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Sommario

Digital documentation for the accessibility and communication of two Franciscan Observance convents

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Franciscan Observance
Cultural Heritage
Remote Accessibility
Virtual Tour
Tactile Map

Osservanza Francescana
Patrimonio Culturale
Accessibilità da remoto
Tour virtuale
Mappa tattile

The research is carried out in the context of the European project F-ATLAS, whose objectives include documenting the material and intangible heritage of the Franciscan Observance in Europe. This paper focuses on the possibilities offered by digital documentation to create tools for the dissemination and accessibility of the Franciscan Observance heritage. The two case studies have been selected for their particular characteristics, linked to the historical context of the Observance, the landscape-territorial context and their current use. The idea examined for the first case study is to allow individuals with reduced mobility to access virtually all the conventual spaces that are physically not accessible, solving the issue in a non-invasive way, exploiting the potential offered by the use of digitally acquired data to create a virtual tour. In the second case, the problem of the inability to access a site classified as a Portuguese National Monument was addressed. Thus, a temporary modular exhibition pavilion was designed to contain installations that provide information on the history and architectural development of the convent and fortress and can also be used by blind and visually impaired people.

La ricerca è condotta nel contesto del progetto europeo F-ATLAS, i cui obiettivi comprendono la documentazione del patrimonio materiale e immateriale dell'Osservanza Francescana in Europa. Il presente lavoro si concentra sulle possibilità offerte dalla documentazione digitale per creare strumenti per la diffusione e l'accessibilità del patrimonio dell'Osservanza Francescana. I due casi di studio sono stati selezionati per le loro caratteristiche particolari, legate al contesto storico dell'Osservanza, al contesto paesaggistico-territoriale e al loro utilizzo attuale. L'idea presa in esame per il primo caso di studio è quella di consentire alle persone con mobilità ridotta di accedere virtualmente a tutti gli spazi conventuali fisicamente non accessibili, risolvendo il problema in modo non invasivo, sfruttando le potenzialità offerte dall'uso di dati acquisiti digitalmente per creare un tour virtuale. Nel secondo caso, è stato affrontato il problema dell'impossibilità di accedere a un sito classificato come monumento nazionale portoghese. È stato quindi progettato un padiglione espositivo modulare temporaneo che contiene installazioni che forniscono informazioni sulla storia e sullo sviluppo architettonico del convento e della fortezza e che può essere utilizzato anche da persone non vedenti e ipovedenti.

Introduction

This article is part of the research carried out within the European Project F-ATLAS, one of the winning projects of the JPI-CH 2019 call. F-ATLAS aims to study the conventual complexes of the Franciscan Observance and their landscape context between Italy, Spain, and Portugal. The research exploits historical and archival sources and integrated digital survey methodologies to document and study the network of Observant convents and the routes that connect them for their conservation, protection, and enhancement.

In particular, the text summarises the results obtained and discussed in two theses: one is aimed at creating a multi-functional portal dedicated to the convent of the Eremo delle Carceri (in Assisi, Italy), and the other at making an exhibition pavilion dedicated to the convent and fortress of Santa Maria da Insua (in Caminha, Portugal).

The research focused on the possibility of using data obtained from integrated surveying techniques and historical documentation to create valuable products for the dissemination and accessibility of the two conventual complexes.

The two conventual complexes

The two case studies have been selected for their particular characteristics, linked to the historical context of the Observance, the landscape-territorial context and their current use.

Eremo delle Carceri is located near Assisi, Italy. It was built on Mount Subasio in the thirteenth century and developed around a pre-existing Marian chapel and the caves in which s. Francesco and his companions had been secluded. In 1373 it was donated to Paoluccio Trinci, initiator of the Observant movement, and was enlarged by Trinci and Bernardino da Siena between the late 1300s and the early 1400s. Further enlargements occurred during the XV-XVI, XVIII and XX centuries [Di Giampaolo 2013; Mercurelli Salari 2013]. Currently, the convent is a concession to the Order of Friars Minor and, in addition to being a destination for religious tourism, is integrated into the main hiking trails that cross the Park of Subasio [1]. It has been recognised as UNESCO's World Heritage site since 2000.

Cover Image
On the left, a screenshot of the virtual tour of the Eremo delle Carceri. On the right, a detail of the tactile map of Santa Maria da Insua. Credits: F-ATLAS project.

The convent of Santa Maria da Ínsua was built on an islet located south of the mouth of the river Minho, near Caminha, in Portugal. It was founded in 1392 by a group of Franciscan Observants from Spanish Galicia [Teixeira 2010; Rodrigues et al. 2020]. In the mid-17th century, it was surrounded by a fortress. Franciscans were forced to leave the convent in 1834 due to the Portuguese dissolution of the religious orders. Despite the fortress and the convent being classified as National Monument in 1910, the building is currently in a complete state of abandonment and public access to the fort's interior is prohibited. In 2016, the fortress and the convent were included in the list of properties to be leased by the Portuguese state to private individuals: the selected project foresees the installation of a lodging establishment. Construction adaptation will start in 2022-2023 [Becherini et al. 2022] (fig. 1).

Research goals

Through the digital documentation of the Eremo delle Carceri, some issues regarding accessibility were highlighted, both within the conventual complex and along the paths inside the surrounding wood. Due to the spatial distribution of the convent spaces, resulting from the volumetric increases made over time and the adaptation of the architecture to the topography of the place, there are many steep gaps and narrow passages. Some of these criticalities could be fixed by installing removable ramps —with slope and dimensions compliant with the regulations— still, some conventual areas are connected via paths that have strong gradients mediated by irregular steps or passages less than 70 cm or reduced in height and width. The idea examined in the thesis was to allow individuals with reduced mobility to access virtually all the spaces that are physically not accessible, solving the issue in a non-invasive way [Cottini 2022].

In the second case, the problem of the inability to access a site classified as a Portuguese National Monument was addressed. Since the entire islet where the convent of Santa Maria da Ínsua is located will soon be transformed into a four-star lodging establishment, public access is expected to be strictly limited. For this reason, digital documentation methodologies have been used to record the current state of the

architectural objects before their renewal to allow remote access. The research during the thesis focused on designing a temporary modular exhibition pavilion that can be installed near the islet on the Caminha waterfront. This pavilion contains installations that provide information on the history and architectural development of the convent and fortress, designed so that blind and visually impaired people can also use them.

Data collection

Integrated digital survey campaigns were carried out for both convents, with methodologies provided by the F-ATLAS project and consolidated within the research team [Becherini et al. 2022; Adamopoulos, Rinaudo 2021; Bertocci et al. 2020; Pancani 2017]. Digital surveys were done with LIDAR and photographic (aerial and close-range) instrumentation of the internal and external spaces of the two convents and the surrounding context to obtain reliable morphological and dimensional data. At the same time, bibliographical and archival research was carried out aimed at gathering historical information about the evolution of the conventual complexes over the centuries and their relationship with the events concerning the movement of the Franciscan Observance [Salvestrini et al. u.p.; Rodrigues et al. 2020].

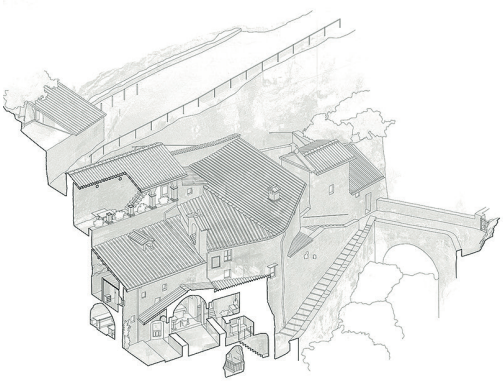
The raw data obtained were subsequently processed in line with the specific objectives of the F-ATLAS project (fig. 2).

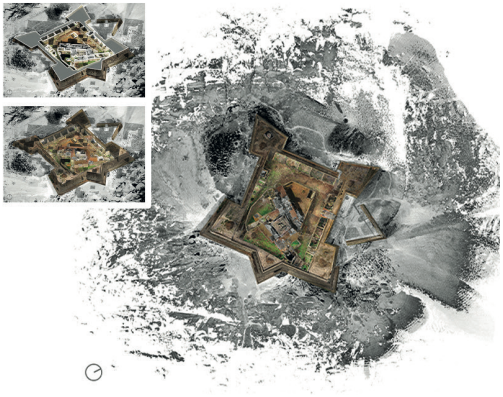
Data elaboration - The two projects

The proposal developed for the Eremo delle Carceri consists in the design of an interactive portal - accessible both remotely via the web and on-site via touch-screen totems - that collects data of different kinds: a section with the virtual tour of the conventual spaces and other sections with historical and geographical information, multimedia materials and information on how to reach the place. The data collected through *in situ* and archive research activities have been discretised and integrated to obtain a synthesis and a graphicisa-

Fig. 1.
On the left, an aerial view of the Eremo delle Carceri with the surrounding Sacred Wood. On the right, an aerial view of the islet where the convent and fortress of Santa Maria da Insua are located. Credits: F-ATLAS project.

Fig. 2.
On the left, an axonometric split of the Eremo delle Carceri. On the right, plan and axonometric views of the convent and fortress of Santa Maria da Insua. Credits: F-ATLAS project.



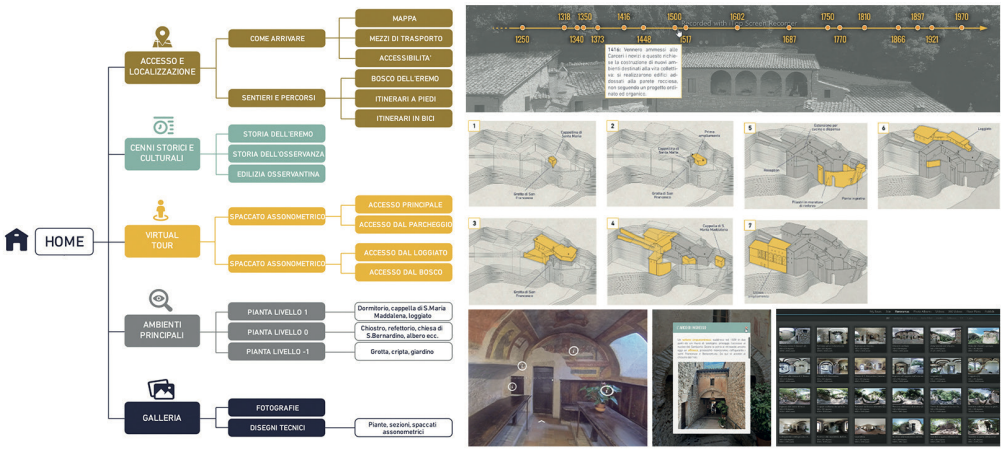


tion of the information that can be intuitively enjoyed by a 'generic' user, not specialised in any particular sector. In the design of the portal was taken as a reference the experience design model proposed by Garrett. This pragmatic model puts the user, his expectations and choices at the centre of all stages of product development [Tosi 2018; Garrett 2011]. The historical information has been summarised, accompanied by images and distributed along a timeline that highlights the years corresponding to events relevant to the history of the Eremo. The evolutionary phases of the convent were represented by three-dimensional models rendered in such a way as to show the progressive growth and change over time of the buildings of the convent. The information regarding the accessibility to the place has been divided into two secondary screens with interactive maps: one dedicated to the access methods and one to the cycling-pedestrian paths in Subasio Park and the Sacred Wood of the Eremo. For the virtual tour were used various spherical photographs that, connected to each other according to a defined path, show the succession of the external and internal environments of the Eremo, with interactive info boxes that give access to additional information about the decorative apparatus or the history of the settings in which they are inserted (fig. 3). As stated before, the virtual tour —by simulating the 360° vision— is crucial to allow individuals with reduced mobility to access virtually the spaces that are not physically accessible [Cottini 2022; D'Acunto, Friso 2022].

The design of the pavilion dedicated to the convent and the fortress of Santa Maria da Ínsua responds to the need to preserve the memory of a heritage that, in addition to being in a state of decay, will shortly be radically transformed and no longer accessible. A pavilion consisting of four identical modules was designed to create a path that tells visitors about the history of Santa Maria da Ínsua and provides information about the thematic routes that connect it to other regional and national points of interest [2]. The modules that make up the pavilion are composed of mobile panels, which allow changing their appearance according to specific needs — the layout also recalls the idea of a path, rather than a limited space, in dialogue with the surrounding area. This makes it easy to adapt the pavilion to current accessibility requirements (fig. 4).

Fig. 3.
On the left, the wireframe of the portal structure - on the right, some examples of information graphicisation. Credits: C. Assirelli, F-ATLAS Project.

Fig. 4.
The pavilion inserted in the context of the beach of Moledo. Credits: L. Perrotta, F-ATLAS Project.


HOME
ACCESSO E LOCALIZZAZIONE
COME ARRIVARE
MAPPA
MEZZI DI TRASPORTO
ACCESSIBILITA'
SENTIERI E PERCORSI
BOSCO DELL'EREMO
ITINERARI A PIEDI
ITINERARI IN BICI
CENNI STORICI E CULTURALI
STORIA DELL'EREMO
STORIA DELL'OSSERVANZA
EDILIZIA OSSERVANTINA
VIRTUAL TOUR
SPACCATO ASSONOMETRICO
ACCESSO PRINCIPALE
ACCESSO DAL PARCHEGGIO
SPACCATO ASSONOMETRICO
ACCESSO DAL LOGGIATO
ACCESSO DAL BOSCO
AMBIENTI PRINCIPALI
PIANTA LIVELLO 1
Dormitorio, cappella di S.Maria Maddalena, loggiato
PIANTA LIVELLO 0
Chiostro, refettorio, chiesa di S.Bernardino, albero ecc.
PIANTA LIVELLO -1
Grotta, cripta, giardino
GALLERIA
FOTOGRAFIE
DISEGNI TECNICI
Piante, sezioni, spaccati assonometrici
1250
1318
1340
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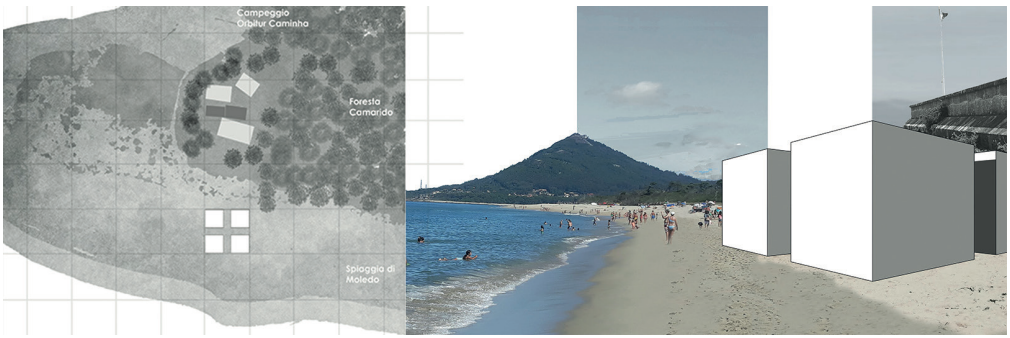

Campeggio Orbitur Caminha
Foresta Camarido
Spiaggia di Moledo

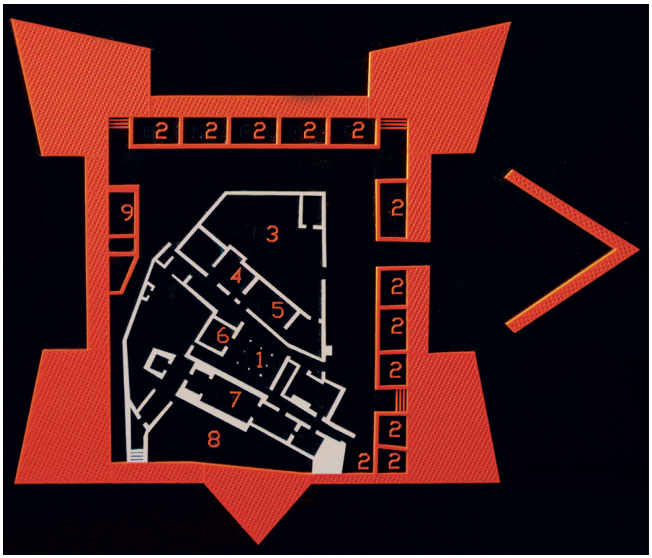
In particular, the project focused on the design of a tactile product that would allow the blind and visually impaired to explore the spaces of the convent and the fortress, understand the relationships between the buildings and acquire information on the original uses of the rooms: a tactile map with different laser-cut plexiglass layers. The data obtained from the digital survey were used to draw a plan of the ground floor of the architectural complex, simplifying and schematising the wall profiles to allow the blind to generate a mental image of the architecture represented [Riavis, Cochelli 2018]. The fort, including military cells, is realised through a red plexiglass plate, visually contrasting with the white plate with which the convent is represented and the black background plate. The fortress is distinguishable to the touch from the convent by applying a pattern (fig. 5). The different functions of the fortified and conventual spaces are identified using numbers in Arabic numerals and Braille, accompanied by a panel containing the labels. This allows blind and visually impaired people to distinguish the functions of the different architectural spaces: through the patterns different to the touch and the Braille labels for the first group, through the strong colour contrasts for the second one [Riavis, Cochelli 2018]. In the design of the tactile map were taken into account some considerations of ergonomic nature, referring to the threshold for the tactile sensation, which influenced the choices made regarding the synthesis of the data and the dimensioning of the product [Tosi 2009] (fig. 6).

Fig. 5.
On the left, the tactile map of the convent and fortress of Santa Maria da Insua. On the right, some details of the map show the different tactile patterns used. Credits: L. Perrotta, F-ATLAS Project.

Fig. 6
On the left, the plan of the convent and fortress of Santa Maria da Insua obtained from the digital survey. On the right, the simplified plan used for the tactile map. Credits: L. Perrotta, F-ATLAS Project.

Conclusions

This historical moment is characterised by the increasingly predominant presence of technology and digital tools in everyday life. The radical transformation of the communication systems has also interested the world of art and culture in general, creating new and increasingly complex systems of narration and use of the tangible and intangible contents based on perception and remote activities of users. Virtual digital tools aim to widen the spaces and the means for the diffusion of knowledge considerably, without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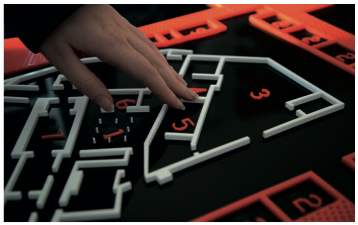

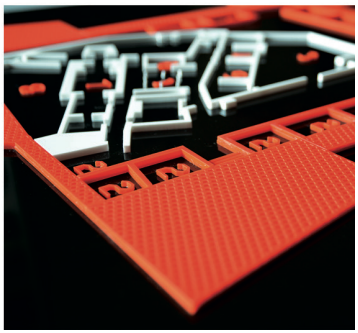

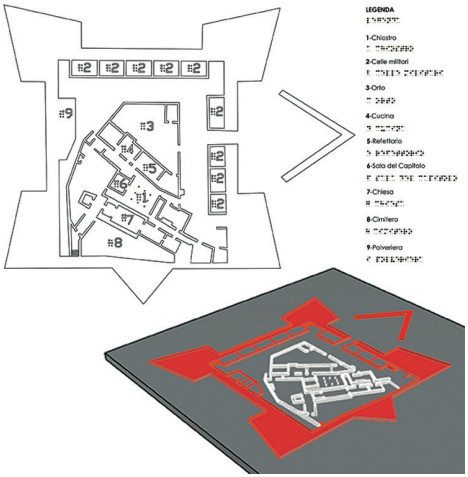
LEGENDA
1-Chiostro
2-Celle militari
3-Orto
4-Cucina
5-Refettorio
6-Sala del Capitolo
7-Chiesa
8-Cimitero
9-Polveriera

trying to substitute the real experience but by working alongside it [D'Acunto, Friso 2022]. The complex background of the so-called Virtual Museums correlates with art and technological development by focusing on man's needs to discover, study, enjoy, and live his Heritage. It needs a combination of operations such as scientific digitisation — fundamental to generate a virtual facsimile of the good, the design of access to the digital good, the study of User Experience, and the training of specialised personnel necessary to implement and manage the digital Heritage [Clini et al. 2022].

Moreover, specific aids —particularly tactile tables and other typhlodidactic materials— promote an accessible and direct approach to Cultural Heritage to visitors with visual and auditory disabilities, with a view to the integration and active participation of different audiences [Bruno 2019]. Also, in this case, the support of digitalisation is of fundamental importance for the realisation of physical prototypes that constitute a form of helpful tactile representation to extend the accessibility and usability of the heritage (for example, tactile maps, perspective bas-reliefs, 2.1D, 2.5D and 3D models) [Sdegno, Riavis 2020].

Therefore, it is possible to state that by exploiting the potential offered by digital documentation combined with historical research, graphic and textual materials can be obtained that, appropriately selected and processed, prove to be valid for the creation of helpful content both as a support to the experience of discovering and knowing Heritage and as a tool to facilitate its accessibility for people with disabilities.

Note

[1] See, for example, the numerous routes reported among the results obtained through the Wikiloc search engine (https://it.wikiloc.com/) using the terms "eremo carceri".

[2] The peculiarity and location of the architectural complex have provided interesting ideas for the hypothesis of a series of thematic hiking trails linked to the Santiago Way, the network of the first convents of the Portuguese Observance, or the fortresses along the Portuguese coast.

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The digital surveys of Eremo delle Carceri were done in August 2020 by S. Bertocci, F. Cioli, A. Cottini, M. Bercigli, P. Becherini of the University of Florence and F. Ferrari and M. Medici of the University of Ferrara.
The digital surveys of Santa Maria da Insua were done in September 2021 by P. Becherini and A. Cottini of the University of Florence.
The design hypothesis and the images, where indicated, were made by C. Assirelli as part of the thesis "*Progetto di una piattaforma digitale per la valorizzazione e la fruibilità dell'Eremo delle Carceri ad Assisi*", relatore S. Bertocci, correlatore A. Cottini - Università degli Studi di Firenze, Scuola di Architettura, CdL Triennale in Scienze dell'Architettura (December 2021), and by L. Perrotta as part of the thesis "*Nel segno di un ricordo - Il rilievo digitale integrato per la valorizzazione del convento di Santa Maria da Insua*", relatore S. Bertocci, correlatore A. Cottini - Università degli Studi di Firenze, Scuola di Architettura, CdL Triennale in Scienze dell'Architettura (July 2022).

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