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Franciscan Landscapes

Conservation, Protection and Use of Religious Cultural Heritage in the Digital Era

vol. 2

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This volume collects the papers presented at the concluding conference of the European project 'F-ATLAS: Franciscan Landscapes: The Observance between Italy, Portugal and Spain' that took place in Assisi, May 11-13, 2023.
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Façade of the Basilica di Santa Maria degli Angeli, Assisi (Italy). Drawing by Stefano Bertocci.

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INCLUSIVE HERITAGE COMMUNICATION. INTEGRATED METHODOLOGIES CROSSING 3D PRINTING, MARKETING AND COMMUNICATION FOR THE FRANCISCAN OBSERVANCE CONVENTS

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Abstract

Digitalisation, in all its forms, is nowadays a crucial tool part in the analysis, reproduction, preservation and dissemination of Cultural Heritage. All over the centuries, the human being has invented different mechanisms in order to preserve and transmit cultural values. From writing, painting, photography, architecture and engineering, to the latest technologies such as Additive Manufacturing (AM). Indeed, 3D printing has been increasingly used by experts in the field of cultural heritage. However, how 3D printing can be communicated in order to become a driver for increasing accessibility to cultural heritage? This article proposes a methodology for the inclusive dissemination of cultural heritage, by crossing 3D printing with the field of Marketing and Communication, in order to complete studies in the field of additive manufacturing. The Franciscan Convent of Montecorvino Rovella (Southern Italy) will be the pilot case for the application of the methodology. This is selected due to its peripheral location. First results will allow a more inclusive access to cultural heritage, increasing the knowledge and awareness by the local community.

Keywords: inclusive, heritage, communication.

1. Introduction

The present methodology approaches the use of 3D printing as a way to enrich and complement the communication of cultural heritage, stimulating inclusion and engagement by local (or not) communities, enhancing and promoting knowledge. The challenge is to subvert the relationship between cultural heritage and visitors with new cognitive processes (Meschini, 2011) based on the technological innovations of 3D printing that allow for active experiencing, establishing broader accessibility (Bonacini, 2011). The art historian Elkins (2000) states that visual-tactile arts must provide for a type of fruition in which sight and touch coexist in order to enhance the user's experience.

Moreover, research in the cultural heritage field is moving towards the definition of a shared scientific methodology for communication through Additive Manufacturing, as the integrator of the collected transdisciplinary knowledge.

Indeed, 3D printing paves the way for future scenarios: it will be necessary to adopt a new paradigm, new languages, new products and services as well as to propose a renewed way of accessing and enjoying heritage. Among other things, proper communication based on community building strategies can promote a dialogue with the socio-economic, research and educational worlds.

The proposed methodology aims, on the one hand, to the construction of a communication strategy for cultural heritage, through 3D printing, expanding the scope of this research field and moving beyond discipline-specific approaches, in line with the most recent European guidelines. The inherent multi-sensoriality of the 3D medium can enable access to cultural heritage for a disadvantaged population, based on these parameters: age, educational level, geographic origin, and disability.

On the other hand, the methodology aims to complement existing research on the topic and create the foundations for future research. Previous research on the application of 3D printing to cultural heritage lacks of a communication perspective. The methodology will cover the following steps: i) Critical analysis of the state of the art; ii) Study of 3D printing forms, features and materials; iii) Communication plan; iv) Measurement of results; v) Marketing Personas; vi) Communication methodology.

The research findings will highlight the importance of 3D prototypes as a support for an integrated understanding and inclusive dissemination (or to a wider audience) of cultural heritage assets. Among other contributions, the methodology aims to promote learning opportunities for all by enabling users' accessibility, both physical and cultural, to the assets, and engaging them in an emotional experience of knowledge and exploration.

2. State of Art

Studies on cultural heritage communication, to date, are focused, essentially, on digital technologies. This results in insights for documentation and educational purposes, along with 3D models for virtual visualization and real-time navigation – Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR). Equally, it was possible to ensure accessibility of the historical-artistic heritage to people with disabilities, though, for example, Virtual tours. Moreover, Serious Games (SG) applied to the enhancement of Heritage sites (Bercigli, 2019) represent a learning tool related to the world of cultural heritage (Bellotti et al., 2012; Mortara et al., 2014).

Specifically, the main applications of Information and Communication Technologies (ICT), digital technologies for the representation and communication of historical and artistic heritage, are of various types: outdoor guides, interpretive mediation, storytelling or visual storytelling (cultural heritage narrated through images) and media art/virtual exhibitions with internationally relevant examples of such applications to different projects.

Added to this are immersive perceptual experiences created through Oculus: the user experiences an interactive fruition of the digitally reconstructed space with the ability to orient the gaze 360° and virtually move through the 3D scene (Desai et al., 2014). Likewise, 3D models are denoted that propose a research experience aimed at the construction of acoustic virtual reality environments (Picinali et al., 2014).

Studies on edutainment should be highlighted: cultural heritage between education and entertainment; an extensive, multisensory approach and innovative understanding of the cultural value of the asset in question (Cervellini, Rossi, 2011).

Designing communication that emphasizes accessibility to heritage means implementing targeted and strategic levers to make it qualitatively better for potential users. The solutions adopted to develop the proposed objective have been different, explicated as best as possible although all lacking a shared communicative methodology: promotion of museums with casts of original works, two and three-dimensional reproductions in innovative materials, to scale or full size; APPs and dedicated management software; multisensory stations with tactile and olfactory stimuli; edutainment technologies and establishment of routes designed for an audience with visual impairments.

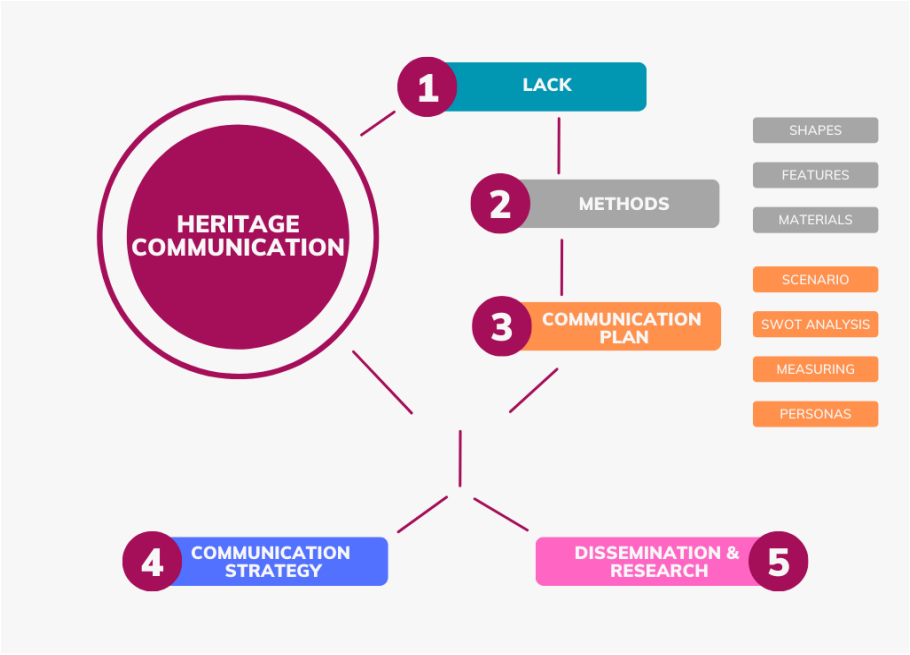
Equally commendable is the project supported by a private research and education organization, Global Digital Heritage (GDH), which is dedicated to 3D documentation of cultural heritage. Using digital visualization, 3D virtualization, geospatial computing and open access solutions, GDH provides digital data and 3D models of places, monuments and collections, to governments, regional institutions, museums, local scholars and general users.

opposite page
Fig. 1
Methodology flow. ©Michele Carucci, 2023.

Although the service provided is in total support of heritage, its management and public access, it lacks, to date, a specific communication strategy.
In the same field of ICT, at present, as far as 3D printing technologies are concerned, they are used for cultural heritage for the purposes of reproduction, reconstruction, transformation and dissemination (Scopigno et al., 2017; Balletti et al., 2017). In terms of reproduction, the goals involve creating replicas to carry out specific research without the risk of damaging the originals (Wachowiak, Karas 2009; Vranich 2018), often creating scale models (Balletti et al., 2016); producing a copy of an artifact missing from archival photography. In terms of reconstruction, 3D printing is useful in processes such as repairing damaged artifacts or components (Arbace et al., 2013). In terms of transformation, on the other hand, it can be useful in the creation of derivative works that include elements, as in the case of audio-tactile experiences (Balzani et al. 2004; D'Agnano et al., 2015).
Finally, several cases of application of 3D prototypes used in learning and communication are denoted (Pantazis,Priavolou, 2017).
Among the few studies that have enabled inclusive access, we note the work aimed at creating an exhibition with 3D models containing tactile pieces for the visually impaired (Neumüller et al., 2014) and the provision of special sensors on the 3D print connected to specific multimedia content viewing systems capable of offering the user a visual-tactile experience (Luigini, Panciroli, 2018).
Beyond these sporadic or specific cases, there is, to date, a gap in the literature, namely the lack of systematic research aimed at identifying a scientific methodology for the communication, addressed to a diverse target audience, of historical-artistic heritage through 3D printing.

3. Methods

A first step (Fig.1) develops a surveys of the different 3D printing methods and techniques, in order to increase accessibility to historical and artistic heritage. Moreover, design scales, prototype colors, and features such as texture, weight, odor, and mechanical specifications will be defined to provide a more holistic appreciation of cultural heritage. New solutions capable of attracting audiences by stimulating curiosity in a simple way and understanding emerging needs for knowledge, insight, and involvement will be scouted. At the end of this phase, summary sheets will be produced that will include the following items: description; type of material and printing technology to be used; design and heritage representations for communication (dimensions, surveys, 3D scanning,isual communication, etc.); aesthetic features; technical specifications.



The development of a database for archiving will be essential for managing data and enhancing the potential of the produced documents. It will also represent a proper tool for future insights and updates, as well as a resource for quick reference and easy specific searches.

Steps of the communication plan, adapted to the research aims, are identified. Firstly, starting from the scenario analysis: geographical and socio-economic contexts that could hinder the enjoyment of historical-artistic heritage. The use of tools, such as the SWOT Analysis, will enable the understanding of elements to focus on, those to be improved, the opportunities in terms of technologies that could favor the achievement of the objective or the threats that could slow it down.

Communication objectives will be identified: i) to understand how to communicate 3D printing as a driver for accessibility to cultural heritage; ii) to survey special features; iii) to bring out the use of the technology, by educating (through the reminder of the existence of this specific service) and retaining users.

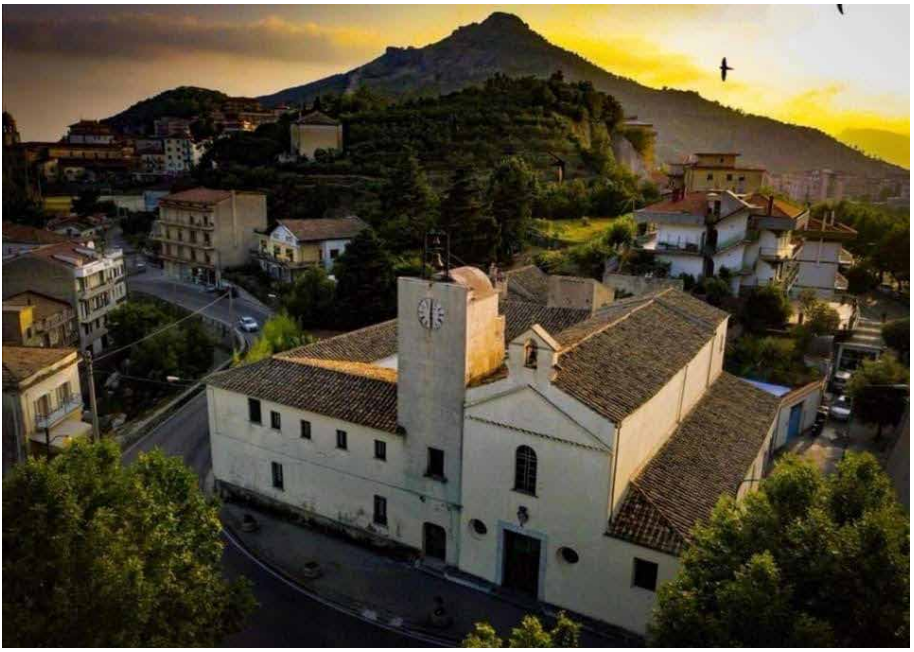
The decisive point, then, will be the identification of target audiences to which communication activities should be addressed. Macro identikits will be produced on the basis of: geographic segmentation, socio-demographic segmentation, user behavior, sought benefits.

opposite page
Fig. 2
The Franciscan Convent of Montecorvino Rovella (Southern Italy). ©Nunzio Di Rienzo, 2019.

Building on it, strategies and related communication styles and content will be drafted.
An integral part of the research will be the contribution of qualitative evaluation methods: an initial brainstorming with experts from different fields will allow the development of a questionnaire to be submitted to the focus group (consisting of the target group surveyed in the previous phase), with the support of local public administrations. Previous contacts and synergies with the last ones will be essential in order to root the research in a concrete territory. During the focus group, users' behaviors, when in contact with 3D prototypes, will be directly observed.
A following phase will define the creation of fictitious personas (minimum of three), with the characteristics of real users of the good/service.
Moreover, in order to facilitate the development of marketing strategies, the creation of personas will serve for the production of personalized contents. This methodology will help in understanding: i) what the potential audience is looking for; ii) how to improve the fruition experience; iii) how to optimize efforts in order to produce the most efficient contents. 3D printing becomes a key support for the recovery of cultural heritage, through its communication, its ability to attract new demand and expand the existing one, and the dissemination of its cultural, social, with a strong impact on the territorial economy and the tourism. The principles of Universal Design and Inclusive Design can be stably adopted, in order to ensure access to the greatest number of people, creating diversified experiences based on key factors.
At this stage, the ability to design and consider a friendly fruition, and an easy logistics, will be crucial. This can take place through: in loco exhibitions, awareness days, set-ups in strategic areas (municipal museums), en plein air events in major squares. Best practices will be incorporated as deemed valuable in the course of the in-depth studies (example: storytelling and edutainment). Moreover, the ability to design and consider logistically simple fruition at this stage will be crucial: location exhibitions, awareness days, installations in strategic areas (e.g., municipal museums), open air events in major squares. Specific techniques, such as storytelling and edutainment, will be considered.

4. First Conclusions

This article represents the first step in the investigation of 3D prototypes as support for an integrated understanding and inclusive dissemination of built cultural heritage. In the specific case, the first draft of a theoretical framework is carried out.
This will be applied to a specific case study, the Franciscan Convent in the municipality Montecorvino Rovella (Southern Italy) (Fig. 2).



This framework emphasizes how the needs for an interdisciplinary (crossing Art with Communication, Marketing, Architecture, and ICT) and intersectoral team, promoting synergies between universities, administrations (at different levels, such as local, regional and national), and the local community. Regarding the last actor, the proposal promotes also learning opportunities, by enabling physical and cultural accessibility of users to cultural heritage, and, simultaneously, engaging them in an emotional experience of knowledge and exploration. In this way, the right to be part of the cultural heritage, benefitting from it, and contributing to its enrichment, allows local (or not) community to play an active role in recognizing both tangible and intangible values.

Futures research will show the application of this framework to the identified specific case study.

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Integrating historical research with technological progress opens exciting possibilities to create comprehensive digital archives, virtual reconstructions, and immersive experiences that can bridge the gap between the past and the present.

Stefano Bertocci is Full Professor at the Department of Architecture of the University of Florence. He led numerous research projects on the opportunities offered by 3D digital surveys and remote sensing in archaeology, architecture, and urban planning. His major works include research on Architectural Heritage in Europe and Latin America, wooden architecture in Russia and investigations of various archaeological sites in Europe and the Middle East.

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