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navigating
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navigating uncertainty

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International cooperation for the digitization of cultural heritage: emerging models and the legacy of the lockdown

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ABSTRACT

Although during the last thirty years there was an increasing demand for digitization of cultural heritage (Rossato, 2020), the process of digitization remains demanding (Evens and Hauttekeete, 2011), since it requires not only significant financial investments but also specific competences, skills and software. Several cultural heritage institutions therefore prefer to outsource the digitization process: in countries that are still developing their digitization skills, often this outsourcing requires hiring companies and professionals at an international level. The covid-19 pandemic has highlighted that this model is inherently fragile, and that innovation is needed in the way international cooperation is implemented. This paper addresses this topic, by analyzing the best practices of two international projects of digitization of Brazilian cultural heritage and reflecting on how these two case studies could help us change the traditional approach to digitization in Global South countries.

Keywords:

Digitization of cultural heritage; International cooperation for cultural heritage; capacity building and knowledge transfer for cultural heritage

Introduction

Over the last decades, cultural institutions have placed increasing attention to the digitization of their cultural assets (Affleck et al., 2008), not only as a means for documentation, preservation and survey but also as a tool for increasing the communication and outreach potential of their cultural heritage (Bachi et al., 2014; Ciurea & Filip, 2016; Valtysson, 2017; Trapp et al., 2010).

The process of digitizing cultural heritage is however a challenging one (Evens & Hautekeete, 2011), requiring specific competences, skills and software that is usually expensive and complex to use. As a result, institutions are often unable to develop these skills internally and opt for outsourcing the digitization process. Professionals in the field, belonging to universities, research centers or specialized private companies, are therefore involved in the process either through research projects and other cooperation arrangements, such as public-private partnerships or through contractual agreements (Borin, 2017). Moreover, given their high degree of specialization, professionals are often recruited at an international level, especially in those countries that are still developing local competences in the field, such in the Global South. This makes the digitization process rather expensive: costs related to travel and accommodation add up to other expenses needed for the copyrighted software and training courses for local stakeholders.

Since the outbreak of the covid-19 pandemic however, this model was no longer viable. First, cultural heritage organizations could no longer afford digitization expenses, often due to the decrease of funds both as a result of the lack of ticketing revenues and scarcity of public funding that during the emergency were relocated to more pressing issues. Second, travel restrictions prevented international professionals from travelling. Third, training courses were temporarily infeasible due to social distancing measures.

Therefore, new processes for digitization of cultural heritage and data management needs to be experimented. Procedures, based on online processes and easier-to-use open-source software, could indeed ensure heritage digitization and data management notwithstanding the challenges of lockdown. According to these emerging models, documentation activities are done by local enterprises, under the supervision of international experts, not only empowering local actors, but also decreasing costs and increasing resilience.

Based on these considerations, this paper aims at reflecting on the following two research questions:

- What are the best practices emerging from these experiences?

- What are the lessons that could be taken as guidelines for a post-digitized, “blended” future?

The paper is divided into five sections. After this short introduction, in section one the authors summarize the main points of the theoretical debate on the above-mentioned topics. In section two, the research design and methodology are explained, detailing also the criteria of selection of the case study. Section three presents the two case studies in São Paulo (Brazil), the digital documentations of FAU USP - Faculty of Architecture of São Paulo University and *Casa de Vidro*, Lina Bo Bardi’s house (both carried out with the cooperation of the Getty Foundation). In section four, the authors discuss the lessons learned from the cases and draw some recommendation and guidelines for the future. The paper ends with some concluding remarks on section five.

Digitization for cultural heritage: theoretical approaches

Digitization and access technologies provide interesting opportunities for heritage institutions not only to reach out to different types of audience but also to facilitate access to artefacts and collections for research and exchanges purpose (Evens and Hautekeete, 2011). “By optimizing digital accessibility, the economic and societal values of heritage collections are created” (Evens and Hautekeete, 2011:157).

Since the 1970s, the cultural heritage sector has placed increasing attention to digitization technologies (Affleck et al., 2008), mainly as a means to enable access to their collections (van Horick, 2005). The digitization of cultural heritage was initially perceived mainly as a tool for documentation, preservation and research. The first catalogues date back to the 1970, while in the 1980s several museums converted printed source material into digital files (van Horick 2005). Several pioneering projects were launched, such as the “Optical Digital Image Storage System (ODISS) of the National Archives and Records Administration (NARA, 1991) in Washington which began in 1984 and used digital image and optical disk technologies for the reproduction and storage of archival documents (González 1992 and 1998). In the 1990s computational devices were more easily available to users, who showed increasing interest for digital contents (Naughton 2000). This speeded up experimentation by cultural heritage organizations, libraries, archives and museums that started to fully embrace digital technologies for learning, teaching and research purposes but also for documentation and public accountability (Kenney and Rieger, 2000). In the 1980s, digitization concerned mainly specific in-house material such as particular manuscripts, artefacts or rare objects with high scholarly value (Kiernan 1981, Kiernan 1991, Prescott 1997). In the 1990s, several cultural organizations introduced digitization at a larger scale (Peacock et al, 2004) also as a

response to policy initiative pushing for the digitization of cultural assets. For example, the initiative “Internet Library of Early Journals”, a joint project by the Universities of Birmingham, Leeds, Manchester and Oxford, digitized some 200,000 pages of 18th and 19th century journals (ILEJ, 1999): this was partially a response of the UK government’s Joint Information System’s Committee plan to encourage the creation of Electronic Libraries (or ELib) and made available resources, services and infrastructure to increase the use of digital content in Higher Education (Jisc 2010). In the early 2000s “a decade of digitization and documentation for the Web [...] created a rich array of cultural and historical information across the museum, library and archive sectors” (Peacock et al., 2004).

The act of digitization is based on capturing existing, analogue material and translating it in a digitized representation of the original object: in the 1990s, digitized material started to be placed side by side to “born digital” material to complement and enrich the existing information and data. Cultural heritage organization started to use interactive displaying, using reconstructive 3D modelling techniques and using the potentialities of WEB 1.0. In the early 2000s, multimedia tours supported by online virtual reality and 3D survey techniques, were increasingly common. More recently, the scenario evolved in the development of mobile applications, in the employment of 3D interpretative models and in using the potentialities of WEB 2.0 and 3.0 and semantic web (Rossato, 2020 – see figure 1).

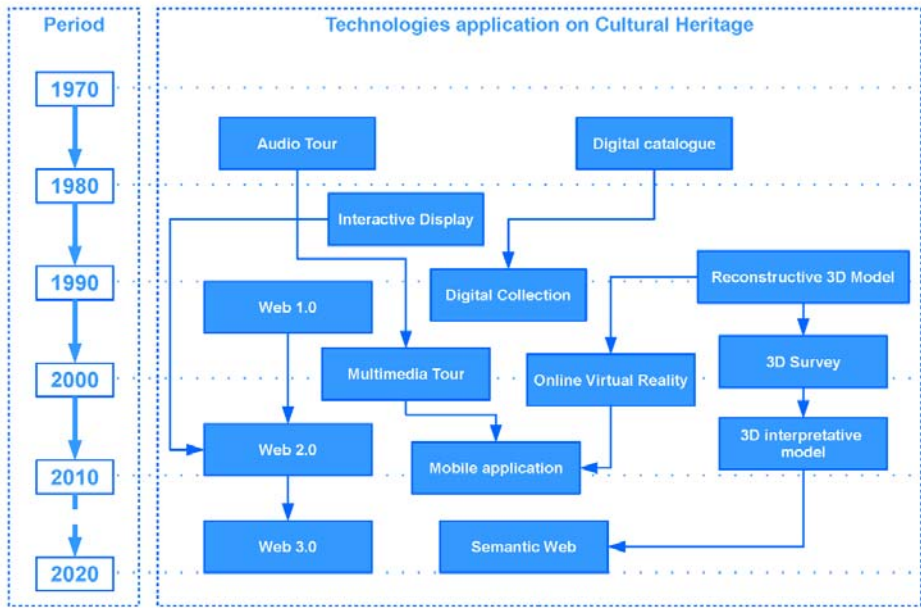


Figure 1 - Overview of the application of digital technologies to cultural heritage (Rossato, 2020)

Not only national and local cultural initiatives promoted digitization, but also international programs aimed at encouraging institutions to digitize their cultural heritage. In the European context, the Europeana initiative aimed at storing a mass of digital records of collections and making them available to anyone, fostering remote collaboration and wider access to artefacts. Thus, the European Commission's eContentplus Programme, which supported the creation of the Europeana portal, fostered the sharing of millions of digital resources from over 2000 European cultural organizations (museums, archives, libraries and audiovisual collections). In this case, digitization required a further effort: the project indeed demanded complying with specific standards, requirements and technologies that ensured that the digital outputs could be used in relation to the other Europeana partners.

As highlighted above, digitization has often a significant impact on management, especially at an international scale: it implied a clear vision and strategic thinking, project planning skills, knowledge of technology, availability of technological tools and therefore a careful organization of financial and

human resources. In the survey carried out in the framework of the project Enumerate³⁵, it emerged that almost 83% of the surveyed cultural heritage institutions in Europe were developing digitization activities, with a higher percentage of digitized contents among art museums and libraries. The least digitized formats were 3D objects (7%) as well as monuments and cultural heritage sites (8%), mainly due to the complexities in organizing the digitization process and the required investments (both temporal and financial). The survey also highlighted that 34% of institutions have a digitization strategy and 31% have developed specific policies for the use of their digital collections. Furthermore, the report underlined that digitization is usually resource intensive: the amount of staff involved in digitization processes varies from an average of 15 staff members involved for national libraries to 5.5 staff members in the majority of cultural heritage institutions. Even in smaller organizations, on average 3.3% of staff was dedicated to digitization. The costs of digitization projects on average varied from 40,000 € to 103,000 € per full time member of staff. The required funding for digitization was usually taken from internal budgets (87% of the sample), or from public grants (40%), while just 5% used private investments or had commercial sponsors (4%). The difficult financial sustainability often hinder efficient digitization processes: heritage institutions are thus often deterred by the high costs and the insufficient availability of funding for digitization or their time-limited nature (Lavoie and Dempsey, 2004; Navarette, 2009). This forces them to rethink their business models, with the dilemma of building digitization expertise in-house or outsourcing (Evens and Hautekeete, 2011). Thus, heritage organization were increasingly embracing the creation of strategic partnerships for the implementation of activities that are not part of their core competencies. In digitization projects, operational partnerships are developed to generate managerial efficiency, economies of scale, as well as knowledge and innovation sharing. However, these collaborations are often temporarily limited and project-based, hindering the possibility to evolve in structural cooperation (Bishoff and Allen, 2004).

Frequently, as the level of required digitization competences and skills increases, professionals are even recruited at an international level, with public-private partnership or contractual agreements that aims at capturing international best practices for digitization (Borin, 2017) especially for cultural heritage organizations located in countries that are still developing digital technologies (Rossato, 2020). As a result, the costs related to travel and accommodation add up to other expenses needed for the copyrighted software and training courses for local stakeholders.

The outbreak of the covid-19 pandemic however, has deeply questioned this model. Although there was a strong request of digital contents (Agostino, Arnaboldi, & Lampis, 2020; Samaroudi, Echavarria, & Perry, 2020), the pandemic highlighted the weaknesses of digitization processes based on high costs, uncertain revenues and international outsourcing of digitization projects

³⁵ More information about the Enumerate project, as well as its main outputs are available at: <http://www.enumerate.eu>

based exclusively on on-site activities proved unsustainable. Country responses to the negative effects of the lockdown on the cultural and creative sector indeed generally focused on strengthening the local/national organizations and institutions with specific financial and policy measures without specifically encouraging international exchanges (Vallerand, 2020).

There is therefore the need to rethink processes of digitization of cultural heritage and data management in order to find new solutions to these temporary problems that could nevertheless lead to long-term, more sustainable models of innovation. These innovative models could be based on previous experience that have already been implemented over the last years in projects of international cooperation for cultural heritage digitization and reflecting on what are the best practices that we can take and use during these challenging times and in the future (Maietti et al., 2020). This paper aims at addressing this topic, focusing on the analysis of best practices implemented in two digitization projects in Brazil.

Research design and methodology

As explained above, this research is aimed at investigating international projects for digitization of cultural heritage, identifying their best practices in order to reflect on how to innovate international cooperation approaches in current times and in a post-digitized, “blended” future.

The authors decided to use a qualitative research approach, since it is considered the most appropriate to the complex nature of the topic of investigation and the necessity to explore it in depth: this approach was considered as particularly consistent with the objective of shedding light on how the research topics were manifesting (Denzin, Lincoln and Giardina, 2006). This research could be considered as a preliminary investigation of the research topics, since it focuses on projects which started before the pandemic and continued during the crisis period.

The case studies were selected to comply in particular with the principle of representativeness (Patton, 2002) of international cooperation projects for digitization of cultural heritage in Global South countries.

Brazil was selected as a research area for two main reasons: first of all, due to the reflection on the need for digitization of its cultural heritage that was felt by the local communities of experts and professionals over the last years, especially as a result of emergencies such as the fire of the National Museum in Rio de Janeiro in 2018 that was described as the worst loss of cultural heritage in the history of the country. Second, Brazil was one of the countries most severely hit by the pan-

demarcation: this implied not only temporary isolation but also the need to find viable solutions given the rather scarce measures were taken for protecting its cultural and creative sector.

A preliminary mapping of potentially interesting case studies was made as preparation activity, focusing in particular on digitization project of architectural cultural heritage. Then two case studies were selected complying with two main criteria: the digitization project should concern the same architectural period, in order to face digitization projects that required similar skills and knowledge; second, the projects should have been carried out by a team of international experts working alongside local professionals; third, the project should have been multi-annual, implying that the international cooperation should have lasted for a sufficient time frame to evaluate its development.

Based on these criteria, two case studies were selected: the digitization of the *Casa de Vidro*, a modernist masterpiece by architect Lina Bo Bardi and the digitization of the building of the Faculty of Architecture of Sao Paulo University, the FAU USP, another modern masterpiece by João Batista Vilanova Artigas. The analysis of these case studies is presented in the following sections.

International digitization projects: some insights from the digital documentation of FAU USP and *Casa de Vidro*

As explained in the previous section, one of the main criteria of selection of the case studies was related to the belonging of the digitization project to the same architectural period, so that to make the analysis of the case studies more coherent and the results comparable. The selected period was the modernist one, given the peculiarities and diffusion of the movement in the Brazilian context.

The analysis of the case studies will therefore be preceded by a section dedicated to an overview of the modernist period and the problems related to its preservation, which aims to explain the context if the digitization projects.

Then the analysis of the two case studies will be carried out, focusing not only on an overview of the characteristics of the digitization project, but also to aspects related to its management and governance.

Modernism in Brazil: problems of preservation and the opportunities for international cooperation

Brazilian modernist architecture represents probably the highest expression of modern style in architecture in south America. In Brazil, after the visits of Le Corbusier during the thirties a new generation of architect started to design remarkable architectures by an elaboration of rationalism prin-

principles. The straight line became curved and organic and smooth shapes started to fill-up empty spaces in many Brazilian cities. Architectures by Oscar Niemeyer, Affonso Eduardo Reidy, Oscar Bratke, Lucio Costa, Lina Bo Bardi, Rino Levi and Joao Batista Vilanova Artigas, are still part of Brazilian cities' building stock and need to be preserved and enhanced to make them able to face this twenty-first century challenges.

However, currently the twentieth century architecture, due to a very quick deterioration process of its materials, is all over the world slowly modified in materials, volumes, colors or even demolished. Many of these architectures are still used for public purposes or as residential buildings but they usually are in bad conditions and their state of materials conservation is very poor. This is in part due to the vision that modern architecture did not qualify as art to be restored and included in the historically significant city.

Researchers and professionals concerned with the conservation of modern buildings frequently emphasize the need to accept change. This often sounds reasonable until the details of the proposed changes emerge. Modern buildings are at least as sensitive to apparently minor changes as those of earlier historic periods. The design of windows, for example, often is the architecture. Aspects that may be incidental in a Classical building may be central in a modern building. Furthermore these buildings for their concepts, shapes, materials, are perfect case studies to explore the integration of sustainable architecture and heritage conservation concepts, "The explosion of building technology starting in the late nineteenth century led to innovative building forms and construction materials that now pose new conservation challenges. This theme explored the approaches needed to advance the field in relation to environmental, technical, and physical conservation" (Normandin & Macdonald, 2013: 3-4).

The existing twentieth century building stock has become particularly interesting due to the current crisis in the real estate industry and the market demand for energy quality, environmental sustainability and structural safety. In this field of application, restoration, which focuses on important heritage in terms of history, architecture, and landscape (whose enhancement to promote tourism and culture) may act as a powerful driving force to foster economic recovery and state-of-the-art competences.

Also, the renovation process, which highlights the need to change the direction of regeneration and transformation model adopted in the territory and the evolution of the construction industry could drive the future towards sustainable, inclusive, and shared actions.

Heritage professionals working on it do not always have enough scientific data on the nature and performance of the materials and systems to develop the necessary protocols for conservation

treatment. As a result, international cooperation networks are often set up to fully develop the potential of preservation of modern cultural heritage in the country. To address these challenges, the Getty Foundation in Los Angeles, USA, developed “Keeping It Modern” program, a grant initiative that continues the deep commitment of the institution to the conservation of historic buildings. “Keeping It Modern” supports grant projects of outstanding architectural significance that promise to advance conservation practices. In this framework the two case studies described in this contribution, the *Casa de Vidro* (by architect Lina Bo Bardi) and FAU USP building (By Joao Batista Vilanova Artigas) received a grant by the Getty Foundation initiative for the implementation of an effective conservation plan. The international cooperation net among the involved stakeholder and experts (coming from USA, Brazil and Italy) was the key factor for the success of all the activities.

The digitization of the Faculty of Architecture and Urban Planning Center, João Batista Vilanova Artigas and Carlos Cascaldi, 1969, São Paulo, Brazil

In the early 1960s the School of Architecture and Urbanism at the University of São Paulo turned to one of Brazil's most important modernist architects, João Batista Vilanova Artigas, to design a new faculty building in collaboration with Carlos Cascaldi. Taking their cues from the Brutalism of the late Le Corbusier, Artigas and Cascaldi created a monumental structure that emphasizes the elegance of modern materials such as concrete and glass with minimal decoration. One of the building's most prominent features is its dramatic roof, a large grid of skylights set into reinforced concrete that fills the courtyard below with natural light. While past repairs have been undertaken on a case-by-case basis, a more holistic approach was required to properly preserve the building.

In 2016, a conservation management plan was developed with the support from the Getty conservation institute to introduce a holistic approach to the maintenance of the building's key features based also on a digitization project as main output of the initiative. This methodological approach will then be integrated into the teaching curriculum as a tool to educate the next generation of Brazilian architects on the value of strategic planning for the conservation of historic sites.

The Getty institute granted consisted in \$200,000, with the specific final requirement to present a coherent conservation plan of the building.

The objectives were several: first of all, to document and analyse in depth, the transformations of the building, its use, the perception of its spatiality along time, also proposing future developments. This aimed not only at drawing some guidelines for the use and occupation of spaces, but also to set parameters for the necessary review of installations (electrical, air conditioning, etc.). The second objective was related to the monitoring of the waterproofing system and the development of a preventive maintenance program for the roof, in order to develop conservation and preventive

maintenance measures for the system. The third task was related to the investigation of the reinforced concrete blind to understand its composition and its conservation state.

These objectives required an in-depth survey carried out through a digitation process which consisted in a laser-scanning survey performed by an international group of experts, the team of the Integrated Automatic Procedures for Restoration of Monuments (DIAPReM), of Ferrara University Department of Architecture.

The Italian research laboratory integrated the competences and skills of several local institutes and technologies that included the Escola Politécnica da Universidade de São Paulo (that took care of the concrete porosimetry analysis), the Instituto de Pesquisas Tecnológicas do Estado de São Paulo (specialized in chemical analyses and materials resistance), as well as some private companies such as the Pires Giovanetti and Guardia architects (concrete cleaning testing), Podarte (arboreal survey), Polígono Arquitetura e Engenharia (study and application in place of finishing repair mortar), Relevo Topografia (metric survey) and SGS do Brasil (polyurea testing).

The cooperation was established developing the laser-scanning survey in 2016, allowing the international team to work alongside the local partners and carrying out also some training courses, that aimed at enabling them to use the outputs of the digitization both for architectural analysis and representations and for diagnostic purposes. Training was indeed focused on “navigation” and querying of the 3D models also through open source software, in order to facilitate a direct use and application of digital geometric data for several research purposes. An additional section of the knowledge transfer was aimed to train participants on the use of laser scanner data as a support for in-depth analysis of the state of conservation of external surfaces, and future monitoring.

These activities empowered the local stakeholders, that were then able to use the data collected through the laser scanning and use them in the following years. The results of the laser-scanner survey were then digitally shared among the various teams of the project as well as with the Getty institute, allowing exchange of reflections and information. In the following years, the international and local teams (especially the one of São Paulo University) continued exchanging and elaborating on the database by online exchanges that built upon the competences developed during the onsite activities. The use of open software was the key to facilitating this phase and was described by a member of DIAPReM as the key to sustain the long-term implementation of the project.

The digitization project of Casa de Vidro, Lina Bo Bardi, 1951, São Paulo, Brazil

Created as a personal residence for Lina Bo Bardi and her husband after emigrating from Italy to Brazil in 1946, the *Casa de Vidro* was Lina Bo Bardi's first completed work as an architect and as a new Brazilian citizen. *Casa de Vidro* demonstrates Bo Bardi's resourceful use of low-cost fabrication techniques and industrially produced materials, as well as her adaptation of European modernism to the natural settings and craft traditions of Brazil. Rooted to the earth with delicate posts, the main volume of the house floats graciously above the ground, maintaining a seamless relationship with the surrounding landscape through large panes of transparent, sliding glass. Since 1995 the *Casa de Vidro* has been under the stewardship of the Instituto Lina Bo e B.M. Bardi, which was established by the architect and her husband to display and promote Brazilian culture and arts.

In 2017, the Getty conservation institute issued a grant of \$195,000 to allow an international team of conservation architects, landscape conservation specialists, cultural heritage experts, and civil and structural engineers to develop a conservation management plan for the property. The project also included a 3D topographic survey of the site that allowed engineers to identify potentially harmful structural deformations at the smallest scale, not perceivable to the naked eye.

The *Casa de Vidro*'s 3D survey was carried out through a collaboration with the DIAPReM center at Ferrara University (Italy).

A preliminary digital documentation test of the *Casa* was carried out in 2016 by DIAPReM in cooperation with São Paulo University (especially with Instituto de Arquitetura e Urbanismo – IAU São Carlos – and Prof. Renato Anelli), the Instituto Lina Bo and P.M. Bardi (São Paulo) to verify the feasibility of a full survey on the building for its restoration and a potential placement of new architectures into the garden in order to create an archive-museum of the Lina Bo and P.M. Bardi Foundation.

The Getty Foundation grant then allowed a full 3D integrated survey and diagnostic projects in the framework of the “Keeping it Modern” initiative, that focused not only on the different architectural features but also the relationship between architecture and nature. Moreover, the 3D documentation activities and the point cloud processing allowed several analyses in a multidisciplinary framework. Due to overall complexity of the project, the survey included 3D laser scanner survey, topographic survey and on-site analysis and photographic documentation. The following analysis phase dealt with the topic of visual and analytical querying of the data.

Similarly to the FAU USP digitization project, also the *Casa de Vidro* digitization project was based on the cooperation between international and local partners, although at a smaller scale: the DIAPReM research center, University of Ferrara, Department of Architecture, the Instituto Lina Bo e P.M. Bardi (São Paulo, Brasil), the IAU - Instituto de Arquitetura e Urbanismo (São Carlos, Brazil)

and Leica Geosystem Brazil (Rio de Janeiro, San Carlos, São Paulo) which provided technical support. The cooperation aimed at coupling the competences of the Italian and Brazilian teams, with a clear focus on leaving the project coordination to local experts. As a result, the conservation plan project was headed by a Brazilian academic, while specific tasks were carried out by teams with two coordinators (one local and one international). For example, the digitization task has had two project coordinators, one from DIAPReM and one from the IAU, thus facilitating knowledge transfer between the international and local experts.

After and during the project, the essential activity was based on online data sharing: the 3D database created by the Italian partner was sent to the Brazilian teams and it was the basis for the creation of informative 3D models (BIM – Building Information Modelling) thus facilitating the use of the results of the project by the local stakeholders for both conservation and maintenance.

Moreover, several dissemination activities to increase awareness of this heritage building's importance in local stakeholders were launched, also at an international level.

Good practices from past projects to future developments

The analysis of the two case studies allows the authors to draw some preliminary reflections on the good practices implemented in those international cooperation projects.

In both cases, the international teams were asked to carry out the on-site work since their expertise was lacking at a local level, but their role was interpreted as a capacity building one, as testified by their working alongside the local partners particularly in the *Casa da Vidro* project or by the training activities organized in the framework of the FAU USP project. This good practice could be the starting point for continuing international cooperation but with a “lighter” approach: once local competences are developed, the international partner had acted as supervisor of following phases, working remotely since his presence onsite was no longer essential.

The second interesting point emerging from the case study analysis, is that the onsite phase was considered just a part of the project, while much of the work was done online: this was facilitated by the use of digital material, open software and sharing of data between the local and international experts involved.

Furthermore, dissemination was interpreted as a common activity, carried out independently by the local and international experts, who participated in several conferences, seminars and colloquia. This helped outreaching the results to a broader audience, both at the local and the international scale based on the different networks and contacts of the involved teams.

All these features could be a starting point for future scenarios, since they blend onsite cooperation and online activities building on the competences and contacts of both local and international project members.

Concluding remarks

The aim of this paper was to investigate best practices emerging from international projects of digitization of cultural heritage and how they can be used as lessons for creating guidelines for future scenarios.

The literature review highlighted that although there has been a growing demand for digitization over the last four decades, digitizing cultural contents is still challenging due to its still high costs and the need for specific software, knowledge and skills that are not always locally available, especially in Global South countries: this leads cultural heritage organization to outsource these projects, often to international experts. The COVID pandemic has highlighted that in those countries the crisis hit particularly hard the cultural and creative sector but very rarely measures were taken in order to support cultural heritage digitization. This posed further challenges for international projects of digitization, that were already costly and difficult before the pandemic-related restriction.

In order to find new models that could deal with these issues, the authors decided to reflect on the best practices of international digitization projects carried out before the pandemic time, in order to understand how these experiences could lead to guidelines for the lockdown and post-lockdown period. Two case studies of digitization of Brazilian modern heritage were selected: the FAU USP building and the *Casa da Vidro*.

The analysis highlighted that an initial onsite exchange between the international groups is at the basis of the development of digitization projects and that could be used as a training and capacity building tools to allow local partners to develop required specific skills. If remote work is planned from the beginning, after this initial onsite phase, the creation of digital shared databases and digital tools of project management could easily be employed as main work methods, reducing costs but not preventing the partners to effectively carry out the project together. This is also applied to the development of dissemination, awareness increasing and other outreach activities, that could be planned, coordinated and partially carried out online.

These results could lead us to draw some potential suggestions for the post-lockdown period. The “blended” model of implementation of the analyzed digitization project could indeed be successfully applied also in a post-pandemic scenario. Indeed, it not only encourage international experts to

empower local stakeholders with knowledge transfer and skills development in order to be able to work together with them in the following online phases of the project but also boosts online project implementation and data sharing reducing costs and time usually dedicated to travelling. Online coordination could also be a good method for planning dissemination and outreach activities in different geographical areas. Working from “home” also in international digitization projects could indeed be considered more sustainable in the long run and also potentially enabling cooperation that was previously hindered by lack of funding or distance.

The digital shift that was imposed during the lockdown paved the way for reflecting on these issues as a potential desirable scenario, highlighting the need to find more virtuous and efficient models of international cooperation. This crisis period could therefore be a good occasion for reflecting on previous good practices and using them both in the current situation and in a post-digitized, “blended” future.

In order to develop a more comprehensive analysis we consider essential to continue the research in the upcoming months and years to have a longer time-frame which includes at least a year after the end of the crisis, so that the longitudinal analysis could reflect on the use of models and best practices of international cooperation also after the end of the pandemic.

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