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**PRESERVING THE PAST TO DESIGN THE FUTURE  
READING, INTERPRETING AND TRANSFERRING KNOWLEDGE  
THROUGH ARCHIVES**

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**ABSTRACT**

The diffusion and development of digital technologies had radically changed the way in which museums and cultural institutions offer content to the public. In this regard, the academic field has been discussing about the connection between the Design discipline and Cultural Heritage for several years; this is due to the profound transformations faced in both Design and Cultural Heritage areas. Through the description of two different projects we intend to highlight the problem of technology, which does not represent a solution to all the concerns about archives, protection, use and enhancement of the Artworks, on the contrary it represents an instrument and, as such, it should have empowering and emancipating capabilities.

In particular, this contribution will describe the activities of the research team aimed at 3D digitization of the *Tribuna degli Uffizi* in Florence, and of two Egyptian Sarcophagi belonging to the *Musées Royaux d'Art et d'Histoire* in Brussels. The paper wants to emphasize the contrast between the "partial failure" of the Uffizi Tribune project, whose model did not produce any relevant result regarding knowledge and dissemination; in relation to the Sarcophagi project in which the digitization has been interpreted as a tool for enhancing and spreading the knowledge contents discovered during the restoration. Comparisons between these two projects have given way to this reflection concerning the digitized heritage and consequently the nature and potentials of digital archives.

Archives should be containers of information and knowledge ready to be activated for social and cultural purposes. As a system of knowledge open to multiple uses, reuses and interpretations (Sennet 2008), the archive allows both synchronic and diachronic actions for the narration of memories. The design process in this context can develop projects for different cultural experiences in order to foster the inclusive dimension of historical/artistic assets through archives.

Through the description of two different projects concerning the application of design processes and methods to the field of Artworks using three-dimensional digitization, this contribution wants to give substance to a reflection that is inserted into an ongoing PhD program at the University of Florence. The Design culture has changed its nature, becoming a *forma mentis* that allows to give appropriate answers to contemporary phenomenology and issues. For this reason, working with holistic and organic strategies, it can operate on archives defining cultural paths accessible to multiple levels of knowledge.

**Keywords:** design and cultural heritage; archives; digital technology; knowledge; digital heritage

## INTRODUCTION

The academic field has been discussed about the introduction of digital technologies in the cultural heritage scenario for several years and in different disciplines. With the aim of to tighten the field of interest we will elaborate on the connection between the Design discipline and cultural heritage field of study; this connection is due to the profound transformations faced in both Design and Cultural Heritage areas.

These changes have innumerable reasons, one of which is certainly the transformation of the notion of cultural accessibility in the global society, but a fundamental role should be attributed to the application in the cultural heritage sector of new digital technologies. (F. Irace, 2013 p.) [1] Thus, the application of technologies has allowed to open new scenarios regarding the role and methods of design applied to cultural heritage [1] [2].

Substantial progress in the digitalization of Artworks has enabled the acquisition through digital products of a rich archive of wealth and specialized knowledge, radically changing the way in which museums and cultural institutions offer content to the public. This acquisition is therefore a decisive step to contribute making Artworks not only a heritage to be preserved but also a pool of values on which develop cultural and economic models, with the aim to support research, conservation, restoration and models of use of the Goods themselves.

This contribution will describe the research activities aimed at 3D digitization of the *Tribuna degli Uffizi* in Florence, and of two Egyptian Sarcophagi belonging to the Musées Royaux d'Art et d'Histoire in Brussels. The paper wants to analyze both results in order to understand the reasons why one project did not produce any relevant result regarding knowledge and dissemination; and on the contrary, the other did. Comparisons between these two projects have given way to a reflection concerning the digitized heritage and consequently the nature and potentials of digital archives.

## CASE STUDY 1 - TRIBUNA DEGLI UFFIZI

The most known *Tribuna degli Uffizi* is a room located inside the Florentine museum named Uffizi Gallery. After the restoration completed in 2012, the *Tribuna* is currently closed to the public for conservation reasons.

It is a fascinating environment that contains unique preciousness both in its structure and in its content. *Tribuna* was commissioned by Ferdinando I dei Medici, it is a room with an octagonal plan whose vaulted ceiling has about three thousand mother-of-pearls (fig.1) setted into red stucco. In this room are kept 14 statues of Roman times belonging to the personal collection of Ferdinando I dei Medici and it hosts a table that represents one of the most extraordinary examples of Florentine mosaic [3]. Currently, the visitors of the Uffizi Gallery can only admire the *Tribuna* overlooking from one of the three entrances.

The aim of the *Tribuna* digitization project was to give the public an opportunity to visit the room and its content from a closer point of view (Fig. 2). Precisely, the purpose was to provide visitors with an interactive screen that could allow virtual approach to the



works where it is not physically possible, in order to admire the details, obtain information, observe the works and their container from an unexpected point of view.

*figure 1. 3D reconstruction of the Tribuna degli Uffizi voluted ceiling*

The project involved the opportunity to virtually “visit” the environment and its content through an interactive screen installed onsite in the Gallery just outside the *Tribuna*. that should have allowed to approach the works with no concerns about distances or any kind of physical and dimensional limit.



The first objective for this digitization project was to obtain a realistic quality model and, in order to reach that, the whole acquisition process had to be designed properly.

*figure 2. 3D reconstruction of the Tribuna degli Uffizi*

For the 3D reconstruction the project team decided to combine a traditional architectural relief, accompanied by photographic documentation, with the 3D scanning of individual Artworks. All the statues in the *Tribuna* were 3D scanned in particular five larger and nine smaller.

The bases were separated in two categories: one type, with square morphology, has undergone a traditional type of relief; the second one, richer in decorations, details and undercut surfaces, has seen in the scanner the optimal tool to be detected. The lightness (in terms of mega bytes) of the output model is fundamental in relation to the output expected from the reconstruction: recreating an environment and its content on digital support and allowing the user to navigate and explore the environment in detail.

As previously specified, the output of the digitization activity was a virtual reconstruction, likewise is usually done in these cases, by borrowing game design techniques.

A large touch screen has been installed to allow visitors to navigate within the three-dimensional model. After three years the screen has been removed from its location and the three-dimensional digital model of *Tribuna* forgotten and never used again.

In the retrospective analysis of this case study we need to highlight the failure in terms of participation of the museum user that led to the removal of the screen that should have allowed the virtual visit of the Tribuna environment.

## **CASE STUDY 2 - SARCOPHAGI**

On the occasion of the Sarcophagi exhibition at the Museés Royaux d'Art et d'Histoire in Brussels (10/15/2015 - 30/04/2016) The Istituto Europeo del Restauro of the Ischia island (1) has promoted, an innovative tour that allowed the public to follow in real time the restoration operations for two Egyptian sarcophagi of the XXI dynasty, which were "exposed" together with the restorers instead of being temporarily removed from the exhibition path and restored elsewhere.

Inside the exhibition, a glass capsule was built (fig. 3) with the aim of hosting the resto-



*figure 3. The glass capsule*

restorers working on the sarcophagi; On this occasion was applied the 3D scanning process integrated with the color acquisition, this detail represented a substantial difference as it has allowed to detect, beyond the wooden surface its characteristics and irregularities, also the polychrome coating of the sarcophagi.

The aim of the project was to support the wooden restoration through the use of 3D models in order to generate scientific and disseminative material that would permit the public to participate in a generally reserved activity, understanding the choices, the processes and the discoveries of restorers.

Using the elaborated 3D models (Fig. 4) it was possible to compare the works before and after the intervention, simulate the restoration itself and inform the public about discoveries and describe the sarcophagi from an historical and constructive point of view. The radiographs of the boxes showed in which parts the polychrome coating needed to be fixed, which areas of the sarcophagus box or lid had undergone some sort of changes



and renovations during previous restorations. The primary result was a success in sharing the restorers skills and historical Egyptians knowledge through digital media and 3D models on which it is possible to intervene to simulate, cut etc. ..

*figure 4. Result of the Sarcophagi 3D scan.*

Although, once the show ended, all the material generated was not disclosed, the exhibition was a great success in terms of participation. Furthermore, the 3D models were a fundamental support for the preparation of the restoration intervention report.

## FINDINGS AND DISCUSSION

Digitization had the goal of spreading the values of knowledge and use of the artworks through a design-oriented interactive models, for their conservation, dissemination and enhancement. The research, conducted through the design culture aimed to compose new services regarding the enhancement of heritage, as well as to outline new museum scenarios and new models for the management of the artistic heritage.

In both projects were applied the same digitization process with the same tools and attention to the realistic quality of the output models.

The contemporary restoration techniques supported by digital technologies can define new levels of knowledge and emotional involvement of the public. If major museums such as the Museè Royaux d'Art et d'Histoire in Brussels develop "live restorations" in special spaces visible to visitors, it is possible to develop in-depth or didactic experiences that make the audience capable to understand the importance of the work of the restorer and maybe even to know lesser-known stories about a work.

On the other hand, as in the *Tribuna* project, there are many cases of withdrawal by Italian museum institutions of technological applications that should have represented an innovative and enabling tool for access to portions of heritage. Other significant examples are the disposal of areas in charge of virtual reality by the MAXXI museum in Rome, or the abandonment of apps developed for specific museums.

Trying to operate a critical reflection on the reasons for successes and failures, we could advance the hypothesis that immersive and pervasive digital technologies are exploited to "extend" the physical and conceptual presence of a work by putting initiatives into practice, even in the form of event, where knowledge is also "built" and not only exclusively "transmitted".[4]

Hence, the feature of event that had the sarcophagi initiative, was probably the real key to success because it allowed to "build" knowledge. This conduct us to reflect on how digital technologies, in the form of enabling tools for integrated projects of personal and social knowledge, play a fundamental role, but we must not fall into the mistake of considering the technological means a solution *tout-court* to all the problems of fruition and dissemination of works of art.

In the *Tribuna* project, design methods entered the museum "on tiptoe", acting on the physical dimension of the spaces and studying their best condition of visibility [1]. In the Sarcophagi case, on the other hand, design has become an interpreter and connector of knowledge, has acted in an interdisciplinary context operating on the perceived quality and participation [5] of the visitor. This attention to perceived qualities emerge "in the theme of" design of experience ", [...] the ability of design to prefigure design scenarios, with attention to new contexts of use, becomes a key competence to support the process of innovation, an extent that sometimes assumes a consultative and autonomous dimension in which the object of the project is no longer the product but the scenario itself "(Manzini, Jegou, 2004, p 189) [6].

Therefore, a fundamental role for the disciplines of the project is outlined. As Viviana Trapani (2013) wrote "design can not operate on cultural heritage, as it has historically done on the product/object: it is not enough to establish quantifiable tools and objectives; but it should open spaces for the project of new cultural productions and for the definition of new relational competences, interpreted by designers [...], building the ground for the development of new visions and new practices . "[7]

## CONCLUSION

Cultural heritage and works of art alone mean nothing. This may seem like a shocking statement but what makes them so important is not only the material aspect or the technical skill that made them, the more important is the history of humanity condensed in cultural heritage and the ability it has to generate new culture.

Even digital technologies alone mean nothing, it is necessary to consider the "dark side" of technology [8], they are an instrument and as such, they should have empowering and emancipating capabilities. If their introduction is not carefully designed, it is likely to obtain the opposite of the desired effect, with the result of rejecting the user. The forms of participation are facilitated "when the user perceives, from the museum, a welcoming attitude of approach rather than authoritarian teaching." (Bonacini, E 2011) [9] The possibility to prescind from the direct contact with the work of art was anticipated by P. Valéry at the beginning of the twentieth century: "the amazing development of our means, the ductility and the precision they have achieved, the ideas and the habits that have introduced us, guarantee imminent and very profound changes in the ancient industry of beauty "(Valéry 1928) [10].

The democratization process of artistic experience (identified in the last century by Walter Benjamin [11] in the diffusion of film and photography) has been accelerated and increased by the development of contemporary digital technologies. Hence, it represents a risk taking for granted that cultural contents coming from an authoritative source have a value of their own, without deepening the ways in which they are transmitted and valued, with which make them useful and to activate them.

Digitization has given rise to increasingly growth of digital archives of three-dimensional models of works of art. The archive is an extraordinary design tool, it has the opportunity to allow both synchronic and diachronic actions for the narration of memories, to design how to access knowledge.

Archives should be containers of information and knowledge ready to be activated for social and cultural purposes. As a system of knowledge open to multiple uses, reuses and interpretations [12]. The design process in this context can develop projects for different cultural experiences in order to foster the inclusive dimension of historical/artistic assets through archives.

It is therefore crucial to wonder, on one hand, which form archives can take in order to generate new knowledge and involve different audiences; and on the other, how the link between cultural heritage and digital technologies is strengthened in the context of archiving and designing experience.

(1) [www.istitutoeuropeodelrestauro.it](http://www.istitutoeuropeodelrestauro.it)

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