine power and are perceived as a parental protection which gives hope for people on this life on Earth. They are the symbol of a power army leaded by Christ and had the power to activate the community, in the different events that they were used. In the old church in Drăghia we can find two pairs of banners, a black pair and a dark-red one. The paintings on them represent faces of saints or scenes from Jesus's life. They are having the following components, from the top down: a wooden a piece of rectangular thick fabric on the lower side

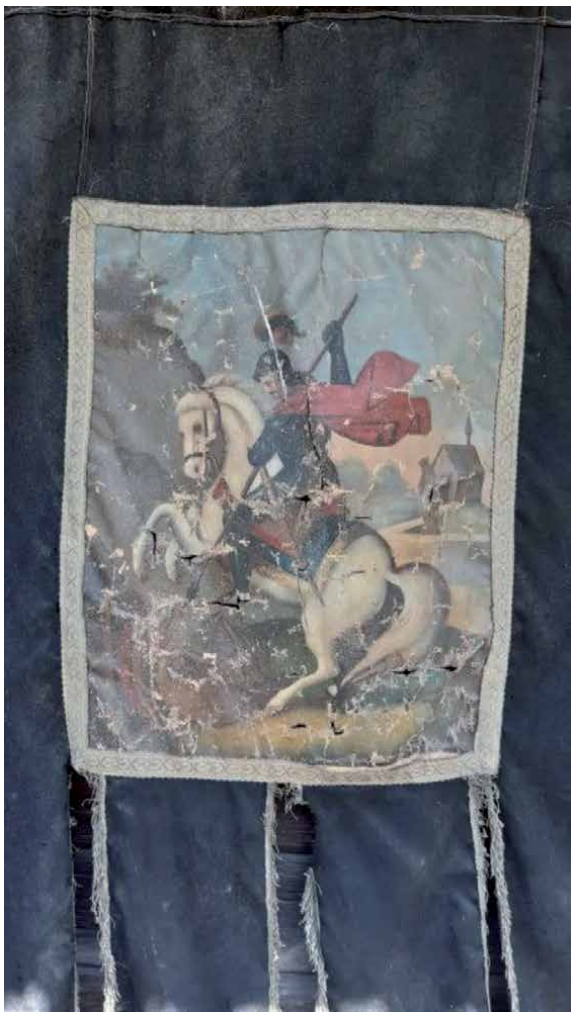

Figure 8.
The banner painted with Saint George.

being split in 3 parts and ornate with fringe, hanging from a thin wooden beam. In the middle of the banner, on both sides, features a 55x45 cm painting.

One of the black banners (whole size 79x120 cm) has the painting of Saint George on the horse, killing the dragon on the one side and the painting of Saint Archdeacon Stefan (the martyr killed with stones) holding a censer in his hand, on the other side (**Figure 8**).

The second black banner features the pained image of Saint Nicholas one side and the image of Saint Michael the Archangel on the other.

One of the red banners (74x145 cm in dimension) features the paintings of Annunciation and Saint Anne with Virgin Mary holding a child in her arms, while the second red banner is incomplete, the painting missing from the fabric frame.

7. The censers

In the church collection we can find also two old censers, undated. The censer is a ritualist artifact, made of metal and hanging in chains, for fumigation with frankincense (**Figure 9**).

Figure 9.
Two old censers.

There are particular moments in the liturgy when the priest uses this, going around the altar and church. The censers are made out of brass and have specific ornamentations.

8. The priest clothes

Other valuable objects belonging to the church are the priest clothes: one long black robe (reverend) and a brown color vestment article, embroidered with crosses (patrafir), dating back since 1950, are worth mentioning (**Figure 10**).

Figure 10.
Long black coat (reverend) and another vestment (patrafir).

Another patrafir, a long vestment article that is often hanged around the priest neck during religious ceremonies (the length is about 1.30 cm) is kept

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Figure 11.
Vestment (patrafir).

in the church. Is made of natural silk with very exceptional artwork featuring colorful flowers (**Figure 11**).

The vestment's age has not been assessed, but judging by the unique style (not at all common today), and by its degrading state, we can assume it dates back to the XIX century.

9. The icons

The icons belonging to the wooden church of Drăghia are today at the History Museum [5]. They were picked up together with the cult books in

1977. All that is left in the church today in the icon from the holy table, the altar table, representing a portrait of Mary, Jesus and Josef. It is made in oil on canvas, with a beautiful and simple wood frame [6]. As a style it follows a renaissance approach, the portraits are very realistic, and was probably brought in the church when Greek- Catholics religion dominated in the area (**Figure 12**).

Figure 12.
The icon from holy table.

The iconostasis presents on the lower level 3 frames made out for the most valuable icons belonging to the church, paintings that today sit in the History Museum: in the North, Saint Nicholas, in the middle Virgin Mary

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and baby Jesus, with guardian angels, in the South Archangel Michael, the protector of the church (**Figure 13**).

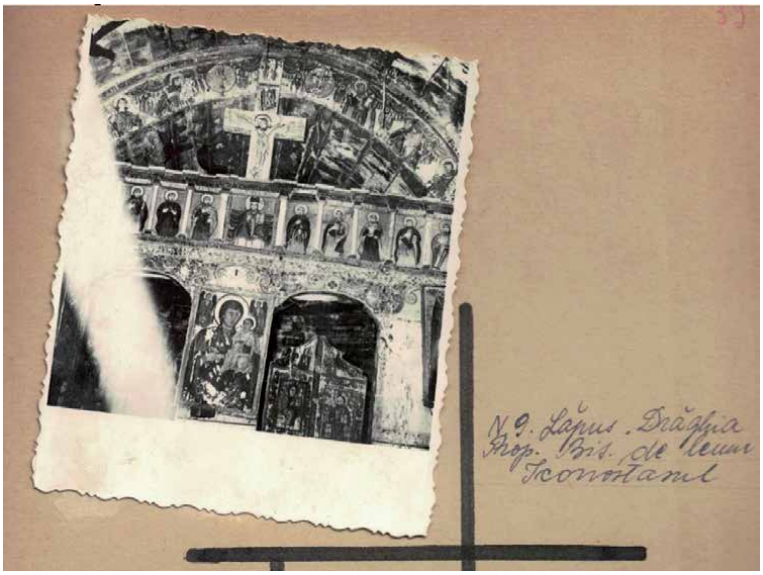

Figure 13.
Virgin Mary and baby Jesus (archive photo) [7].

10. The table cloth

There are patrimonial objects of exceptional value in the area, apart from those belonging to the church. One of these objects is a table cloth belonging to a family in Baba Village, inherited from the grandmother of the family, while the original owner remains lost in time (**Figure 14**).

Figure 14.
Table cloth.

It is a table cloth with a unique elegance, but what makes it particularly priceless is the handmade embroidery featuring a metaphor of the Universe. The execution, with a highly bourgeois appearance for a peasant family, is unquestionably not a typical rustic, country-side embroidery, but more likely coming from the era of Hungarian dominance. The fabric of the usual hemp textile used in the area, it is very delicate and silky, presenting a more shadowy white than the pure crispy white we normally see in peasant houses. The embroidery work is of particular interest. It is associated with Sunday: Sunday as a state of being, when the air is still and there are less worries floating around, as a popular hearsay in the area, but also with Sunday lunch, most special lunch of the week. The decorative embroidery is also made in white, discrete, unlike peasants' models which are embroidered with vivid colors. One can easily get lost in the embroidery like in a symbolic journey. A representation of the Sun is featured in the middle of the cloth, surrounded by a Latin liturgic quote" Benedictus est. Domine in firmamento coeli" (tr. Blessed is the Lord to shine). The quote encircles the Sun, followed by the Moon and stars on a secondary plan. What is interesting here, beyond the esthetic beauty and the level of the craft, is the mix between the very canonic words and the images, coming rather from a laic world, representing the nature and the power of nature. God is represented by the universe, the entire existence. The center - our center - is the Sun. The second level of the work is represented by the four directions, each with its symbol - a mythical animal of power: the elephant, the eagle, the bull and the crane, surrounded by other natural elements and power of winds, like the Zephyr wind, arranged in symmetry. Overall, the construction and symmetry of the embroidery follows a mandala principle, and on different levels more quotes in Latin are introduced, for the grace of the Lord and virgin Mary. The richness of symbolistic makes it new every time one sets eyes on it and what invites for further contemplation is the fact that it seems unfinished. There are missing spots in its perfect symmetry where one can only imagine what elements should be added to close the circle; which is a wise concern: things do not have to be perfectly finished, the possibility of a continuity should exist, like in the wabi-sabi oriental tradition. In an ideal situation, 100 or more years ago, in the middle of this table, where sun is represented, a candleholder would mark the lunch occasion. Perhaps the candleholder would be the very same recovered in the same village, from the church, during some modernizing works, and abandoned in a deposit. The candleholder is not particularly valuable in itself, it is a humble object from an unpretentious material, probably coming from the old wooden church, and did not pass the beauty & shiny conditions imposed by the new tendencies in ecclesiastic objects: it is too modest.

But together with the table cloth they form a dynamic duo of simplicity, mysticism and gentleness, a benediction for the food and all those that worked for it and enjoy it.

11. The dowry coffer

The dowry coffer is a mandatory must-have in any traditional Transylvanian house (**Figure 15**).

This was originally designed for keeping the clothing and all the textiles that belonged to the dowry of the girls when they got married. It was a symbol of the financial power, the status of the family, but also of the talent and craft of the bride. The dowry chest was also an armoire so it had a central role in the house, hence the 3 main functions of the dowry chest: storage, furniture and ritualistic object. Most likely, originally it was a home-made object which later grew to be more sophisticated and special artisans had to work on it [8].

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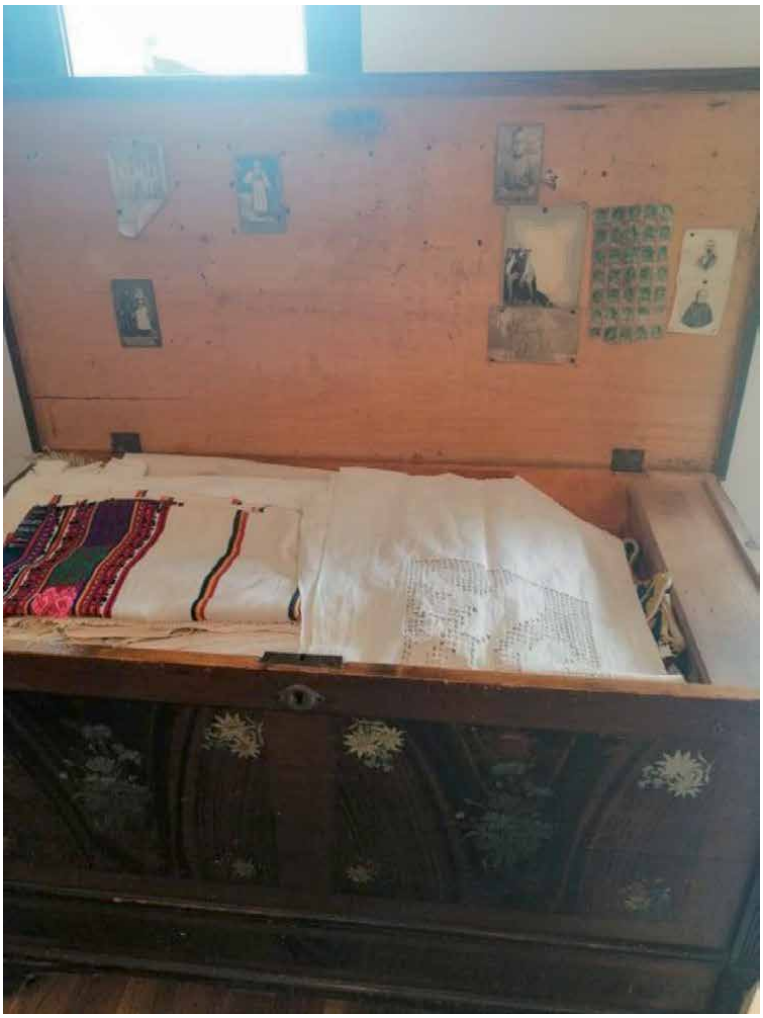

Figure 15.
The dowry coffer.

We'll go on with a dowry coffer from Drăghia village and its story. Today, the chest belongs to the Radu family, and it is inherited from a female ancestor in this family that married Radu Constantin from Drăghia (**Figure 16**).

The young girl came from another county, more than 100 years ago, from Dobrocina on Someș, the largest river in the area. Together with properties and animals, she brought also this chest. Inside the chest it is a lateral pocket where Ruxandra, the young girl, kept papers and other small objects. On the inside of the chest lid, she sticked pictures of her family. Every time she'd get homesick, she opened the chest to look at picture. On top of the chest, she kept pillows and other items. We can say that the dowry coffer is a continuation, an appendix of the bride. So many times, she opened it and took care of her personal items. She took care of the chest with such a warm heart, it was after all a silent witness of her life far away from home. Throughout the years it gathered all her memories and speaks to us today about the beautiful Ruxandra.

Most common objects that we can find in almost every house are the traditional towels (ștergare), that are not particularly used as towels, but rather as decorative items. They are rectangular piece of hemp cloth, sometimes embroidered with

Figure 16.
The family story in dowry coffer.

traditional patters or fringed at the edges. As decoration, they are placed above the icons or ornamental plates, to form wings-like accessories. Usually, they are made out of hemp, woven on the loom in a traditional manner. As a model, we present the towel belonging to Maria Rus, from Gâlgău Village, Sălaj county. She married in a village neighboring Drăghia, to where she brought, as dowry, various textiles. This particular towel is decorated with flowers in a vase. The embroidery, that took many weeks to be completed, represent a vivid representation of fresh flowers from the garden that have just been picked and set the vase. The towel is part of the private collection of Radu family from Drăghia.

Other not-to-miss objects in a local family are the pillow cases. They are entirely made from hemp, hand-woven on the loom, and sometimes later even cotton. But mostly hemp, because country-side used to be bountiful in hemp plantations and women were highly specialized in working with hemp. The embroidery is usually set in the middle part of the large piece of hemp, with various motifs: flowers, animals or geometric shapes. These pillow cases had a more decorative that practical purpose. On the other hand, the wealth of a family could be deduced from the number of pillows you could see in the house.

12. Conclusion

In terms of artifacts, known today as patrimonial artifacts, we try to recover and conserve them from forgotten places, yet the loss is major. Families who had/have such artifacts as family heirlooms usually perceived their pragmatic utility and used them till exhaustion, later replacing them with modern and upgraded alternatives. Moreover, at certain moments in time, they lost their purpose in the modern day-to-day economy, so they went out of usage. Of course, the new objects that replace them, work on the efficiency principle, an efficiency not necessarily backed up by quality or the emotion of the contact. A plastic bucket is certainly easier to use and to manipulate than a wooden or copper one. But following this transition, not only the artisanal objects disappear, but also the craft involved in their making, and along with the craft, the science and philosophy behind it. Ultimately the water kept in copper or the brandy kept in glass covered in wickerwork (to protect from light and maintain a steady temperature), the fruits macerating in wooden barrels, the cheese aging in oak - in themselves, are better for our health and reflect on a more sophisticated level, an upper stage of taste education.

Patrimony is not just the object in itself, the object is perishable and needs to be replaced regularly, but it is about the entire complexity that allows its continuation. Patrimonial conservation, more that valuing the objects in themselves, is about valuing the craft, the craftsman, the ones that know and do. Craft, handmade objects are expensive today, precisely because of the scarcity of the craft and our lack of willingness to pay for their time and their knowledge, gained also in time. We find cheaper, more efficient ways. Regardless of the perspective we look at things, patrimonial conservation is about respect for time and knowledge gained in time.

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Chapter 24

Traditional Games: Socialization and Culture in Kabylie

Soraya Dodoo

Abstract

Traditional games are an important patrimony of the world's recreational cultural heritage. However, they remain little valued, even neglected to the detriment of sports. This study focuses on traditional games in Kabylie, and the process of socialization through the games.This reveals valuable information on the structures underlying traditional games, and their ethno-motor. A study that associate two fields. The world of bodily practices and the world of Ethnology. Two different worlds that share one reality which is traditional games.

Keywords: Traditional games, Socialization, bodily practice, Culture, Ethno-motricity

1. Introduction

For a long time, physical activities have been regarded as bio-energetic acts. It is until Marcel Mauss work that we discovered that bodily practices are cultural social phenomenon. Marcel Mauss defines body techniques as "the ways in which men, society by society, in a traditional way, know how to use their body" [1]. The ways of playing and moving one's body are not universal but as diverse as languages, clothes and dwellings. Adding to cultural aspect of body, there is diversity in practice movement. For examples, swimming is practiced differently from one society to another and even from one generation to another. In short, "each society has its own unique habits". Mauss Marcel [1] everything is not innate, but transmitted, learned and acquired through education. Everyone must learn to use their body according to what they learn from their family, their environment and their society. Everything is acquired. We are in the presence of a "phenomenon-biological-sociological. This emphasizes the strong impact of society individual's behavior. In fact, physical activities reflect their social context. P. Parlebas a pioneer of the praxiology-motrice sums up this phenomenon with the concept of "ethnomotricity" which is defined as the set of "fields and nature of motor practices considered from the angle of their relationship to their cultures and to the social environments in which they are located, developed" [2].

Likewise, we see "the game as a system" [3]. There is interaction between the players themselves, and between the players and the environment. Thus, the player is continuously in interaction and in communication with others, whether it is his partner or his opponent, and in relation with the external environment which is the space where the game takes place, and it is in these interactions that the game makes sense [4].

Thus, playful practices are not only physical acts, but they are also nourished by social representations, norms and values of a given group. Although, the richness, study of the games, there have been a little interest even ignored. A few classical authors have taken an interest in play and have studied it as an object. Among them, Johan Huizinga, in his seminal work Homo-ludens [5]. He defined the game as follows: "A free action, felt as 'fictitious' and situated outside of everyday life, capable nevertheless of fully absorbing the player. An action devoid of any material interest and any utility that is accomplished in a time and in an expressly circumscribed space, taking place in order according to given rules." Thus, gambling is a leisure and entertainment activity which allows the player to escape from work and obligations. But this freedom is achieved within the limits of time and within the framework of the circumscribed space. The game is rich, it has a meaning,. For Huizinga, play is older than culture and is the core of culture. He writes: "Culture in its primitive phase is played out. It does not arise from the game as a living fruit that separates from the mother plant, but it unfolds in the game and as a game." He adds: "However, it is important to characterize it as a basis and a factor of culture. This approach is shared by Caillois [6]. According to the author, this activity is unrestricted. Gambling as a leisure hobby is opposed to well-spent working time. If the working time is paid and productive, the game is characterized by free and unproductive. "Indeed, the game produces nothing: neither good nor work. It is essentially sterile". Another author Lévi-Strauss in (1962) devoted part of "A wild thought" to the analysis of an exotic game, with P. Bourdieu [7–9] who leaned on the question of the sociology of sporting tastes linked to style and social class. Much has been done since then, and the sociology of games has now established itself as a discipline in its own right. She therefore considers games to be a phenomenon that can be justified by a scientific approach, which attempts to objectify the movements of the human body, to understand how it develops and flourishes in a social environment.

2. Traditional games and identity

The neglect of traditional games in the sports practices of daily life of leisure time and the predominance of sport raise the question of our identity. It could be described as invasion that require awareness. According to Hall, in order to Preserve the cultural aspect, and to escape the latent constraints of a naturalized culture "is to become actively and consciously involved in those aspects of one's existence that seem most natural to him." [10].

In fact, to escape the predominance of sport, there must be an awareness of the crucial role of traditional games as a cultural and socializing phenomenon. In fact, Socialization plays a crucial role in the development of a child's personality. Through the socialization we are filling in the child by by the means of the bodily practices the standards to be respected, the values to be adopted, namely courage, strength, wisdom... All these aspects structure to model of the behavior of the person in accordance with society's expectations.

We take up the idea of P. Parlebas who emphasizes in this regard that the "process of socialization is in the play pact shared and internalized in the body" [3]. Through traditional games, the child comes into contact with rules and codes; in its very body, it shares the collective norm in all conformity and legitimacy. He continues his idea by noting that "the assimilation and internalization of these bodily practices as a code of behavior and in connivance with the way of life of this society directly affect the social aspects of social life: forms of communication , exchange, type of relationship with the body, conception of success, relationship to rules of

authority..." . The essence of traditional games is in the tradition that sets the rules. To this end, the tradition transmits to the game its codes, its rituals which constitute the master piece. Originated to the Maghreb culture, the reflection on the study of games has imposed itself on us for two reasons. In the first place, during our daily observation, we were struck by the disappearance of the traditional games in favor of the sport which is hoisted on the shield. The Algerian child plays football in the street, plays basketball and volleyball in sports clubs, while ignoring his own traditional games. In the second place, it is clear that the work on playful bodily practices in the Maghreb and particularly in Algeria is not legion.

Borhane Errais and Mohamed Ben LarBi have deepened their studies on playful practices in the Maghreb, qualifying them as changing practices.

In an article entitled Ethnography of bodily practices in pre-colonial Tunisia [11], all stress that: "In all certainty, we will answer that the colonial situation is at the origin of the disintegration and the dissolution of this bodily tradition. "(1986). Indeed, colonialism has substituted a universal model of bodily practices which is the sport, at the expense of traditional games which are put under wraps. B. Errai's point of view associated this fact to the forms of colonial and post-colonial domination which are "the determining factors of this mutation and which have contributed to the disappearance of traditional bodily practices by virtue of the culminating hegemony of sport which triumphs with panache in the Maghreb.

In French colonial schools, the Algerian child was exposed to French culture. In the playgrounds, he played French games introduced by French teachers, such as the game of "Sadraqqa" which is none other than the game of the Four Coins, or the game of Chechia which is none other than the game "Beret game".

This idea is also shared by Kent Edwards in his article "Traditional games of a timeless land: Play cultures in Aboriginal and Torres Strait Islander communities" According to Kent, the impact of the European colonizer has transformed even participating in the disappearance of many Aboriginal games. According to Kent, when a culture is under attack, it is always the traditional games that are most affected. It change both inter-group relations and cultural practices. When the colonizer strikes down their material resources, the games take second place in the sense the preoccupation of the group is more to survive than enjoy leisure [12].

3. Classification of games

Classification is a key step in the construction of the object. It is often attached to a philosophy, a theory adopted by the researcher. Taking classification as a thread of analysis and a technique, it makes it possible to classify and organize the world of games. Roger Caillois, in his book "Les jeux et les hommes [6]", divides the games into four headings according to the role of competition, chance, simulacrum or vertigo. He calls them Agon, Alea, Mimicry and Ilinx. He writes on this subject: "We play football or marbles or chess (Agon), we play roulette or the lottery (Alea), we play pirate or we play Nero or Hamlet (Mimicry), we play to provoke in oneself, by a rapid movement of rotation or fall, an organic state of confusion and disarray (Ilinx)" [6].

Caillois associates Agon with dueling, rivalry, competition; sporting events are an ostentatious illustration of this category. On the other hand, Alea is associated with the game of chance where fate and luck are major factors of success; we find this in the example of the games of roulette, tossing a coin. The Mimicry represents role-playing games where the player plays to pretend, such as disguise games or mask games. The last category is the Ilinx game which alludes to vertigo, where the player seeks for a moment to detach himself from stability and enter a world

of spasms, trance, dizziness, as for example the "dervishes seek the" ecstasy by turning on themselves".

The Caillois classification has the merit of identifying the games according to roles and criteria; on the other hand the last criterion (Ilinx) is put in reserve, because the player is in continual control of his actions. The vertigo is only a final sensation, but after controlled movement and ability, as the examples of acrobatics and sliding prove.

The person who plays is a person who adopts attitudes, chooses strategies, and invents behaviors that take shape in motor actions. Therefore, the player is in a system of interaction with the environment and with other players. This system of interaction is at the heart of motor action. As Parlebas points out, "every sport game is a system. There are double interactions: the players between themselves and the players with the environment". [13]. The key factor present in any situation is the notion of uncertainty: the informational dimension therefore takes on a major importance, insofar as it determines the behavior of the players. In an environment with uncertainty, the informational dimension is capital, because all decisions and all behaviors depend on it. In the case of outdoor games (forest, wood, large rivers), the player is in contact with the environment, he faces the forces of the world. Recognition of the terrain and training may nevertheless reduce the hazard. It is also important to note that a beginner and a professional player do not have the same perception of the pitch. In a ski descent, the professional player has prior information about the terrain, which allows him to choose the best strategy and succeed, while the beginner, lacking information, makes his decisions in a completely different direction. In fact, it is not the space, but the player's relationship to the space that determines the appropriate strategy for the game.

4. Internal logic

When we observe children playing different kinds of games, we see different behaviors. These are not chosen by the players, they are intrinsic to the rules of the game. However, if two players are opponents in the fighting game, they can be partners in a team game. It is the network that codifies the type of motor communication, which is none other "than the web of these possible interactions that will weave the socio-motor dynamic", namely who is with whom and who is against whom. ", (P. [2]) in reality, internal logic is a system of constraints which largely determines the motor behavior of the players. It presents a system of norms that the player assimilates and literally internalizes in his body when playing.

In studies on table mores, Elias Norbert makes a whole study of the norms that shape behavior. By civilizing table manners, it is all human behavior that is modeled according to this scheme. Norbert believes that standards are self-monitoring processes. He underlines that "the social norms which have been imposed on the individual from outside are then reproduced smoothly by self-restraint which to a certain degree operates automatically even if, at the level of consciousness, the person in question refuses it" (973). Hence the idea "to analyze the behaviors that a given society proposes to its members and for which it intended to condition them". (Elias [14]).

5. External logic

A priori, the structural constraints of a game form the model that guides motor interactions in the game. Still, the rules that organize the symbolic universe of

sports games represent a major issue. On the other hand, players are free to interpret the practices in their own way, according to their own aspirations. In fact, the structure of the game can be interpreted from the outside by logic, an external logic, which attributes symbolic meanings to it. For example, for a long time soccer (football) was an exclusively male sport. Today, it is a game played by girls too. The same goes for the game of hopscotch, which in the middle Ages was exclusively a popular adult game. Today hopscotch is a snap, plus again, a little girl's game. (P.Parlebas,(2005) Internal logic is at the heart of the external logic game. These two levels of the game lead to a social reality which is that of the socialization of the child. As Joseba Extxebeste underlines in his study on Basque sports games: "The two logics (internal and external) are part of the cultural reality of play, but they are two different levels of the same social reality [15].

To better understand these two types of logic, we will take as a reference the cockfight in Bali (Indonesia). The American anthropologist Clifford Geertz reveals in his article "Deep play: Notes on the Balinese Cockfight", (973), where he describes the cockfight, all the social dynamics where the two logics combine and coexist. By representing the internal logic, we see that the game is an opposing duel between two players (the two roosters). It takes place in a boxing ring surrounded by a crowd of spectators. A coconut in a bucket of water is used to mark the start and end of each encounter. The duration of the game is indefinite. The show takes place in the afternoon and continues until sunset. The rules that accompany each part of the game are followed and passed down from generation to generation. The game leader is responsible for enforcing the rules and his authority is absolute. About nine to ten games make up the program, and each game looks like the others.

Cockfighting is part of the Balinese way of life. Apparently it's just a cock fight, but in reality it's a men's fight. This fight scene is a matter of society [16]. Engaging a rooster in a fight is a duty for every citizen. What makes this game so serious is not the money, but what is happening on the sidelines: the shift from the status hierarchy to the cockfight corps. Sociologically speaking, this cockfighting game is a representation of a complex tension field, wagered, controlled and ceremonially exposed, but in its depth refers to the context of everyday life. Each people cultivate its own violence. This cock game, which is observed, played, and fascinating, is an illustration of the violence of the Balinese. However, Bali's deep psychological identification with their roosters is inexplicable. If in everyday language the rooster is a symbol of virility and heroes, it is the subject of attention and admiration. The cockfight for the Balinese consists of playing with fire without being burned. It ignites rivalries and hostility between groups and individuals, but these are camouflaged in the game. What is forbidden in everyday life and presented in broad daylight, after all, is "just a fight. Of roosters". (1973).

According to the author, what is significant is not the combat in itself, but the social meanings, the symbols, in short the culture which, according to Clifford Geertz, "is only a set of texts"which goes beyond written and verbal material. From a sociological point of view, to read the game as a text is to show its aspect as a rite or a hobby, it is to take a step which allows to understand the emotions and the sensitivities which show through the excitement of the game. Crowd, like the despair of loss and the pleasure of triumph. These exteriorized emotions are spread over a common text. To attend and participate constitute for the Balinese a kind of sentimental education which reflects their own violence and all the themes associated with it: cruelty, animosity, male narcissism, rivalry for status, gambling, sacrificed blood. As such, it is clear that any collective phenomenon aims to "say something, to signify something" Our objective is to study Kabyle culture through their traditional games, a way of getting to know the Kabyles and discovering their culture. To use Geertz's phrase, it is "saying something to someone else".

6. Kabylie traditional games

In this paper, our purpose is to understand traditional games in their sociological meaning and to define them in the context of Kabylie society. A corpus of traditional games were collected from the Kabylie region located in Algeria. A mountain region in northern Algeria bordering the Mediterranean, located east of Algiers and Mitidja whose main city is Tizi-ouzo. We found out many, among these types of games, Radjma (target shooting). It is a game that is played during big events (marriage, circumcision). Before the departure of the bride, the men of the wedding procession (Iqeffafen) execute the target shooting under the sly gaze of the crowd coming to attend the show. It is about throwing the stone a certain distance to crack an egg. The players take turns attempting to hit the target. Another example of the game is "Thaverninte" (wooden spinning top or Zerbout). A piece of wood is cut with a knife into the shape of a spinning top. After having planted a nail at the point, the shooter must throw the router up and down with the palm of the hand in the direction of the movement, and before it comes out of the string, pull to give it a trajectory. Another games, the sliding game. It is played on large areas of land located on the average slopes of mountainous regions which are usually used for growing olives and figs. Covered with snow in winter, they become a field of attraction for children. This game consists of climbing to the top of an icy slope and then descending using the leaves of prickly pears, because its thickness and its richness in water make it easier to slide.

Although these games are psychomotor, played in solo. There are many quasi-games among them that players indulge in without concern for competition and without specific rules. As an example, the "Tiferfarine" game is a manufacturing game in which a reel must turn directed by the wind. The children choose a few figs that are not yet ripe and very firm but already big enough. They dig four diametrically opposed holes that communicate in the center of the fig. This is then pierced with a thorn that is fixed in a thatch held vertically. The child, using another straw, blows in the direction of the holes and the fig begins to spin rapidly on itself. There are others games sociomoteurs, played in group. For example, the games.

"Tikare", which is similar to karate (sport),in which two players kick each other hard. We also find the game of Matreg el-lil, where two players stand face to face with a stick. A player throws his stick high in the sky, and the opponent must then aim and hit it before it falls to the ground. Another sociomotures games is.

"Takhatoumt-el Khatem". Two groups of players face each other. All the players in one of the groups have their hands under a sheet or blanket, and one of them hides a ring in one of his hands. The opposite group tries to guess who has the ring. We scrutinize everyone's reactions because there are often people who hesitate and are afraid of being discovered.

If the ring is found, they switch roles. The hiding of information is the criteria of this game. There are also festival games, for example, in the game Maafra, which takes place at every Eid festival; players separated by a river throw stones or pomegranate fruit at each other. All these games a part of daily life and rituals.

Daily life in Kabylie requires a lot of physical effort and a hard-working, strong and resilient body. The man must support himself thanks to the resources of the earth: cultivate, harvest the fruits, the grains... The woman must also be strong and provide for the needs of her family (weaving, grinding wheat, making pottery, draw water from the fountain...).

In addition, the work in the fields for men and women is done in groups. We see this community in the case of women who go to the fountain in groups of relatives and neighbors to carry water, and who also help each other to lift and put on their heads the huge sheaves from the harvest.

These agricultural works bring the children together. During these days in the fields, moments of relaxation are reserved for games, for the children who accompany their mothers to the fields, and for the young shepherds (Ameksa) who take their cattle to the pastures. Games are part of daily life and nourish the body and structure the behavior with expected social norms.

7. Example of games

7.1 Game name: qochra

Horma for the Kabyles means honor, which symbolizes the woman and the house. The respectability of the man, which is symbolized by the 'Nif", consists in protecting this honor from all defilement. Failure to meet this standard is for the individual to condemn himself to social suicide (isolation and shame). In this "Qochra" game, the sociological weight of this value is indisputable and is played by children.

7.1.1 Characteristic of the game

Flat terrain
Material: A cork ball and a curved end stick
Period: The first days of spring
Social network: One against all
Gender: Male
Start of the game:

A group of players with a curved end stick in a circle around a cork ball. At the draw, they designate the father. The latter is placed near the ball (his daughter).

Procedure: The father's goal is to defend the ball by trying to prevent it from going outside the circle, which represents the house. The opponents, with their sticks, instead try to push the ball out of the circle. If the ball or the father (with his stick) directly touches a player saying, "This is your daughter," the affected player becomes the father of the ball. In the event that a player grabs the lost girl and takes her to wife without the father managing to bring her home, the other players say that he is getting old, and they taunt his weakness by singing: "He got old, he got old, he went to Beni Kelleb and he ate a whole cake with a gourd of whey". They also sometimes tie the ball under the shirt of the loser, who is then identified with a girl who has been made a child. The emotions in this game are very strong, and it happens that the father humiliated by the words of his opponents retires in.

Tears, also affected by the dishonor of the illegitimate pregnancy.

8. A look at socialization

- From the previous descriptions, it turns out that games are a form of socialization which is transmitted through the rules of conduct approved by society.

- In traditional games, socialization is at the heart of motor action insofar as it plunges the child back into his environment, and as a result the child subtly internalizes the systems of norms secret by society. The body in the game is not only a mechanical, biological object, but also a reservoir which absorbs all symbols, cultural rites. This is not done in a brutal way, but in a process of social learning.

- In the game "qochra", for example, the child in his driving behavior while defending the ball (the girl) from the opponents, thereby becomes acquainted with the norms and values - which are required and which he must respect at all times. What is expected from a child to defend and protect his honor which is the sacred domain (the woman, the house). Any offense is an attack on honor in the Kabyle language (Nif). Hence, the purpose of the Kabyle games is to integrate the child into the social bath which is the village life. This process of "kabylization" of motor behavior, mediated by the body, is only a means of interiorizing social behavior specific to the Kabyle communities.

9. Conclusion

It is clear that traditional games constitute a heritage of great wealth and a major source of information for the ethnologist.However; it is surprising that it has not been further exploited. It could be due to the mentality that prejudges traditional sports games as optional, uninteresting and old-fashioned objects; According to the general expression of those interviewed about traditional play practices in children's leisure games today, the answer is often: "Times have changed, this is a game from before."

The loss of traditional games is a factor of considerable cultural impoverishment which creates emptiness and boredom in the villages and reinforces the importation of another model of foreign entertainment: football, cinema, radio, TV (Warnier, Laburthe: Ethnology, Anthropology) [17].

Reinventing these games, taking them out of memory, instilling them in state institutions (schools, sports clubs), making them known to this new generation ... require that we question the mentality that believes that sport is the unique model of excellence. To change this dilemma, it is up to sports managers and school educators to find solutions to reinvent games in children's sports activities as an identity cultural heritage, so that they know themselves as well as others. As Joseba Extxebeste suggested it so rightly: "It is not a question of seeing with nostalgia a time gone by, but of reinventing the traditional playful culture by adapting it to the needs and to the reality of our days. "(Extxebeste Joseba, [15]).

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This Edited Volume "*Heritage - New Paradigm*" is a collection of reviewed and relevant research chapters, offering a comprehensive overview of recent developments in the field of social sciences and humanities. The book comprises single chapters authored by various researchers and edited by an expert active in the social sciences and humanities research area. All chapters are complete in themselves but united under a common research study topic. This publication aims at providing a thorough overview of the latest research efforts by international authors on social sciences and humanities and opens new possible research paths for further novel developments.

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