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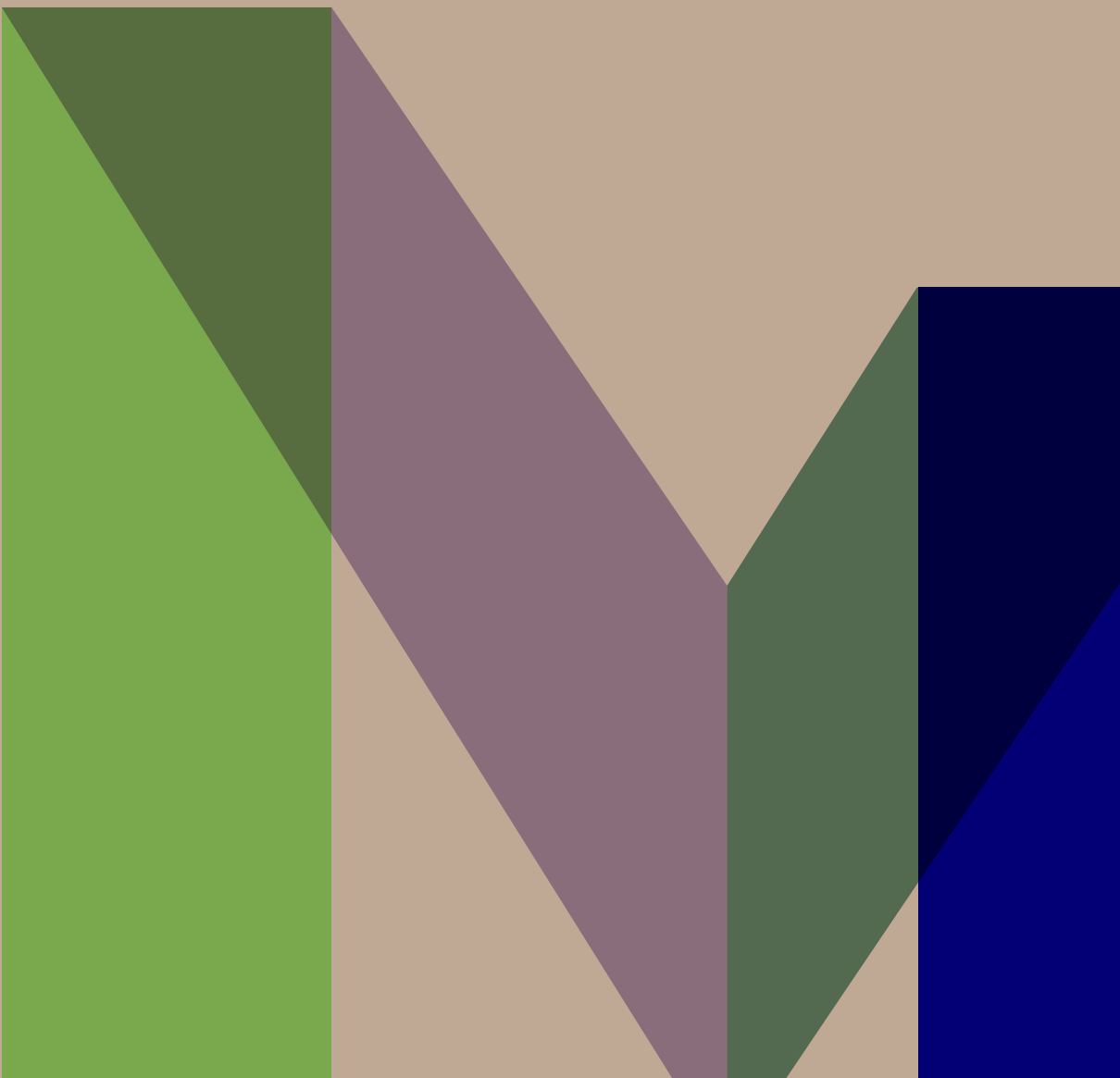

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[re]constructions

edited by Franz Fischer, Diego Mantoan, Barbara Tramelli

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Setting the Frame for Digital and Public [Re]constructions as the Very Soul of a Scholarly Enterprise

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1 Coming of Age (in Theory) and Paving New Ways (in Practice)

The present issue closes *magazén*'s third annual volume, which presented a total of twelve original papers from international scholars who devoted their attention to the schemes and models of research that are defining our scholarly domain and revolving around the practice of [re]construction.[1] In doing so, we hope to prove that Digital and Public Humanities' vocation is grounded both in creativity and scientific rigour, thus highlighting an attitude that *de facto* blends humanities with speculation, intuition, and invention (Jenkins 2004). As becomes evident in this issue, the particular concept of '[re]constructions' we focused on was spontaneously met by numerous scholars that responded to our call for papers, offering insights into a varied array of cross-disciplinary domains – ranging from historical, societal, cultural, philological, artistic to archaeological studies – which turn this principle into a true cornerstone of recent research pro-

1 This introduction paper was mutually agreed on by the authors who acted as curators of *magazén*'s volume 2022, divided in two issues, with the help of the journal's editorial board.

jects in the field of digital and public humanities (Dupré et al. 2020). The theoretical reflections and case studies summed up in this issue go even further, connecting digital tools for reconstruction purposes with a steady openness of their scientific outcome, such as to make the public delivery of results an intrinsic step of these modes of research (Beacham, Denard 2003). Hence, every analytical endeavour is tightly knit together with a lure for public display that allows scholars as well as the wider audience to appreciate the [re] configuration of lost realities, the [re]creation of long gone dimensions, the [re]building of likely scenarios, and the [re]covering of disappeared traces.

Most conveniently, this year's last issue comes also at the end of the Excellence Initiative (Progetto d'Eccellenza) that fed and carried the Venice Centre for Digital and Public Humanities over a few years, funded by the Italian Ministry of University and Research. Henceforth, it truly represents the legacy of that seminal period which brought together enthusiastic minds and sensibilities from around the world to Ca' Foscari University of Venice, in order to kick-start a durable research outpost in the Digital and Public Humanities, as well as a wide network of collaborating scholars. The activities developed and the relations activated in these truly frantic years speak numbers and stand for themselves: the centre is running a unique international master programme in Digital and Public Humanities, by now in its third year. A biennial summer school was held for the first time in presence in Venice in collaboration with numerous local GLAM institutions such as La Biennale di Venezia, the Fondazione Querini Stampalia, Palazzo Grimani and M9, a museum narrating the Italian 20th century with immersive environments and multimedia technologies, but also with independent activists and organisations such as S.a.L.E. DOCKS. The call for applications attracted more than 160 candidates from all over the world of which only a number of 25 participants could be invited. As one outcome of the summer school, an uncurated virtual exhibition of the Tetrarchs and Arsenal Lions *Hidden in Plain Sight* was launched in November 2022, running until January 15, 2023.[2] Another core activity of the centre has been to raise competences and capacities of doctoral students and advanced researchers regarding essential methodologies for digital scholarship and public engagement as well as emerging technologies related to linked open data, semantic web, computer vision, handwritten text recognition to name just a few. At the heart of numerous collaborative projects there is a team of research software engineers ded-

2 *Hidden in Plain Sight. An (Un)curated Exhibition on the Tetrarchs and Arsenal Lions of Venice.* Virtual Exhibition curated by Elisa Corrò and Francesca Dolcetti: `https://www.unive.it/data/33113/2/68377`.

icated to developing and enhancing tools and applications (e.g. Cadmus, Euporia) in order to facilitate datafication, content creation and analysis for very specific domains in various humanities disciplines. After three years of productivity, the Venice Centre for Digital and Public Humanities is an internationally renowned competence hub connected to and integrated into scholarly networks and infrastructures, visible not least by the fact that since October 2021 the VeDPH and the Institute for Computational Linguistics "Antonio Zampolli" of the National Research Council of Italy (CNR-ILC) collaborate as an officially recognised CLARIN Knowledge Centre for Digital and Public Textual Scholarship.[3]

This journal, too, comes as one of the legacies of the excellence project developed over the last few years and will henceforth continue to build upon the network created among international scholars, particularly to offer an open platform for theoretical debates, methodological reflections, and case studies. Though it will not be the only enterprise that continues to flourish from the Venice Centre for Digital and Public Humanities. Very much so, the experience of *magazén* convinced us that there was the necessity to offer another platform to disclose even wider projects, thus paving the way for a special book series, again with Edizioni Ca' Foscari in open access. Indeed, the new book series starts in parallel to this last journal issue and we are proud to announce that the first volume is already online.[4] Titled *Disclosing Collections: Studies, Catalogues and Data in the Arts and the Humanities*, the series intends to complement the journal, focusing on practical examples and specific research projects in connection with institutions in the GLAM sector. Inspired by the process of scientific analysis and contextual public disclosure of collected materials in the wider Humanities, this academic book series aims at establishing a paradigmatic practice in producing catalogues, inventories, indexes, collection displays, data sets, and item lists. The series is grounded on the idea of both mapping and disclosing unprecedented territories, which are then left with infrastructures that allow them to be available for the research community and the wider public. In this sense, the series intends to go beyond traditional concepts such as the 'catalogue raisonné' or full inventory lists, rather trying to present publications in print and digital form that cut across a given collection of items and thus highlight categorisations, interconnections, and relevance attribution. Of particular importance is the methodology applied to the production of the finalised publication, which takes into account recent interdisciplinary stances, modes of research, and forms of presentation prompted by

3 DiPText-KC: https://diptext-kc.clarin-it.it/.

4 http://doi.org/10.30687/2974-5276.

scholars in the Digital and Public Humanities, particularly the development and importance gained by relational databases. The scope of the series embraces the entire array of the Humanities: from textual scholarship to history, from art history to cultural heritage, from archaeology to archival studies. A distinctive feature of the series is its institutional interconnectedness, since publications are each the unique product of intense and planned collaboration with specific museums, libraries, collections, archives, estates, excavations, field works, and research institutions. Our thanks go to the many scholars of international renown who accepted to be part of *Disclosing Collections*' Advisory Board and will help us to shape this new and exciting enterprise. The series is open to proposals and we will be glad to receive feedback or note of projects. With this book series our *magazén*, as the public house was called at the time of the Venetian Republic (Tassini [1863] 1970, 364-5), is being enriched in the years to come with a new front row table for scholars to take their seat and play their cards.

2 Models and Modes of Reconstruction and New Construction

The papers chosen for the second issue of the present volume address the theme of [re]constructions from different angles, taken from diverse perspectives and disciplinary backgrounds on specific materials and objects of individual case studies.

The first contribution by James Cook and Sophia Mirashrafi analyses the reconstruction of visuals and acoustics of the now-ruined Linlithgow Palace chapel, a truly cutting-edge project – *Space, Place, Sound, and Memory: Immersive Experiences of the Past* – in which the research team was able to virtually recreate not only the sacred environment but also the atmosphere in which the liturgical music was played, reinterpreting a historically informed musical performance within the palace. The authors discuss the conceptual issues of reconstruction and recomposition based on fragmentary evidence and the use of rebuilding likely scenarios for both research and cultural heritage institutions. The second article by Goki Miyakita examines the case study of the Keio University Museum in Japan, which offers a digital-analogue fusion of the dispersed physical museum collection. Miyakita discusses in detail the research process that led to the creation of the digital museum, embedding the analysis into the wider context of digitisation of collections and exhibitions following the COVID pandemic, and the need for accessibility to enhance the potential of existing (and future) museum realities. The third contribution of the present issue reflects on 3D reconstructions in the GLAM sector from a theoretical point of view. Angelica Federici anal-

yses the methodological implications of virtually reconstructing archaeological artefacts from the Middle Ages critically evaluating the impact on digital conservation practices in the cultural heritage sector regarding both scientific and pedagogical aspects. The fourth article by Monique Bellan departs from the question whether the digital can create more visibility for modern art from the Arab region, revising the modern art boundaries and ultimately leading (ideally) to a de-canonisation of art which includes artists and artworks traditionally excluded from the art canon. Her take on [re]constructing art knowledge through digital means is a challenging one, which certainly opens up new threads for discussion and lays out a methodology for the construction of relational databases in a collaborative environment. The fifth paper by Valeria Finocchi and Marco Mazzocco analyses in detail the impact of the COVID pandemic on the practices of museums storytelling in the context of social media, taking as an exemplary case study Palazzo Grimani in Venice. The curators of the museum discuss the difficult situation experienced during the pandemic, and the strategies that were used in order to substitute a real on-site visit, thus leading to a [re]construction of meaning around cultural heritage based on the involvement of the public via social media and shared practices. In the last contribution, Konrad Szuba discusses the [re]construction of the sacred urban space in Warsaw after the second northern war (1655-60), explaining the modification in urban space based on the Urban ontology. In doing so he reconstructs the changes taking place within the space of Warsaw between the late Middle Ages and the beginning of the twentieth century.

We cannot but finish with a heartfelt thanks to all scholars and experts that participated in this issue: our Advisory Board members, the selected contributors, the many peer reviewers, all members of the Editorial Board, and the magnificent team of our publishing house.

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Point Cloud to Sound Cloud
Digital Innovation and Historic Sound at Linlithgow Palace

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Abstract The *Space, Place, Sound, and Memory: Immersive Experiences of the Past* project was led by dr James Cook, in collaboration with the Digital Documentation and Innovation team at Historic Environment Scotland, Soluis Heritage, the Binchois Consort, and scholars at the universities of Birmingham and Melbourne. It used cutting-edge technology to reconstruct the visuals and acoustics of Linlithgow Palace chapel, before situating reconstructions of liturgical music within it. Beginning with HES' 3D scan of the chapel, the project then used archival, archaeological, and musicological research to bring to life the sights and sounds of the 16th-century chapel. This chapter explores how Digital Documentation can be harnessed in the production of innovative interpretation and research material.

Keywords Linlithgow Palace. Chapel. Digital heritage. Laser scanning. Digital documentation. 3d model. Reconstruction. Virtual. 3D. Technology. Acoustic. Music. Archaeological. Musicological. Sound. Audio. 16th century. Virtual reality. Interpretation.

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1 Introduction

This essay discusses aspects of a recent AHRC-funded research project entitled *Space, Place, Sound, and Memory: Immersive Experiences of the Past*, and its impact and engagement follow-on *Hearing Historic Scotland*, which was carried out in collaboration with Historic Environment Scotland (HES), The Binchois Consort, Soluis Heritage, and Hyperion Records. This project sought to use a combination of terrestrial laser scanning, undertaken by HES's Digital Documentation and Innovation team, virtual reality (VR), and acoustic reconstruction to interpret a historically informed musical performance within the context of a now-ruined building: the Chapel Royal at Linlithgow Palace.

At the heart of this project were many of the conceptual issues that have been envisaged as central to the themed essays within these two volumes, especially the idea of reconfiguring lost realities, rebuilding likely scenarios, and recovering disappeared traces of historical and cultural value. Almost all aspects of this project – the visual, the acoustic, and the musical – involved quite literal reconstruction and recomposition, piecing together fragmentary evidence into something that could serve at once as a site for the interrogation of further research questions, and as an attractive aid to visitor interpretation in a popular heritage setting.

2 Historical Context

2.1 The Palace

The ruins of Linlithgow Palace, cared for by Historic Environment Scotland, currently cling to the peel above the loch which sits at the centre of the historic royal burgh of Linlithgow (see figure 1 for a map which situates this in relation to Edinburgh) **[fig. 1]**. Even in its ruined state, the palace has its own charm, immortalised, for instance, in JMW Turner's 1806 oil-on-canvas painting, which currently hangs in the Walker Art Gallery, Liverpool. Before its ruination, it was the magnificent pleasure palace of the kings and queens of Scotland, its building work having been started in 1424, by King James I, on the site of an earlier building of rather more military significance. Perhaps most famous as the birthplace of both James V and Mary Queen of Scots, it underwent a number of layers of building work under various monarchs, before falling out of favour and into disrepair. On September 6 1607, the north range, already noted as being in poor condition in 1583 (Paton 1957, 311) and ruinous in 1599 (Calendar State Papers 1969, 623), collapsed (Maidment 1844, 369), though it was later rebuilt between 1618 and 1622 on the orders of King James VI/I

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(Burton 1895, 335). Despite this, it never again served as a frequent home for royalty – King James never returned and the last reigning monarch to reside there was King Charles I, for a single night in 1633. By October 1641, an English visitor noted that the roof of the great hall was no longer present, and that the grand fountain had been vandalised, and by 1668 it was once again described as a ruin. The palace's fate was sealed on the night of 31 January 1746, when troops of the army of the Duke of Cumberland, who were quartered there, accidentally started a fire which destroyed much of what remained (Bateson et al. 1904, 275).

Figure 1 A map showing Linlithgow Palace in relation to Edinburgh. Timothy Pont and Hendrink Hondius, *A New Description of the Shyres Lothian and Linlitquo*. Amsterdam: H. Hondius, 1630. National Library of Scotland, EMS.s.676. Reproduced with the permission of the National Library of Scotland

The difficulty of conveying the lost interiors of ruined buildings is something well-known to heritage researchers,[1] and arguably exacerbated in Scottish heritage. There is a clear historiographical trend which treats Scotland as culturally lacking in comparison to England, and indeed the rest of the world. This has a distinct history in academic literature which may arguably be seen as dating back to Anthony Weldon's account of James VI/I's progress to Scotland whose, in the words of Wormald (1983), "brilliant and deeply biassed character sketch" which "arose out of a hatred for the Scots … has never quite failed to influence later attitudes to James I" (191-2). Similar trends may be seen in the early reception of the king in Peyton's (1652) *Divine Catastrophe of the Kingly Family of the House of Stuarts*, or the less polemically titled, but still overtly critical Wilson's

1 An issue which is incidentally often directly confronted in the digital heritage sphere, as an example with further discussion here see: Brůha et al. 2020.

(1658) *History of Great Britain, Being the Life and Reign of King James I* and Osborne's (1658) *Historical Memoirs of the Reigns of Queen Elizabeth and King James*. This reception has carried into the middle of the twentieth century in Wilson's (1956) *King James VI and I*, even if it is becoming more balanced in recent literature.[2] The idea of the barbaric northern king being foisted on the more cultured southern lands seems to have rubbed off on reception of the land of James' birth more generally. This historiographical lens, which has tended to diminish Scotland's artistic and cultural output, has been further focused through more recent historiophotical means (to borrow Haydn White's formulation of the construction of historical narrative through image rather than the written word). Scotland boasts, of course, an overabundance of Castles which are, in the main, in a state of ruin. This makes it a particularly common venue for filming of historical and fantasy drama. The historiophotical issues this can engender can be illustrated by considering the recent films *Mary Queen of Scots* (2018), *Outlaw King* (2018), or the TV series *Outlander* (2014-). They all seek an air of 'authenticity', both to their historical and geographical subjects, by filming on location at a number of Scottish castles and palaces, including Linlithgow Palace, and Blackness, Doune, and Craigmillar Castles. These locations are presented in their current ruined states, with bare stone walls, and sometimes lacking ceilings and windows. Even if the absolute state of their ruination is somewhat covered by clever camera work, they still leave the prevailing sense that the pre-modern interior of the important dwelling places of the temporal and spiritual magnates of Scotland were dark, dingy, draughty and undecorated. In short, pre-modern Scotland was ruined by design, rather than by time.

Our project therefore sought to use cutting-edge technology to provide a visitor experience which would emphasize the visual splendour that once characterised Linlithgow Palace. It also attempted two rather more musicological ends – i). to combat the prevailing sense, often given by heritage sites, that these buildings were historically silent,[3] and ii). to attempt to address the common misconception, given by modern concert and recording conventions, that music of this period was heard and should be heard in cavernous acoustics.

2 See, for instance, Stewart 2003, a popular biography which makes copious use of primary sources to redress some of this balance, or Rhodes, Richards, Marshall 2003, which demonstrates his contribution as a writer and patron.

3 This problem is perhaps emphasized for Scotland, which is often overlooked by musicologists interested in early music. Consider, for instance, Harrison's (1958) *Music in Medieval Britain*, which makes almost no mention of Scotland.

2.2 The Music

For this project, we chose to centre our reconstructed event around the celebration of Easter in 1512. This was largely to cover the fragmentary nature of the surviving musical repertoire from this period, and indeed more generally in Scotland. Pre-reformation Scotland can boast only three substantially complete surviving musical sources:[4] D-W Cod. Guelf. 628, or W1 as it is more commonly known, which was written c. 300 years before the period of our reconstruction, and GB-EN MS Adv. 5. 1. 15, better known as the Carver choirbook, and GB-EU 64, better known as the Douglas-Fisher Partbooks, from slightly after it. To this may be added a handful of fragments: S-Uu C233, which contains two liturgical songs inserted into a thirteenth-century codex of texts, and which may be related to Orkney (Beveridge 1939); GB-A 2379/1 two strips of vellum which contain part of a two-voice organum setting of an alleluia from c. 1300, which may be from either London or Aberdeen (Chew 1978); D-W Helmstedt 499, which contains two fragments of fourteenth-century troped alleluia motets, which may be English but which came from a binding associated with Arbroath Abbey (Woods-Preece 2000, 304-24); GB-PA which consists of two slate fragments, found in a drain at Paisley Abbey, with fragments of fifteenth-century notation (Elliot 1996 and Elliot 2000); and GB-EN acc.11218.6.1.H-L (*The Inverness Music Fragments*), which comprise of fifteen mid-sixteenth century paper fragments of liturgical faburden and chant for the liturgy of Holy Week and the office of Compline during lent, possibly from the sangschool at Inverness parish church (Allenson 1989).

What should be clear from the above list is that we have almost no music surviving from Scotland in this period, though it is extremely clear from surviving documentary evidence that there was a thriving musical environment in Scotland throughout this period. Returning to the practical consideration of choosing repertoire for our project, we therefore had to take some creative approaches to produce something both coherent and historically informed. Since Scotland followed the Sarum Rite in its worship (the Latin liturgical rite which developed at Salisbury Cathedral), which was also followed in England, we have a good sense of what music would have been heard for a particular liturgical celebration, as well as surviving copies of chant from the same Rite, found over the border in England.

By selecting Easter Sunday as the core of our reconstruction, a period where we know that James IV was present and celebrated Mass with the chapel royal, we were able to pin a real historical event to

4 For a comprehensive list of all Scottish Liturgical books and fragments from before 1560, see Holmes 2011.

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some surviving versions of music that we know would have been part of it. The knowledge we have of that particular Easter and the days surrounding it are rich.[5] Indeed, details like the fact that the organs (which had been in need of repair), candelabra and the king's cupboard were carried from Edinburgh to Linlithgow, and the 'chapel graith' carried from Stirling, records of food arriving for feasts and celebrations, all come together to paint a vivid picture of what the festivities would have been like that day (Harrison 2016, 77-8).

At the core of these Easter festivities, of course, were the religious celebrations within the Palace chapel, and the core of our repertoire, therefore, is the Sarum chant liturgy for Easter Sunday. This did, nonetheless, cause issues for some of the stated aims of our project, since we wanted to emphasize the richness and cultural significance of Scotland's musical heritage. For all its qualities, monophonic chant is perhaps not the best vehicle for making this point – and indeed it is probably not historically informed to suggest that the King would have had no polyphony on the most important date in the liturgical calendar. We therefore took an approach that was founded on historical practice, and used the quasi-improvisational technique of faburden, as described by the contemporary theorist known as the 'Scottish Anonymous' (author of *The Art of Music Collectit out of All Ancient Doctouris of Music*, from c. 1580 and now carrying the siglum GB-Lbl Add. MS 4911) to 'thicken' some of our monophonic chant into simple polyphony. This approach – which essentially provides a framework for homophonic improvised embellishment in three or four voices – seems analogous to that which would have been taken by contemporary performers, if they had found themselves similarly lacking in appropriate polyphony for a certain event.

Nonetheless, even this lacked a degree of the magnificence that is endowed by composed polyphony. We therefore chose to add a single movement from one of the two earliest Mass cycles found in the Carver choirbook. Both have been recently argued to be Scottish in origin (Cook 2019), rather than continental, as had previously been suggested, and they certainly seem to represent the repertoire available in Scotland towards the end of the fifteenth century. It has been argued that Robert Carver, the scribe of the manuscript, was employed by the chapel royal in Stirling (Woods 1984), precisely the same singers who would have staffed the chapel royal in Linlithgow. It is therefore quite possible that these two Mass cycles would have been performed by the singers we know sang in our reconstructed chapel.[6]

5 To read a more in-depth account of this particular event as well as other insights into Linlithgow Palace's rich past, see Harrison 2016.

6 It should nonetheless be noted that neither Mass cycle is entirely appropriate for the occasion of Easter. We chose the "Sine nomine" cycle, since the other was clearly

The overall effect of our musical choices, therefore, are to pin our performance on a particular event, for which we were able to provide the appropriate liturgical chant – alongside a demonstration of how Scottish polyphony would have sounded in an accurate reconstruction of the kind of acoustic for which it was initially composed.

This project exists in two discrete versions – one an explicitly audio-visual and interactive experience, the other a commercial CD output which makes use of the same reconstructed acoustic. These two different experiences therefore had different priorities and required different approaches, even if working on essentially the same material. It is the VR (i.e. audio-visual) experience on which we will focus predominantly in this essay, beginning with the digital documentation of the site as it currently stands.[7]

3 Digital Documentation

Before the sights and sounds of the past could be reconstructed at Linlithgow, the Digital Documentation and Innovation team at Historic Environment Scotland first documented in 3D the chapel and antechamber at Linlithgow Palace as it stood in 2018 **[fig. 2]**. This baseline dataset would act as the real-world foundation from which the reconstructed visuals and sounds would be virtually built.

intended for St Catherine. The presence of the Kyrie trope "Rex virginum" in the Sine nomine cycle, nonetheless should really preclude its use for Easter – but nothing more appropriate survives.

7 For a more in-depth account of the CD process, see Cook et al. forthcoming.

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Figure 2 An aerial view of the palace as it stands today. The Palace Chapel is located along the middle of the South facade, to the right of the image

Digitally documenting the historic environment of Scotland is a key element in how HES cares for, learns about, and shares the wide variety of assets in their care. For context, the Digital Documentation and Innovation team at HES are in the midst of a project entitled the Rae Project wherein they are endeavouring to document in 3D all 336 of their properties in care and the artefacts which they house.[8] While this is a massive undertaking, this work provides not only a foundation of highly accurate resources to be utilised by heritage professionals and visitors alike, it can aid in education and learning, virtual accessibility, site management, interpretation, conservation decisions, and monitoring changes over time. Digital heritage is an ever-growing tool for the sector to tell more complex stories about the past in innovative ways. This particular project at Linlithgow Palace is an excellent example of how the virtual space can act as a stage on which to layer multiple forms of interpretation and accessibility.

The creation of the 3D model began with a visit to the palace itself, armed with the necessary tools to document the relevant rooms of the site: a terrestrial laser scanner (in this instance a Z+F 5016, which records colour data as well as intensity), and a Nikon D850

8 To learn more about the Rae Project and the work of the Digital Documentation and Innovation teams at HES, see: https://blog.historicenvironment.scot/2020/05/recording-scotlands-history-in-3d-with-the-rae-project/.

camera. Over the course of a day, the team utilised the laser scanner to record with up to millimetre accuracy the existing geometry of the chapel as it stands today, roof missing and stones bare. The scanner works by line of sight, rapidly recording points of a surface in 3D space, assigning each an xyz coordinate up to a million times per second. Each of the points come together in what is called a point cloud, representing the surface geometry of the building in a kind of highly accurate three-dimensional pointillism **[fig. 3]**.

Figure 3 3D point cloud of the Palace Chapel at Linlithgow, Historic Environment Scotland

In addition to scanning the geometry of the chapel, the team supplemented the scans with hundreds of photographs in order to capture fully the photorealistic texture of the space. These images were taken when the light was overcast and even in order pre-emptively to eliminate any harsh shadows in the final model.

Back in the office, using specialist software, the teams at HES registered the individual scans and photography together, forming a large, colourized point cloud. From there, it was processed into a solid model by connecting each of the separate points together to create many polygons on a solid surface, or mesh. The texture from the photography was wrapped onto that highly accurate mesh to create a photorealistic digital representation of the chapel **[fig. 4]**.

Figure 4 A photorealistic 3D model of Linlithgow Palace Chapel, created by combining the accurate geometry of the laser scan, and the colour imagery from the photographs, Historic Environment Scotland

Without further processing, this large dataset is an excellent foundation of spatial information of the structure, but is highly impractical to wield on anything but a specialist machine. In order to make it more accessible to explore, the model was decimated into a lighter model with fewer polygons, borrowing workflows from the gaming industry. Thus, just like in a video game, the new lightweight model is easier to load on personal computers or mobile devices (see figure 4). In order to trick the viewer into thinking they are looking at a much more detailed mesh, we can use different maps, such as normal maps, to create the illusion of detail on a relatively simple model.

From this baseline dataset representing the current chapel in its ruinous state, it was then time virtually to layer on the sights and sounds of Linlithgow in 1512 **[fig. 5]**.

Figure 5 A reduced-resolution version of the present-day palace, rendered in Unity (and haunted by the ghostly figures of our singers)

4 Virtual Reconstruction

The process of digital documentation gave us a platform from which to build our reconstruction. Looking to virtual reconstructions is an increasingly accessible way of exploring historical representations of different aspects of the past. The virtual space allows for the rebuilding of lost heritage and restoration of visual and auditory assets in a reversible and non-invasive way (Pietroni, Fernandi 2021, 4). Indeed, it lends itself perfectly for a viewer to engage immersively with a space digitally across time, a concept explored in archaeological and heritage contexts for years (Morgan 2009). For this project, we decided that the ability to transition seamlessly from the past to the present would be an important part of bridging across time, affording the user the ability to explore how the vestiges of how the building once may have looked could still be traced in its current ruined state.

A typical issue in reconstruction (virtual or otherwise) is what time to represent. Buildings encounter many iterations throughout their history and choosing one version to reconstruct can often be difficult. This project, however, thanks to the rich history available to us, discussed in the second section, was able to set its sights on a specific day. In order to build a reasonable model of how the chapel may have once looked, the research team worked with standing-building archaeologists, historians, and the archival and archaeological record

to attempt to reconstruct the palace c. 1512, on which date James IV is known to have been present, with the singers of the chapel royal, to celebrate Easter, and for the baptism of his son, the future James V.

As is often the case in this type of work, our reconstruction work can be described as having varying degrees of confidence, ranging from relatively certain to intelligent guess work. The evidential basis for all of our decisions will be outlined below as we walk through the user experience step by step.[9]

One of the most readily apparent aspects of our reconstruction, since the user begins the experience directly facing it, is the handling of the two archways which occupy the East wall **[fig. 6]**. According to Historic Environment Scotland's Archaeological Survey of the site (2015, 188), they show no sign of ever having had doors. We have therefore assumed that they function as an ambulatory, essentially extending the liturgical space into a processional route behind the altar. With the size of the space, it is hard to see how it could have functioned for anything other than the smallest of processions, without an inordinate amount of pacing back and forth. Rather than leaving these archways entirely open, given that it is hard to imagine the ambulatory being regularly used, we chose to close them with drapes. For the period on which we have based our reconstruction not all building expenses for Linlithgow survive and there are no explicit mentions of fabric purchased for Linlithgow palace chapel at an appropriate date, but there are, however, notable mentions in the treasurer's accounts of large purchases of material that relate to the King's household more generally. For instance: "Item, for *xij elne taffetj to be ane trevis* to the King; *ilk elne xvj s.; summa… ix lt. xij s*". 11 *elne* of material gives a total of 44 feet, easily sufficient for our purposes. The term *trevis* is often used to describe a dividing curtain in a chapel, though it can also refer to more domestic uses. After the appointment of the Master of Works to the Crown of Scotland in 1529, his accounts give us rather more detailed information.[10]

On the facing wall opposite the altar, the user can see that the wall may have been covered with drapes in much the same way. As with the West wall, there is no surviving evidence of door attachments, though it is unlikely that the chapel ante-room, into which it leads, would have constituted one unbroken space with the chapel. The surviving stone rail at the top of the wall seems to offer the method of attachment for the proposed drapes.

9 For a more detailed account of this, see Cook et al. forthcoming.

10 Edited in Paton 1957, and Imrie, Dunbar 1982.

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Figure 6 The Altar on the Eastern wall in VR, the arches hidden behind tapestry and altar, seen in the 3D model on the right

Figures 7-8 The virtual oak ceiling in VR from the user's point of view; a virtual view of the South wall, with windows and statues in place

Looking up, the user sees a rather impressive oak ceiling **[fig. 7]**. To reconstruct this, we had to unpick two different stages of roof building; the first, most relevant to our reconstruction date, was slightly lower, but we know far more about the construction of the second. In May 1535, there were payments for nineteen 36 foot joists for the chapel (Paton 1957, 123). There are 13 joist sockets still visible, allowing for 6 joists left over for supporting the gallery/loft, completed around this time. The following month, payment was made for birch scaffolding for the ceiling (124). No payment records survive relating to the earlier roof, but its arrangement is obvious from the surviving joist sockets (once the two layers of building work are disambiguated).

We have explicit records for the decoration of the second layer of ceiling construction: John Ross painted the "lyning" of the chapel "syloring" in "fine assur" as well as twelve pendant knobs under the chapel loft (128). Whilst no records survive for the decoration of the first layer of work, we do not take this to be evidence of a lack of decoration. We do, after all, lack the payment records for the construction of this version of the roof in the first place! A similar decoration scheme to that deployed in the rebuilt ceiling has therefore been followed.

More evidence survives of a later reglazing of the windows than its initial disposition. In the mid-1530s, the five windows had 268 ft^2 of clear glass and 29 ft^2 of painted images (128), roughly 60 ft^2 of clear glass in each window with a 6 ft^2 panel of coloured glass. In contrast to the ceiling, there was no practical need to replace the glass in the 1530s – the fundamental architecture of that wall did not change; this must have been an aesthetic choice. We therefore followed a pattern found in the relatively contemporary windows at Stirling Palace and gave clear glazed panels, decorated with the Coat of Arms of James IV on each.

Stirling Palace also served as a model for the decorative scheme we used on the walls, specifically the use of *trompe-l'œil* painted tiles. There are small surviving remnants of plaster on the chapel walls and all walls have therefore been replastered in our reconstruction. No evidence of decoration survives on these remnants and so the decoration scheme is taken from an analogous site. The South wall, which also holds the windows, has a number of niches that clearly once held saintly statues **[fig. 8]**. We have chosen to fill these with saints which make contextual sense: St Andrew, the patron Saint of Scotland; St Michael, the dedicatee of Linlithgow Parish Church, which sits next door to the palace (and also the dedicatee of the chapel Royal in Stirling, Robert Carver's Mass *Dum sacrum mysterium*, and James IV's colossal warship The Great Michael which was built at roughly the same date); St James, James IV's namesake; and St Margaret, that of his wife.

If the user looks down, they will see clay floor tiles. By 1996, some 500 fragments of these had been found in archaeological digs from

across the site.[11] One contains an intertwined 'I' and 'M', and therefore must date from the years immediately following the 1503 marriage of James IV and Margaret Tudor,[12] making them appropriate for the flooring of the chapel, completed shortly thereafter. The masons responsible for the "paythment" of the chapel were paid in February and April 1507 (Paul 1900, 297-8); on James IV's visit to Linlithgow in August of the same year, the masons were paid 42 shillings "in drinksilver" (Paul 1901, 411).

Perhaps the most challenging aspect of the reconstruction was the positioning of choir stalls. The archaeological survey suggested that they would have been placed in the traditional position, along the north and south walls, though there is no surviving physical evidence of this (Linlithgow Palace: Archaeological Survey 2015, 189). However, this positioning blocks much of the light through the windows. Attempting to ameliorate this by positioning these closer to the altar blocks access to the ambulatory and also causes issues with positioning singers around a lectern. No matter where the stalls were placed, they left very little space between them due to the narrowness of the chapel.

We know that the roughly contemporary early chapel at Stirling Castle featured wooden choir stalls with canopies, as these were used as the model for the stalls in Glasgow Cathedral in 1506 (Dunbar 1999, 126). We might therefore have expected that Linlithgow would also have had stalls since the personnel of the Chapel Royal served both. Nonetheless, Linlithgow Palace chapel was significantly smaller than the space at Stirling; even the latter's earlier 15th-century chapel, closest in age to Linlithgow, still measured upwards of 9m x 29m (a footstep of 261m^2, versus only 120m^2 for Linlithgow). It is possible that James was attended by less than a full complement of the Chapel Royal when in Linlithgow: Robert Lindsay of Pitscottie notes that half of the Chapel Royal would travel with the older James III (Mackay 1899,200). Certainly, there is documentary evidence for the transporting of the "chapele geir, organis and eucharist" to Linlithgow (Paul 1902, 347), suggesting a somewhat less permanent installation, at least until the later installation of an in-built organ.[13]

11 For a full account, see Caldwell, Lewis 1997.

12 See Caldwell, Lewis 1997, 837 for an image.

13 Organs were, in the meantime, frequently transported between Stirling, Linlithgow, and Edinburgh. As noted in Paul 1902, 347, David Trail, the Sacristan of the Chapel Royal, organized the transport of the "chapele geir, organis and eucharist of Linlithgow". The permanent Organ was installed in April 1513. A French organ builder, named Gilyem, was paid 10 "licht Franche crounis" for its construction. A detailed description of its method of attachment to the wall of the chapel, and the associated costs, may be found in Paul 1902, 523.

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The problem of situating the choir stalls is exacerbated by the positioning of seating for the Royal couple. After the period of our reconstruction, a wooden loft was added, which sat above the west Wall of the chapel, which has been described as either an organ loft, or a box for the Royal Family. The first of these suggestions is unlikely, since there is insufficient material in the 1513 accounts of the organ's attachment to the wall for the loft to have been constructed – and the organ does not appear to have been relocated later. In either case, it is clear that there was nowhere separate to seat the monarchs at the date of our reconstruction. In the end, we followed the Historic Environment Scotland interpretative reconstruction and set seating for the Royal couple on the North and South wall, making placement of the choir stalls essentially impossible.

5 Acoustic Reconstruction

As well as our visual reconstruction, we sought to reconstruct the acoustics of the chapel. This relied on a detailed understanding of the acoustic properties of the materials we believed were used to construct the building. Materials reflect and absorb sound by different amounts at different frequencies; rough surfaces will also scatter the reflected sound more than smooth surfaces.[14] Having investigated the proposed materiality of all surfaces within our reconstruction, we tagged them with coefficients relating to absorbency over the range of audible frequencies, and a scatter coefficient, so that we were able to model how sounds would have interacted with the reconstructed space.

Once all the surfaces in the model had the required coefficients, we were able to derive an impulse response for the room. This is a measure of all the reflections at all audible frequencies between the sound source and receiver, which can be saved as a.wav file that can be loaded into a convolution reverb plugin, allowing one to apply this room-sound to any sound source. In our reconstruction, a process known as ray-tracing was employed whereby reflections from all the surfaces and objects in the space were simulated to produce this impulse response. Once this was obtained, we were able to imprint the acoustic characteristics of the modelled space on our recorded music.

In order to test the efficacy of this approach, we ran a test that compared an impulse response derived from a Sine sweep in a real building with one in a virtual reconstruction (with both the sound

14 See, for instance, Rindel 2000.

source and the receiver identically positioned),[15] which enabled us to judge how effective our reconstruction process had been, and enabled us to test the efficacy of various plugins for reconstructing acoustics in VR.[16]

5.1 Recording Process

Given the importance of acoustic reconstruction to the process, we chose to record in an anechoic chamber, a space which had close to no natural acoustic **[fig. 9]**. This allowed us to produce a performance as though it were taking place in our reconstructed space, without also overlaying the acoustic of a studio or other venue. However, this does invite various performance problems: the environment is claustrophobic, bears no resemblance to the reconstructed acoustic, and offers very little in the way of feedback to the performer.[17] It is therefore also important to ensure that performance decisions are taken which reflect the intended reconstructed acoustic, rather than the acoustic as is found in the chamber. The difficulty is how to arrive at performance decisions, such as tempo, phrasing, diction, and blend, for an environment which is entirely virtual. We experimented with different approaches, initially recording with headphones that fed back a real-time rendering of the singers with the acoustic overlaid, but we eventually continued with no artificially supplied acoustic. Instead, performance decisions were discussed in advance, short sections were recorded and then listened to within the control room with the overlaid acoustic, and then confirmed. We regularly listened back to the recordings with the overlaid acoustic between takes to ensure that we were still approaching the reconstructed acoustic in a musically appropriate manner. You can hear an example of some of the music recorded in our reconstructed acoustic on Historic Environment Scotland's website.[18]

15 A Sine sweep involves using a tone derived from a Sine wave which moves across all audible frequencies, in this case starting low pitched and ending high pitched.

16 For a full discussion of this experiment and its results, see Selfridge, Cook, Keny McAlpine, Newton 2019. This experimentation took place for another heritage site which was explored during the project: St Cecilia's Hall. A similar process could have been undertaken with the Linlithgow model. However, this was complicated by Linlithgow Palace's status as a tourist site and the fact that it has no roof or windows. This made obtaining sufficiently clean recordings exceptionally difficult. The presence of a colony of bats in the ruin was also problematic for the use of high frequencies within the Sine sweep.

17 For a full investigation of the process of recording and the production of the associated commercial CD recording, see Cook et al. forthcoming.

18 `https://hes-scotland.sharefile.eu/share/view/s713d48dc20af4e-c7aae385e3bdc0e2cf`.

Figure 9 The Binchois Consort with Andrew Kirkman in rehearsal in an Anechoic chamber, York University

6 Interactivity and the User Experience

An important aspect of the development of our VR output, for the impact and engagement follow-on, was that it was designed to be used by visitors on site, within Linlithgow Palace. This necessitated various important changes to both the hardware and software design. The first version of the application ran on an HTC Vive. This wired headset makes use of infrared sensors deployed on two poles for the derivation of positional information. Combining this detailed positional information with the high processing power inherent to wired headsets, it was possible to give an extremely interactive experience. The user could walk freely in real life as a method for navigating the virtual space, mapped to a 1-to-1 scale. Acoustic data could be 'baked-in' at various points with cross-fading as the user moved between them, so that real-time acoustical computation was not required but the acoustics still accurately reflected the spatial characteristics of the exact location of the user.

Nonetheless, the practical realities for having a VR experience onsite cannot be overlooked. The wires of the Vive proved to be a tripping hazard, whilst any occlusion of the sensors – say, for instance, by another visitor walking past – would lead to application-breaking glitches (and extreme nausea on the part of the user). It was also clear that it was not possible for HES staff to be on-hand at all times to watch the expensive laptop and prevent theft, or indeed simply to run the application at source. This model of use also only provided for one user at a time – something which was liable to cause bottlenecks on site. More generally, the combination of phys-

ical movement and the wearing of VR headsets – problematic at the best of times – is especially fraught in a historical building with uneven floors. Though it was attractive to imagine walking around the real space of the chapel, mapped perfectly in the virtual world, and experiencing the reconstruction, this was clearly impossible in reality – other visitors would provide collision hazard and uneven floors would cause tripping (not to mention the potentially fatal glass-less second-floor windows!).

The model was therefore substantially redeveloped with optimization for use as an onsite visitor attraction at the heart. This version was developed instead for the Oculus Quest, a wireless headset which required no positioning poles, and which was substantially cheaper. This removed any danger of occlusion, and allowed for us to supply 5 headsets for simultaneous use. The flip side of this was a huge reduction in processing power, as well as the necessity to run the experience as an 'at seat' application. These two aspects posed questions around the accuracy of the acoustic model, the graphical spectacle (i.e. resolution and rendering), and the degree of interactivity available. Perhaps the most obvious answer to the last of these points is the use of the joystick controllers to control avatar movement on each handset of the Quest. However, given that these are very small and liable to be lost or stolen, we instead sought to use a mode of control which would not require the handsets. The application instead immediately starts (and restarts) when placed upon the head of a user – meaning that no prior knowledge of how to work a VR headset is required. All other functions are selected by using an eye reticule. The user simply looks at an object and, by holding their gaze upon it, can select options. Movement of the player avatar was changed to take place essentially as a 'fly-by-rail' track, where the user is taken automatically around the space. In order to give a degree of agency – and indeed to maintain the ludic aspect which was at the heart of the initial project – the headset tracks the movement of the user's head as they look around, and they can seamlessly transition between the past and present, watching and listening as both the visuals and the acoustics change. Whilst this lost a degree of the desired interactivity, the savings in deployment of processing power allowed us to be far more accurate with our acoustic model. When allowing for unlimited free movement in the space, we had to rely on the Steam VR audio plugin, which was not fully accurate, but did allow calculation of the acoustic as the user moved around the space. Having switched to movement following a set path, we were instead able to make use of Odeon to apply our acoustic, and therefore reach far greater levels of accuracy.[19]

19 For a discussion of the pros and cons of these various plugins, see Selfridge et al. 2019.

The experience was set to be implemented onsite for early 2020, and was thus ultimately postponed in the face of the pandemic. Indeed, as of the writing of this article, the Palace is still closed to the public due to high-level masonry precautions, with the full public release of the VR application delayed until re-opening. With that being said, directly outside the chapel there is currently an interpretation board on the fence that wraps around the palace with a QR code that, when scanned, plays a short version of the experience **[fig. 10]**. According to HES staff, the resulting music playing openly from visitors' phones is rather poignant: the low-level ambient sound playing on personal devices for others nearby to hear is almost as if you are standing in the outer courtyard in 1512, listening to the music drift out of the chapel windows. Though it was never an intended output of the project, it is perhaps significant that currently the only way that a visitor can visit any part of the interior of Linlithgow Palace, is through a version of the VR reconstruction.

Figure 10 A visitor to Linlithgow Palace in 2022, scanning the QR code to experience a condensed version of the project, Historic Environment Scotland

Virtual representations will never fully replace the experience of actually visiting an historic site. It can instead add layers of interpretation and access otherwise difficult to achieve in the physical world. Indeed, until Linlithgow is reopened to the public, this virtual representation is the only way to explore beyond the Palace walls.

7 Final Thoughts

This essay has aimed to outline the context, methodology, and potential of the AHRC-funded research project, *Space, Place, Sound, and Memory: Immersive Experiences of the Past*. Building from a highly accurate digital representation of the site as it stands today, teams across organisations and disciplines were able to reproduce a hypothetical and historically informed musical performance at the Palace chapel for the Easter of 1512.

Digital documentation and the creation of a 3D model should act as a foundation from which to explore facets of our heritage in unique and meaningful ways. As we have discussed above, the *Space, Place, Sound, and Memory* project not only utilises this virtual stage to explore visually the lost realities of experiencing Linlithgow Palace chapel in the 16th-century, but vividly brings it to life through the use of historical music and acoustics. For the teams at HES, this project has showcased how a carefully researched repatriation of historical experience through visual and audio reconstruction opens up new methods of storytelling and meaning-making in the heritage sector at large.

For musicologists, this project can be situated within the context of a number of others seeking to situate historical performance within reconstructed spaces and acoustics, such as Cappella Pratensis' recording of Obrecht's *Missa de Sancto Donatiane*, recorded as a virtual reconstruction within the Church of St James in Bruges,[20] and the *ReviSMartin* virtually reconstructed acoustic of the Abbey of St Martin in Tours, which used an excerpt from Okeghem's Requiem.[21] More broadly, scholars are exploring the importance of soundscapes and acoustic reconstruction to understand performance across a number of disciplines, such as the British-Academy-funded research project *The Soundscapes of the York Mystery Plays*,[22] which takes a similar approach to medieval drama. A refreshing aspect of this project, however, has been the focus on its realisation within the specific context of a heritage environment, with a focus on curation of the site, and user-experience at the heart of its development. The degree to which this allows the musicologist to centre historical sound and music within the visitor experience has been really powerful.

The chapel of the past was not bare-stoned and silent as visitors experience it today, but rich with colour, movement, and sound. The use of cutting-edge digital technology combined with a collaboration of minds throughout the historical, archaeological, musical, and

20 https://sites.williams.edu/obrechtmass/.

21 https://renaissance-transmedia-lab.fr/rtl4/revismartin/.

22 http://soundscapesyorkmysteryplays.com/hearing-the-mystery-plays/.

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digital heritage spheres results in a dynamic interpretation of a moment in our past. This is what digital heritage is capable of: never to replace our built heritage, but to fill in the gaps, virtually bridging the distance between the past and present by reconstructing sight, sound, and exploration.

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Intertwining the Physical and Digital Experience at University Museum
A Case Study from Keio Museum Commons, Japan

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Abstract Keio University, the oldest institute of western higher education in Japan, opened its first university museum, named Keio Museum Commons (KeMCo) in April 2021. To facilitate cultural encounters and interactions among the students, academics, as well as broader public audiences, KeMCo challenges in weaving the physical museum visit and the online digital experience. This paper aims to explore the practices and experiences we have acquired from the development and implementation and further clarify the fundamental principles of how university museums can create digital-physical hybrid experiences across the academic-public sphere.

Keywords Public humanities. Digital cultural heritage. Digital archiving. Audience-centred. Experience design. University museum. New normal.

Summary 1 Introduction. – 1.1 Foundation. – 1.2 Framework. – 2 Digital Platform: Keio Object Hub (KOH). – 1.3 Pilot Research. – 1.4 User Types and Strategic Purposes. – 2.1 Summary. – 3 Physical Platform: KeMCo StudI/O. – 3.1 Input: Promoting Digital Archiving. – 3.2 Output: KeMCoM (Student Members of KeMCo) Project. – 3.3 Summary. – 4 Evaluation. – 4.1 Quantitative. – 4.2 Qualitative. – 5 Discussion. – 6 Conclusion.

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1 Introduction

Keio University, the oldest institute of western higher education in Japan, opened its first university museum named Keio Museum Commons (KeMCo)[1] in April 2021. Throughout its 160-year-plus history, Keio University has accumulated a vast collection of cultural artefacts (objects) from both inside and outside the academic sphere, while the objects were dispersed among different individuals and departments. Thus, KeMCo was designed to serve as a hub to connect these numerous collections of objects, as well as the various educational and research activities that underpin them.

In order to facilitate encounters and interactions between the objects and to create a cultural commons (Hess 2012; Bertacchini et al. 2012) which is accessible to students, academics, as well as broader audiences across the globe, KeMCo challenges in weaving the physical museum visit and the online digital experience through its digital-analogue (physical) fusion project. Although there have been a number of literatures in the area of university museum studies (Boylan 1999; Stanbury 2000; Dransart 2013; Geladaki, Papadimitriou 2014; Simpson 2019) and there is currently a growing literature that came out of the COVID-19 pandemic (Cioppi et al. 2020; Flew, Kirkwood, 2021; Economou et al. 2021), the emerging shift requires more actual responses and reflections which stem from the audiences. This paper reports on a practice-based study, documents the process of developing new approaches in weaving both physical and digital experiences in the new normal era.

1.1 Foundation

The concept of combining the physical and digital experiences within the museum sector has been spreading among scholars. For reference, there are three contrasting examples; one is the CHESS (Cultural Heritage Experiences through Socio-personal interactions and Storytelling) project which conducted an in-depth study into storytelling in museums and provided an interactive participatory experience through building novel mobile systems (Pujol et al. 2012). Another is the meSch (Material EncounterS with digital Cultural Heritage) project, a multi-institutional study that grounded in co-design, enabled cultural heritage professionals to join, use, and create digital interactive technologies alongside the activities held in the physical dimension (Petrelli et al. 2014). And the third is GIFT, a European research project that created "hybrid physical-digital visitor ex-

1 https://kemco.keio.ac.jp/en/.

periences" (Back et al. 2018, 31) through "design exploration of two concepts focusing on gifting and playful appropriation" (31). Moreover, the global pandemic has led the museums to rethink the importance of their digital presence (Debono 2019; UNESCO 2020; Zuanni 2020; Richardson 2021)[2] and further became an impetus for digital transformation for a myriad of museums regardless of their scope, size, or location.

Accordingly, in the museum sector, there have been a number of previous attempts in implementing digital change. And as the field advances, the role of digital is becoming prominent, in various ways. However, this phenomenon does not and should not be construed so as that "the physical space of the museum is no longer dominant" (Art Fund 2021, 5). Rather, the digital and the physical are both dominant and must co-exist. While the pandemic brought "new and emerging audiences" (Noehrer et al. 2021, 7) and there is an evolving need in "audience development" (EU 2017, 11), we should not forget that the audiences live "both in the physical and the digital domain" (32), and as Galani and Kidd state, the concept of "hybrid materialities" (Galani, Kidd 2020, 298) is the key to create and amplify unique value in the context of museums. Furthermore, in the case of the university museums, "they may be a university's main or only space where academic-public engagement take place" (Hide 2013, 10). Unlike other museums, university museums are not "powerhouse displays of masterworks" (Cotter 2009). Instead, their multidisciplinary collections should be wide open in "both within and outside the campus" (Stanbury 2000, 7) and available to both academic and public audiences.

1.2 Framework

We note that audiences are necessarily wide and diverse. Not only in terms of geographical environment or age difference, but they also have different needs, abilities, and interests. Therefore, for interpreting both the digital/physical sphere, this study operates two unique platforms: a) 'Keio Object Hub'[3] – a Japanese and English bilingual digital archiving platform that provides a comprehensive view of Keio's art/culture by linking the dispersed digital collections and other culture-related activities within the university; and b) 'KeMCo StudI/O'[4] – a physical space to learn about the relationship be-

2 See also Onuoha, L.N.; Devine, C.; Martinez, R.; Smallegange, M. (2020). "ICOM Webinar | Digital Transformation for Museums in the Time of COVID-19". https://www.youtube.com/watch?v=WTlXLgopm4s.

3 https://objecthub.keio.ac.jp/en.

4 https://kemco.keio.ac.jp/en/digital/kemco-studio-en/.

tween digital and physical objects through hands-on experience and designing prototypes, in close contact with the museum's exhibition and collection practices.

This research adopts a human (audience)-centred approach (Holtzblatt, Beyer 2016) and describes the design process and outcomes, from the pilot research that took place in 2019-20 until its implementation in April 2021 through March 2022, the opening year of KeMCo.

Following a design- and practice-led approach in which the findings emerge from the outcomes, as well as reflections on the practical activities, the research consisted of the following phases.

- Conception of the Keio Object Hub: outlines the concept of KeMCo's digital platform. Besides, pilot research studies were conducted to understand and define potential audiences.
- Implementation of the Keio Object Hub: illustrates in detail how it is installed.
- Conception of the KeMCo StudI/O: outlines the concept of KeMCo's physical platform.
- Implementation of the KeMCo StudI/O: illustrates in detail how it is installed.
- Evaluation: examines how both digital/physical sphere are explored by the audiences.
- Discussion and Conclusion: describes the insights and findings gained from the study.

The aim of this paper is to explore the practices and experiences we have acquired from the development and implementation of the platforms, and to further prefigure a new generation of university museums, which intertwines the digital and the physical, builds links between the university and the public at large, and is dedicated to both remote and on-site audiences.

2 Digital Platform: Keio Object Hub (KOH)

We note that university collections are necessarily wide and diverse, ranging in many subject areas (Palmer 2004), depending on their respective fields of research and study. Besides, each collection holder has traditionally had different approaches towards, and practices of, digitising and delivering their collections (Robinson 2014). However, as Lee writes, "[t]he dynamic nature of the interaction between the user and the collection was somehow overlooked" (Lee 2005, 68). Even though they focus on a specific domain, when the archival materials go online, opportunities and challenges arise from audiences' behaviour, in many ways, both among and outside of the research communities (Maron et al. 2013). Thus, merely digitisation does not automatically make collections discoverable or accessible (Terras

2015), and more "navigable representations" (Whitelaw 2015) are required – where audiences can search and explore the collections through browsing.

In the following, we describe the process of design and implementation of the KOH and the rationale behind it. While there are standards as well as guidelines for digitising archival materials (Lourdi, Nikolaidou 2009, IFLA 2014, Campagnolo 2020), there is no intrinsic way of visualising them through the web browser (Whitelaw 2015). Of course, under the broad notion of digital humanities, a number of studies have been proposed to deal with the expectations and behaviour of audiences (Pitti 2004; Drucker 2013; Leon 2015; Tom et al. 2017), however, this paper stands unique in providing a comprehensive methodology of how a university museum – a place where wide audiences meet and interact with the university collections – can implement a sustainable digital archiving platform alongside the physical space.

2.1 Pilot Research

Primarily, we needed to find out who our audiences are, and how they would possibly explore our collections. To communicate ideas and facilitate discussions among the major potential audiences, we conducted an online survey and semi-structured interviews with Keio University students across diverse disciplines **[table 1]**. This initial round of research was conducted by the authors with the support of 2 students. We circulated a survey to 3 lectures and conducted on-the-spot interviews, as well as one-on-one follow-up interviews. Due to the limitation of human resources and the pandemic, the participants were relatively small in number,[5] however, we were able to gain insightful feedback from students across different disciplines.

Table 1 Total number of participants

Year	Number of survey answers	Number of interviewees
2019	20	14
2020	112	8

5 By the numbers, Keio University has 10 undergraduate faculties, 14 graduate schools, and approximately 33,400 students. See https://www.keio.ac.jp/en/about/by-the-numbers/.

First, in 2019, one of the questions that we asked was, "What kind of environment and/or exhibition would you like to see and experience at KeMCo?" and the following are the comments as well as answers extracted from this open-ended question:

> I think it would be nice if we could get information about the artworks in both audio and written form from smartphones. (Student who attended the lecture "Museum Information and Media")

> I'd like to see the artworks in an atmosphere that welcomes students and further allows a casual/lively atmosphere, rather than a formal atmosphere (i.e., a perfectly organised 'typical' museum that prevents conversations and requires silence). It would also be nice to have some background music playing. (Student who attended the lecture "Museum Information and Media")

> Students will get bored of just seeing the artworks. It would be great if you could provide us with a more experience-based approach, such as touching, listening to music, and stimulating the five senses. (Junior student majoring in Economics)

Through observing these comments and other survey results, we learned that the younger generation puts more value on physical interaction with the objects as well as with their surrounding environments. And next, in 2020, to gain a deeper understanding of how they see the current state of university museums and further capture their expectations for KeMCo, we conducted another round of surveys with different questions. The following are the extracted questions and answers – (a), (b), and (c).

Answers to the question (a) "What kind of image do you have when you hear the words 'university museum'?":

> Students of that university have seen it [the museum] on campus, but they just pass by. (Senior student majoring in French Literature)

> The museum is for 'education,' so the place is quiet and in a sombre mood. (Sophomore student majoring in Information and Computer Science)

> Used only for academic purposes and are not widely available to the public. (Junior student majoring in Bioinformatics)

> While I think it is valuable to have the opportunity to see research materials owned by a university, it seems that many of the exhibits are quite maniacal (that's just an image), and unless I have a

> great interest in them or they become a popular topic of conversation, I don't think I would go to a university museum – as I only occasionally go to museums to acquire general education and topics. (Senior student majoring in Ethics)

Answers to the question (b) "If your university (Keio University) were to have a university museum, what would you expect to see?":

> I hope that the atmosphere will be such that people can easily go there and become more interested in art, even if they were not very interested in art before. (Senior student majoring in Human Science)

> Exhibitions by students should also be possible. (Senior student majoring in Literature)

> The artworks should be (easily) accessible at home, at the university, or anywhere else. (Junior student majoring in Human Science)

> Events for online participation, cultural festivals, etc. (Senior student majoring in Science and Technology)

> I would like to see the exhibits/artworks owned by or originating from Keio that we don't usually pay attention to, but actually have great cultural value. I would also like to see the museum divided into two sections, one for the permanent collection and one for a special exhibition, so that visitors can visit the museum as often as they like. Furthermore, it would be great to have a guest lecturer/speaker in every six months or so. Of course, it is desirable that the museum is open to everyone, to the wider public. (Senior student majoring in Japanese History)

Answers to the question (c) "KeMCo is currently preparing the following programs/contents. Please tell us what you are interested in" (multiple-choice question) **[fig. 1]**.

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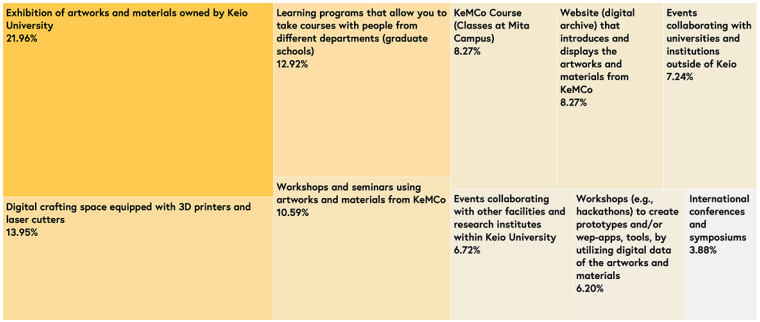

Figure 1 Answer Results to Question (c). Tree Map reflecting the Percentage

The results offered useful insights and shed light on potential audiences' behaviour and expectations. While there was growing awareness towards university museums in Japan (Kinoshita, Yasui 2000), still today, the place is considered to be a 'closed' and confined place. As a matter of fact, when we asked the same students if they have heard the term 'university museum', nearly 80% of respondents (n=112) had never heard of it. However, on the bright side, the students are not fixed on the idea of typical university museums and as shown in the answers to the question (b), we may take their comments into consideration and start from scratch, generate new possibilities in presenting and interacting with the university collections in both physical and digital means.

Additionally, as figure 1 indicates, the majority of students are most interested in the exhibition itself whilst they are also interested in using digital equipment, as well as joining interdisciplinary courses and workshops. From these students' feedback, it is clear that through incorporating digital scholarship into the institutional framework, a university museum can encourage audiences to actively engage with the collections.

1.3 User Types and Strategic Purposes

Based on the insights gained from the pilot research, a series of workshops were conducted in the middle of 2020. To reflect a dual interest from both academic and non-academic, the participants consisted of students, researchers, designers, engineers, as well as office workers **[fig. 2]**.

Figure 2 LEFT: Photos from the workshops / RIGHT: Outputs from the workshops

After testing prototypes, experimenting with the different types of user journeys, we segmented potential audiences in four different types as follows.

- Researchers (lecturers, academic staff, etc.) who utilise literal and visual assets of the KOH, utilise the KOH to access to physical artwork
- Learners (students, alumni, etc.) who utilise mainly visual assets of the KOH, utilise the KOH to explore topic of interests
- Creators (artists, students, etc.) who publish their content on the KOH, contribute to the Keio community
- Visitors (hobbyists, administrative staff, etc.) who simply explore the KOH, get a brief understanding of the KOH

Furthermore, the main user groups were set as Researchers and Learners, and to fulfil their respective expectations and behaviour, the following strategic purposes were identified.

- Functional: the KOH is first and foremost an online archive, and therefore must behave like one. The platform has to include the minimum functions and usage patterns of an online archive and should function well and as expected according to conventions.
- Academic: the KOH's priority is to serve users who use it for academic purposes. For this purpose, it provides objective information about art pieces, collections, events, etc. It should empower them to fulfil their research efficiently and with ease.
- Educational: the KOH plays an educational role for certain users, providing introductory knowledge of arts, inspiring them with suggestions and content that expand their curiosity. For

this purpose, the KOH should be inviting, proactive and supportive.
- Collective: the KOH curates contents and data provided by users ranging from Keio affiliates to art creators. The platform also allows its different user types to interact, creating a sense of community around art and academics.

In consequence, the following three features were implemented to motivate users – especially Researchers and Learners – and assist their active exploration.

Creating a Serendipitous Discovery: on the KOH's top page, thumbnails of Keio's cultural assets will slowly stream across the top, both to exemplify the diversity of the collections and to create chance encounters with different materials. Besides, by using Google Cloud's Vision API,[6] the images of each object are analysed by Artificial intelligence (AI), and the keywords are automatically assigned as 'AI Suggests' **[fig. 3]**. In this way, the KOH creates an opportunity for an unplanned and unpredictable discovery through browsing the vast collections.

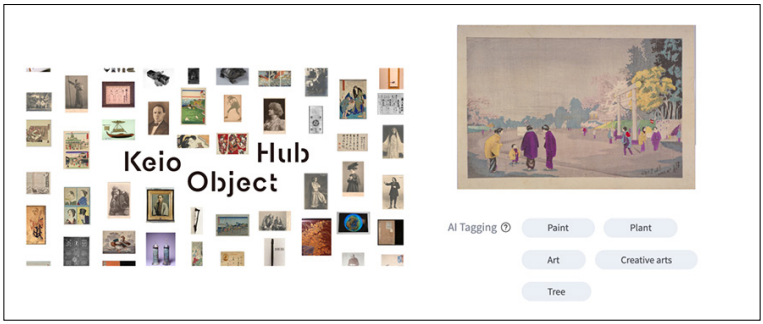

Figure 3 LEFT: Screenshot of the top page / RIGHT: Screenshot of AI Tagging

Enhancing Open Access: to ensure the application of the FAIR (Findable, Accessible, Interoperable and Reusable) principles (Wilkinson et al. 2016), the images are compatible with the International Image Interoperability Framework (IIIF) version 2 and version 3,[7] so that the images, as well as metadata records can be used not only in the KOH but also in other various software. In addition, most of the images are provided under a Creative Commons Attribution 4.0 Inter-

6 https://cloud.google.com/vision/.

7 https://iiif.io/.

national (CC BY 4.0) license,[8] which allows secondary usage. Furthermore, from May 2021, the KOH was linked to the Japan Search,[9] "a national platform for aggregating metadata of digital resources of various fields" (Kobayashi 2022) and enables cross-searching among a wide variety of cultural assets provided by other partner organisations. As of May 2022, there are 83 organisations providing their metadata to the Japan Search and the topics cover "various fields, such as Book/Publication, Official Document, Humanities and Art" (Digital Archive Japan Promotion Committee and Practitioner Review Committee 2020). According to Navarrete and Villaespesa (2020), "cultural consumption must be freed from museum websites" (Navarrete, Villaespesa 2020, 242) and it is crucial for us to advance the use of open data.

Disclosing the Archiving Process: the KOH not only advances the openness of data, but through inquiries into what kinds of experiences can be designed through the utilisation of data, it promotes initiatives regarding the use and application of data. Although the design of the interface does not yet fully meet the W3C standards,[10] our team have compiled a style guide documents guidelines for how experience should be represented in a visual way.[11] Besides, the KOH is designed to extend the physical experience into digital. For instance, the activities as well as outputs created at the KeMCo StudI/O are presented in the section "Behind the Hub" **[fig. 4]** and "Open Data Design" where they reveal the process of archiving activities and the way of using those data.

8 https://creativecommons.org/licenses/by/4.0/deed.en.

9 https://jpsearch.go.jp/.

10 https://www.w3.org/standards/.

11 As of May 2022, the style guide is not publicly accessible, but is available from the corresponding author on reasonable request.

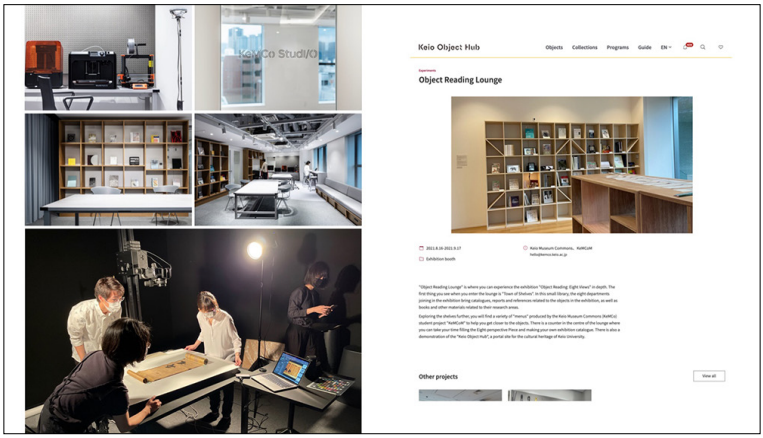

Figure 4 LEFT: Photos from the KeMCo StudI/O/RIGHT: Screenshot of "Behind the Hub"

2.2 Summary

The outbreak of the COVID-19 pandemic forced many museums to share their collections and exhibitions online. However, even before the pandemic, museums had begun to share their collections in a digital sphere in an accessible manner (Wayne 2013). Yet today, a wide range of cultural heritage collections are available in a more transparent and open environment, in which the interpretation of collections is being reformed. For university museums, this movement takes the objects out of the educational environment and provides the opportunity to increase public engagement, unfolds progression of resources and content.

The KOH currently publishes 12,910 items from 19 collections of 6 institutions in the university. The fields of items cover History, Ethnology, Japanese and Chinese Literature, Japanese Arts, Western Arts, Performing Arts and Calligraphy.

In the KOH, each object's metadata and digital image are created, managed, and stored by the institutions separately, using different data management systems. The KOH developed a process to connect each database and regularly aggregate the metadata and digital data. The aggregated data is registered to the KOH's collection management system, called Museum System, where metadata mapping for cross-search, keyword generation for 'AI Suggests,' and image transfer to the IIIF server are processed. The public interface of the KOH is structured up-

on an open-source web content management platform, called Drupal,[12] connected via API with the Museum System.

Through the KOH, a wide range of visitors can engage with objects from the university's collections by accessing rich information such as descriptive texts, digital images including 3D models, related exhibitions, gallery talks, etc.

While the KOH does not have permission to do everything, it was designed to hold a diversity of multimedia content, beyond what would fit in a physical realm, and further enables the audiences to blend in a physical sphere.

3 Physical Platform: KeMCo StudI/O

The KeMCo StudI/O – located in the same building where the exhibition space is – was set up as a creative studio (Fablab) to connect the physical (real) cultural properties with those that exist in digital spaces such as the KOH. The 'I' in StudI/O stands for 'input' and 'O' for 'output,' and it was designed as a place to input and output the tangible and intangible cultural assets that Keio University has accumulated. The 'input' literally means 'to input,' and it promotes the transformation of Keio's cultural assets into digital objects and their introduction into digital spaces, including the World Wide Web. On the other hand, the 'output' refers to the release and sharing of the input data and its utilisation both inside and outside the university.

The studio is equipped with a variety of digital/physical fabrication facilities, allowing museum visitors, students, researchers, and the wider public to come into close contact with the museum's exhibition and collection practices. With its digitisation facilities and creation tools, the studio allows visitors to learn about the relationship between digital and physical objects through hands-on experience and cross-media creation, ranging from speedy prototyping to full-scale content creation. Also, as a symbolic work for the studio and KeMCo as a whole, a commissioned work *FFIGURATI #314* by Enrico Isamu Oyama,[13] an artist and graduate of the Faculty of Environment and Information Studies, has been installed **[fig. 5]**.

12 https://www.drupal.org.

13 https://www.enricoisamuoyama.net/.

Figure 5 Photo of the KeMCo StudI/O with FFIGURATI #314 (the pillar and curtain)

In the following, we describe the concept and activities held at the studio, as well as discuss the outcomes derived from the activities from both the 'input' and 'output' perspectives.

3.1 Input: Promoting Digital Archiving

Part of the KeMCo StudI/O functions as a photography studio for still and moving images of various types of objects, such as manuscripts, art and craft works, and large paintings. Under the supervision of Caloworks Corporation, a company that has been photographing the collection of Keio University Library, the studio performs digital archiving (input) for many departments and institutions at Keio University. We have a variety of equipment, among which two types of mirrorless digital cameras are used for still photography. One can capture high-quality still images with more than 100 million pixels, making it possible to visualise every detail of the target work, and it is also useful for recording and digitally preserving works that will inevitably deteriorate or be damaged over time. Another is an IR (Infrared Rays) camera that is capable of infrared photography. Infrared photography detects underpaintings and text that are difficult to see with the naked eye, and can also check the condition of materials and scratches, making it useful for curators to conduct research. Besides, another area of the KeMCo StudI/O is used for 3D digital ar-

chiving of cultural properties, and currently, two high-precision 3D scanners are being used to create 3D data **[fig. 6]**.

Figure 6 Left: photo of Photography Archiving; right: photo of 3D Archiving

3.2 Output: KeMCoM (Student Members of KeMCo) Project

KeMCoM Project is the name given to the activities of undergraduate and graduate students across disciplines and campuses. Based at the KeMCo StudI/O, the students develop cross-media creative works. They share their interests, knowledge, and experiences, and explore new possibilities in culture/arts and fabrication from their own unique perspectives. Typical examples include the creation of 'kawaii (cute)' content inspired by the visual design of exhibition exhibits and posters (e.g. AR filters on Instagram),[14] the creation of a virtual representation of KeMCo in digital space (e.g. KeMCo 360 VIEW),[15] and the development of aesthetic visuals such as projection mapping. Instead of spending a lot of time and effort to create a one-of-a-kind product, through peer-to-peer learning, they build and show prototypes, reflect on the feedback received, and yet remain open to new ideas. Furthermore, to accelerate the use of 3D data, they are making full use of the 3D printers incorporated into the studio. Through modelling of the data, the output is displayed not only in digital form (= intangible) but also in physical form (= tangible). Of course, the scale, techniques, and materials used are different from the original cultural properties, but the students' hands are moving back and forth between the digital and physical sphere, giving the objects a new perspective **[fig. 7]**.

14 https://www.instagram.com/kemcomembers/.

15 https://studio.kemco.keio.ac.jp/360/.

Figure 7 Left: photo of student members; right: photo of a member showing tangible outputs

3.3 Summary

The years 2020-21 were marked by the expansion of the pandemic, which forced society to undergo a significant transformation. With a greater sense of urgency than ever before, we all realised that building a digital environment and sharing its activities online is not optional, but an essential part of the museums' infrastructure. However, as mentioned previously, museums have long placed a strong emphasis on the physical encounter with objects and spaces that are at the centre of the experience, and accordingly, the digital sphere needs to be connected to the physical. Therefore, as described, KeMCo defines itself strongly as an experimental place that explores the phenomenon of digital/pericycle space by advances in digitalisation and fabrication.

4 Evaluation

The above deliverables from both the KOH and the KeMCo StudI/O, were assessed through quantitative and qualitative approach. As for the quantitative data, the authors summarised the number of users who have accessed and explored the KOH. As for the qualitative data, to gain feedback from the actual audiences, we circulated a survey to the audiences who visited the exhibitions held at KeMCo.[16] Furthermore, during the exhibition opening period, we conducted a series of fabrication workshop for junior school students and circulated an additional survey to those students **[table 2]**.

16 During the exhibitions, the visitors were able to interact with the KOH inside the exhibition room.

Table 2 Dates, Titles, and Numbers from the Opening Year of KeMCo

Exhibition dates	Exhibition title	Number of visitors	Number of survey answers	Number of survey answers from workshop attendees
2021, Apr 19 – Jun 2	Cross-scapes: Interconnecting Art	940	30	12
2021, Aug 16 – Sep 17	Eight Perspectives on Reading Objects	361	147	13
2021, Oct 18 – Dec 3	Tangite me: Reconsidering Conservation during the Pandemic	725	46	18
2022, Jan 11 – Feb 10	Where the Tigers Are	605	208	14

4.1 Quantitative

The examination of the number of accesses to the KOH led to two major findings. First, as figure 8 indicates, a substantial number of users have visited the KOH constantly, without large fluctuations **[fig. 8]**. While it is difficult to compare these numbers with other museums, this becomes a baseline for future improvements. Second, as figure 9 shows, by segmenting the number of unique users (audiences) by country, more than 90% were from Japan, followed by China, United States, Guam, Canada, and so on. Although nine out of ten users are from Japan, it is interesting, as well as insightful, to see the variety and diverseness **[fig. 9]**.

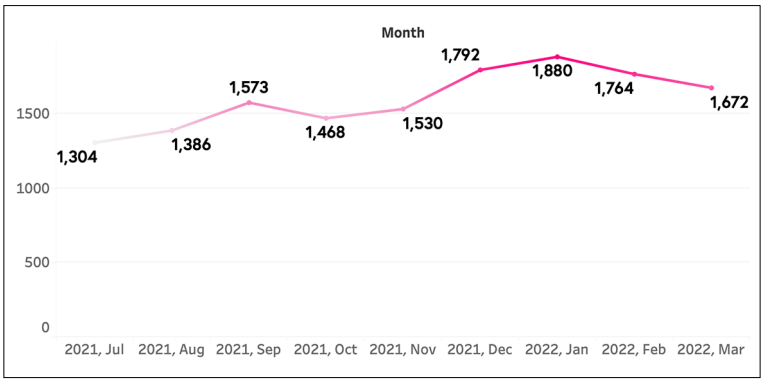

Figure 8 Unique users (audiences) who accessed the KOH (from July, 2021 till March, 2022)

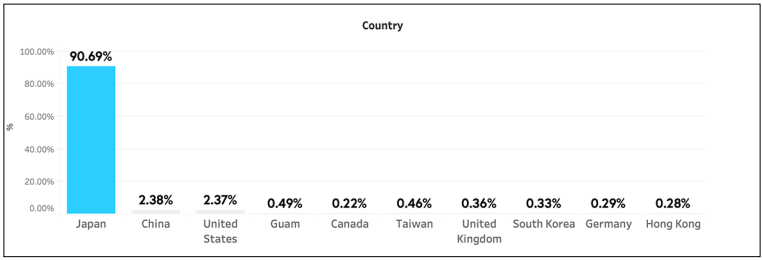

Figure 9 Top 10 by country – percentage average in 9 months (from July, 2021 till March, 2022)

4.2 Qualitative

To gain deeper understanding and behavioural insights of the audiences, we looked into the survey results provided by the visitors and the workshop attendees. The following are the extracted responses from the segmented audiences – Researchers, Learners, Creators, and Visitors.

Researchers' response to the question "How did the KOH stimulate your curiosity in cultural properties?"

> Curiosity was greatly stimulated, as unexpected and interesting material could be found in the objects that appeared by entering the random words, and just looking at the images on the KOH front page seemed to be a good way to broaden interest, as one could find material that one would not normally find. (Researcher at Keio University)

Learners' response to the question "What were your overall impressions of the workshop? Please be as specific as possible and describe what you felt/thought":

> It was a very valuable experience for us to visit the university and see many works of art that we had not seen before. I feel that this was a great opportunity for us to visit the university, as we did not have many chances to visit the university when we were first-year students due to the spread of the infection. We also learned a lot from the explanations and knowledge of the Chemco staff, and I feel that it was a great learning experience. (Junior high school student, workshop attendee)

Creators' response to the question "Please leave your comments and opinions":

> The 9th floor had artworks, including a unique Picasso piece; the 3rd floor had historical artefacts, so I could learn how tools were used in this period; the 8th floor had the latest technology, including a 3D printer, which was fun to experience. There were also works by the calligraphy club, all of which were unique. (Junior high school student)

Visitors' response to the question "Please leave your comments and opinions":

> The clarity and quality of the digital archive images are amazing. It was very interesting to see the different ways of viewing the images. (Unknown visitor)

As presented, it is apparent that the overall conception and implementation were successful in both the digital and the physical realm. However, it is necessary to note that there were different policies and restrictions in the way we generated, collected, and shared both quantitative and qualitative data. Due to its nature, the data obtained and used in this section contain multiple informants and these limitations will influence the findings. This explains the complex survey design. Because of this complexity, it is difficult for us to clearly distinguish among questions and answers related to KOH, the KeMCo StudI/O and the exhibition. Nevertheless, the goal of this study is to intertwine all spheres and not to separately evaluate each, so the affect of the complexity should be to the minimum.

5 Discussion

Both the KOH and the KeMCo StudI/O are emblematic of KeMCo platforms. Its content and functionality bring together resources, collections, and expertise from across Keio University. As more and more digital collections and data are becoming available and accessible, under the wide umbrella of KeMCo, the KOH and the KeMCo StudI/O support and enhance each other's function. As described, the KOH will keep evolving by involving more Keio collections and artworks created at the KeMCo StudI/O. Furthermore, the activities as well as outcomes stimulate KeMCo to reach new audiences through both physical and digital experiences. Accordingly, we summarised and extracted four key common principles as follows:

- Neutral: Both the KOH and the KeMCo StudI/O are for diverse groups of people of all ages who are interested in art, such as people in Keio, people outside of Keio, professional artists, amateur creators, and so on. Thus, the perceptual design should be timeless and less opinionated to be appreciated by anyone.

- Art-centric: Both the KOH and the KeMCo StudI/O host art collections in many different styles. The atmosphere should not disturb the contents but rather make them stand out. The space must respect each Keio collection and treat them without partiality.
- Expert: Both the KOH and the KeMCo StudI/O should communicate the accuracy, objectivity, and trustworthiness of the collections. Thus, the design choice should be durable for both frequent and extensive use.
- Engaging: For both the KOH and the KeMCo StudI/O, the details of the design should catch audiences' attention and encourage them to explore further. Besides, the design should be subtle, and should not disturb the essential experience.

The interdisciplinary opportunities in both the physical and digital sphere will be of value to all audiences, regardless of their baseline differences. Onsite, the KeMCo StudI/O allows access to the real objects, while online, the KOH brings different perspectives to the collections. Besides, it is important to note that the key common principles have developed trusting, solid relationships with both remote and on-site audiences. The studio connects audiences throughout the university, and the KOH encourages audience involvement in not just consuming but also producing and disseminating knowledge. The concept, activities, and the outcomes provide a foundation as both a practical and theoretical framework in intertwining the physical and digital experience.

6 Conclusion

This research contributes to modern scholarship in both digital/physical archiving as well as an audience-centred approach. Our discussion does not claim that there is only one way to support the expectations or needs of all audiences, however, the overall process and results clarify the fundamental principles of how university museums can create new physical/digital hybrid, and act as a 'hub' to facilitate encounters and interactions between the audiences and digital collections. By making our objects accessible to researchers, learners, and the wider public, we gained new perspectives on the objects as well as knowledge and skills, which brings a lot of potential for development and change in university museums, that need to become resilient institutions, fit for the new normal.

Throughout our research, we have developed a deep knowledge of the needs of audiences. The successful outcomes of the KOH and the KeMCo StudI/O are due to a development process centred on audience research and their needs. Whilst our case study covered only

one small university museum in Far East Asia, we are now ever more convinced of "the need to involve everyone in society in the ongoing process of defining and managing cultural heritage" (Council of Europe 2005). Besides, with the availability of growing numbers of collections, we feel the necessity to rethink the nature of museum work. As researchers working in a university museum, we know that just giving access to the objects is not enough. Given the emergency context, we suggest that all university museums expand their conception of physical/digital, and explicitly recognise the significance of blending them together. The physical and digital processes should not be developed as separate parallel tracks or merely co-exist as "copies" (Manovich 2021) of real-life visits. Instead, the physical and digital spheres should be intertwined, deliver the content and experiences that could not be replicated in other contexts.

In the new normal era, university museums must reconsider their role inside the university as well as society, adapt their activity to meet the needs, deepen access and participation for local and global audiences. We note that there is still more work that needs to be done, however, we hope that this study, which illustrated the opportunities and challenges involved in designing a university museum today, will inspire such discussion.

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[Ri]costruire il patrimonio culturale medievale
Il caso delle [ri]costruzioni 3D nella ricerca accademica e nelle GLAMS

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Abstract Digital visualisation technologies including 3D modelling and virtual/augmented reality have revolutionised our critical engagement with the visual arts. The possibility of virtually [re]constructing highly fragmented contexts has opened infinite possibilities and new agendas for research. While the sustainability of Digital Humanities research is at the forefront of current debates, through specific case studies, with a particular focus on medieval historical heritage, this paper aims to critically engage with methodological aspects employed in the creation of digital reconstructions. These models need to balance the need for accuracy and academic certitude with the aesthetic quality of the objects themselves. Through an interdisciplinary and multifaceted approach, it will offer a commentary and a reassessment of the common notion that digital conservation as a discipline needs to offer a curative response in the fields of historical preservation, cultural heritage and archaeology.

Keywords Digital humanities. Middle ages. Virtual reality. Augmented reality. Visual arts. 3D modeling.

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1 Introduzione

Le tecnologie di visualizzazione digitale, tra cui la modellazione 3D e la realtà virtuale/aumentata, hanno rivoluzionato il nostro impegno critico nei confronti delle arti visive (Bonaccini 2011; Cantone 2002; Luigini, Panciroli 2018; Ciula, Eide, 2017; Frischer, Dakouri-Hild 2008; Münster 2022; 2021). Le pratiche di mappatura e modellazione, in particolare, stanno facilitando una più ricca comprensione delle relazioni spaziali tra opere d'arte, edifici e contesti urbani. La possibilità di [ri]costruire virtualmente contesti altamente frammentati non solo solleva nuove domande e punti di indagine, ma rende anche accessibili a un pubblico non specialistico contenuti e problemi molto complessi. Questo ha contribuito a una più profonda consapevolezza storica del patrimonio, e ha innalzato il livello sia della domanda sia dell'offerta culturale. È ormai evidente che si è verificata una democratizzazione della ricerca che deve tener conto di utenti distinti e pubblici diversificati, influenzando le pratiche curatoriali che oggi tendono a un atteggiamento sinestetico ed esperienziale. I vantaggi di un'offerta culturale connessa, inclusiva e apparentemente più dinamica sono evidenti anche nella diffusione e nell'accessibilità dei risultati. Tuttavia, spesso come studiosi siamo posti di fronte all'esigenza di bilanciare il fascino del realismo e il desiderio di un'estetica accattivante con una verità storica e contenutistica frammentata (Cignoni, Scopigno 2008; Bentkowska-Kafel, Denard, Baker, 2012).

A differenza dei manufatti dell'antichità, i resti fisici del Medioevo e della prima età moderna sono spesso accompagnati da un consistente corpus documentario. I metodi digitali di documentazione, ricostruzione e analisi possono quindi essere arricchiti dagli strumenti testuali della filologia e dell'archivistica (Andaloro 2006). L'arte e l'architettura del Medioevo e della prima età moderna, quindi, ben si prestano a un'indagine interdisciplinare di questo tipo. Mentre la sostenibilità della ricerca sulle *'Digital Humanities'* è al centro dei dibattiti correnti, attraverso casi studio specifici, con particolare attenzione al patrimonio storico medievale, il presente articolo si propone di affrontare criticamente gli aspetti metodologici impiegati nella creazione di ricostruzioni digitali e nel processo di anastilosi virtuale. Queste due pratiche devono costantemente bilanciare l'esigenza di accuratezza e certezza accademica con la qualità estetica degli oggetti stessi (Edmond, Morselli 2020). Attraverso un approccio interdisciplinare e sfaccettato, questa indagine offrirà un commento e una rivalutazione dell'idea comune che la conservazione digitale come disciplina debba offrire una risposta curativa nei campi della conservazione storica, del patrimonio culturale e dell'archeologia.

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2 La Carta di Londra, i principi di Siviglia e il CIDOC CRM

La necessità di standard condivisi nella visualizzazione del patrimonio culturale è stata riconosciuta da tempo – i tentativi di standardizzazione risalgono alla Carta di Londra (2006) e ai Principi di Siviglia (2011) (Beacham, Denard Niccolucci 2006; Carillo et al. 2013).[1] La Carta di Londra per la visualizzazione computerizzata del patrimonio culturale è stata concepita nel 2006 come strumento per garantire il rigore metodologico della visualizzazione computerizzata, in qualità di mezzo di ricerca e comunicazione del patrimonio culturale. L'obiettivo è stato quello di conciliare la visualizzazione del patrimonio con le norme professionali della ricerca, in particolare con gli standard di argomentazione e di evidenza. La Carta di Londra è servita da catalizzatore per generare un consenso informato e internazionale sui principi che dovrebbero caratterizzare le visualizzazioni del patrimonio culturale. Oggi non è solo un punto di riferimento ma lo standard *de facto* al quale si rifanno gli organi di ricerca e di gestione del patrimonio. I Principi di Siviglia ampliano i dettami della Carta di Londra affermando che nonostante le [ri]costruzioni e le visualizzazioni normalmente ricostruiscono o ricreano manufatti e ambienti storici come crediamo fossero in passato, dovremmo essere sempre in grado di distinguere ciò che è reale, genuino o autentico da ciò che non lo è. In questo senso, l'autenticità deve essere un concetto operativo permanente in qualsiasi progetto di anastilosi virtuale. In qualche modo il principio di trasparenza intellettuale difeso da Beacham, Denard e Nicolucci si rifà ai dettami di Cesare Brandi che auspicava lo stesso rigore metodologico nella *Teoria del Restauro* (Brandi 1963). La trasparenza insieme ai problemi epistemologici posti dall'iperrealismo sono due questioni fondamentali se si vuole creare nuove opportunità di collaborazione tra progetti. Questo è particolarmente auspicabile specialmente con l'emergere di nuove ontologie di dati come il CIDOC CRM (Bekiari et al 2021). Esso apre nuove opportunità per i progetti di comunicare tra loro, ma solo se sono concepiti e costruiti tenendo conto del loro potenziale dal basso verso l'alto (*bottom up*). Il CIDOC CRM è stato sviluppato in modo da promuovere una comprensione condivisa delle informazioni sul patrimonio culturale, fornendo un quadro semantico comune ed estensibile per l'integrazione delle informazioni sul patrimonio culturale basate sull'evidenza fattuale. In questo modo, può fornire il 'collante

1 Per la definizione dei principi di Siviglia fare riferimento al seguente documento: *The Seville Principles. International Principles of Virtual Archeology. Ratified by the 19th ICOMOS General Assembly in New Delhi*, December 2017: https://icomos.es/wp-content/uploads/2020/06/Seville-Principles-IN-ES-FR.pdf. Per la Carta di Londra (*London Charter*): *London Charter. For Computer based Visualization of Cultural Heritage*. http://www.londoncharter.org/.

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semantico' necessario per mediare tra diverse fonti di informazioni sul patrimonio, come quelle pubblicate da musei, biblioteche e archivi (GLAMs) (Biagetti 2016). Le varie forme di ricostruzione virtuale computerizzata, infatti, offrono la possibilità di svincolare il monumento ricostruito dalla sua realtà documentale e fisica, consentendo di creare ipotesi ricostruttive il più possibile complete ed esaustive, sia dal punto di vista strettamente scientifico che estetico, senza interferire in alcun modo con l'integrità materiale del monumento. Ma la frammentazione, soprattutto nella scelta delle metodologie digitali e dell'architettura dei dati, rischia di impedire o diluire il cambiamento di paradigma promesso dai progetti pilota e dagli strumenti digitali sempre più disponibili.[2] I modelli digitali aiutano a visualizzare complessità finora inavvicinabili con i metodi più convenzionali della storia dell'arte. Le qualità seduttive di questi modelli – che tendono a trascendere quelle delle parole – sono sempre meno mitigate dalla loro natura digitale e quindi potenzialmente aliena.

3 Casi studio

Grazie al rapido sviluppo di strumenti computazionali, alla diffusione di software e hardware e ai cambiamenti nelle priorità istituzionali e di finanziamento, è stata inaugurata una serie di progetti di collaborazione e gruppi di ricerca nel campo delle ricostruzioni di contesti medievali frammentati. Questo processo è stato ulteriormente accelerato dall'emergenza sanitaria e nelle raccomandazioni dell'Unione Europea pubblicate ad Ottobre 2021. Qui si afferma che i membri dell'UE dovrebbero continuare gli sforzi verso la conservazione digitale, specialmente per quel che riguarda il patrimonio a rischio.[3] Tuttavia, già dal 2010 il Programma di Iniziative Congiunte sul Patrimonio Culturale (di seguito JPICH), iniziativa guidata dagli Stati membri che riunisce organizzazioni nazionali di finanziamento della ricerca, ministeri e consigli di ricerca europei per affrontare le sfide sociali nell'ambito dello Spazio europeo della ricerca (ERA), ha lavorato in questo senso. Il progetto *EHEM Enhancement of Heritage Experiences: The Middle Ages. Digital Layered Models of Architecture and Mural Paintings Over Time* (settembre 2020-settembre 2023) rappresenta in modo esemplificativo il lavoro di [ri]costruzione digitale di realtà medievali altamente frammentate. Attraverso

2 Si è tenuto nel giugno 2022 un convegno su queste tematiche, *The Future of the Virtual Past*, presso la University of Cambridge.

3 digibyte | Publication 10 November 2021, Commission proposes a common European data space for cultural heritage, `https://digital-strategy.ec.europa.eu/en/news/commission-proposes-common-european-data-space-culturalheritage` (2022-07-14).

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un consorzio composto da Universitat de Barcelona, Università degli Studi della Tuscia, Università degli Studi Roma Tre e dal CYENS - Centre of Excellence (Cyprus), il progetto prende in esame tre casi studio: Santa Maria Antiqua (Italia), Sant Quirze de Pedret (Spagna) e l'Enkleistra di San Neophytos (Grecia).[4]

Tramite lo studio diacronico di queste tre chiese medievali ci si pone come obiettivo la ricostruzione virtuale delle architetture e degli affreschi, come strumento di ricerca per studiosi, restauratori e curatori al fine di migliorare l'esperienza fruitiva dei visitatori. Le ricostruzioni 3D devono rispondere a diversi obiettivi che vanno dalla comprensione strutturale degli edifici alla risoluzione di problemi cromatici legati ai restauri degli affreschi. Al tempo stesso favoriscono lo studio degli ambienti e dei contesti attraverso l'indagine spaziale del manufatto che mira a una comprensione dell'illuminazione prendendo in considerazione la differenza tra fonti di luce naturali e artificiali, ma anche all'utilizzo dello spazio e dei dipinti in base ai loro fruitori (clero, laici, donne e uomini). Il progetto pone particolare attenzione sullo stato conservativo degli affreschi, e ne registra lo stato di conservazione nelle loro diverse fasi di vita. Uno degli aspetti innovativi della [ri]costruzione e del metodo EHEM è quello di riprodurre digitalmente l'intero ciclo di vita dell'edificio al fine di garantire la conservazione e la mappatura biografica e una conoscenza esaustiva. Quello che si evince da un progetto come EHEM sta nella versatilità che le ricostruzioni virtuali incorporano. Se da un lato sono oggetti volti all'approfondimento di studi e ricerche da parte di specialisti, dall'altro offrono uno strumento per i gestori di questi siti. Inoltre, attraverso l'utilizzo della realtà virtuale si può pensare all'implementazione di finalità legate al *gaming* o alla fruizione del bene *ex situ* tramite applicazioni mobili per smartphone.

Anche il progetto *Time Machine* (marzo 2019-febbraio 2020) attraverso l'utilizzo di fondi comunitari ha contribuito alla digitalizzazione e ricostruzione del patrimonio europeo tra cui quello medievale. Il progetto ha trasformato chilometri di archivi, vaste collezioni di musei, biblioteche e set di dati in un sistema informativo digitale distribuito. Questi *big data* del passato sono risorse comuni per il futuro e tramite la loro digitalizzazione avranno un enorme impatto culturale, economico e sociale **[fig. 1]**.

4 *Enhancement of Heritage Experience: The Middle Ages*. https://www.heritageresearch-hub.eu/project/ehem/.

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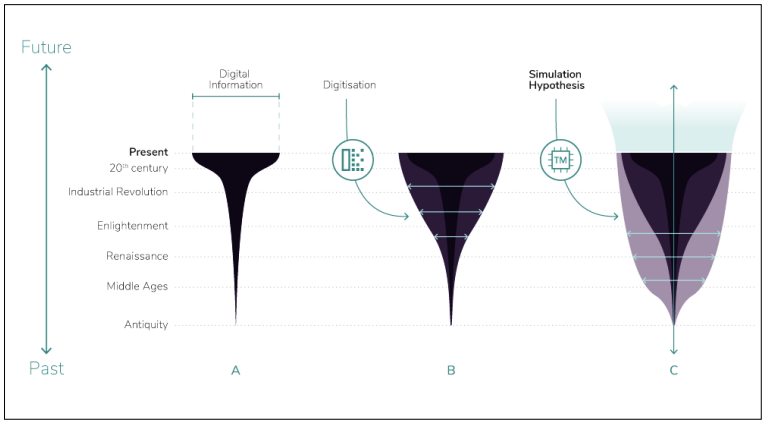

Figura 1 Time Machine: workflow estrazione digitale e gestione dati

Il consorzio coordinato dall'Università di Losanna utilizza la digitalizzazione come primo passo di una lunga serie di processi di estrazione tra cui la segmentazione e la comprensione dei documenti. L'utilizzo di questo corpus digitale è potenziato da applicazioni di realtà aumentata/virtuale (AR/VR), che portano a simulazioni di ipotetiche ricostruzioni spazio-temporali in 4D.[5] Anche se il progetto *Time Machine* non tratta esclusivamente la ricostruzione o digitalizzazione del patrimonio storico medievale, in qualche modo incorpora diverse problematiche esemplificative. Queste vertono sullo studio diacronico del manufatto digitalizzato e sulla diversificazione del suo uso al fine di soddisfare pubblici distinti. Anche se frammentati, le realtà e i contesti medievali sono caratterizzati da molteplici fonti documentarie la cui digitalizzazione ne promuove una comprensione ma soprattutto una consapevolezza da parte di un pubblico sia accademico sia generalista. In questo senso, spingendo le frontiere della ricerca scientifica nelle tecnologie dell'informazione e della comunicazione (ICT) e nelle scienze sociali e umanistiche, un progetto come *Time Machine* avrà un forte impatto sui settori chiave dell'economia europea: software ICT, in particolare applicazioni di realtà aumentata/virtuale, industrie creative e turismo. Inoltre, offrirà nuove prospettive nella pianificazione urbana, nella gestione del territorio e nello sviluppo delle *smart cities*.

5 *Explore the history of Time Machine*. `https://www.timemachine.eu/about-us/`. Il progetto sostiene che questi modelli computazionali sono risorse fondamentali per sviluppare nuove riflessioni critiche sul nostro passato e sul nostro futuro, consentendo nuove intuizioni a storici, scienziati sociali, professionisti delle arti creative, responsabili politici e al pubblico in generale, con un importante denominatore comune: contribuire a un processo decisionale informato, dalla vita quotidiana alle questioni accademiche, professionali e politiche.

Nell'ambito delle *smart cities* ma soprattutto dei contesti urbani possiamo affermare che ci sia stata una vera e propria svolta nell'utilizzo delle tecnologie digitali. I progetti incentrati sullo spazio e sulla mappatura delle ricostruzioni 3D hanno registrato un aumento sorprendente ed esponenziale. Attualmente stiamo vivendo una svolta spaziale (*spatial turn*) riconoscendo sempre di più la nostra relazione con lo spazio e questo indubbiamente sta avendo un effetto a cascata sulla produzione di risultati di ricerca. Più di dieci anni fa il geografo culturale Denis Cosgrove ha parlato dell'insorgenza dello *spatial turn* all'interno dello studio delle scienze umane (Cosgrove 2008; Cooper et al 2022). La geografa Silvia Omenetto ha recentemente condotto uno studio sull'utilizzo del GIS e i sistemi di mappatura all'interno delle scienze umane digitali religiose pubblicando sorprendenti risultati frutto di una ricerca esaustiva (Omenetto 2019). Quello che si evince è che l'utilizzo combinato di GIS e GPS ha dato vita a un ampio spettro di progetti e una grande varietà di applicazioni. *Public Renaissance: Urban Cultures of Public Space between Early Modern Europe and the Present*, ad esempio, è un progetto triennale finanziato da *Humanities in European Research Area* (HERA), che coinvolge ricercatori di università in Italia, Germania, Paesi Bassi, Spagna e Regno Unito (Nevola et al 2022). L'obiettivo è quello di esaminare come gli spazi pubblici, dagli angoli delle strade alle principali piazze cittadine, siano stati plasmati dalle attività quotidiane dei comuni abitanti delle città tra il 1450 e il 1700. Tra queste, *Hidden Florence* (dal 2014) e le cinque app finora create nell'ambito del progetto *Hidden Cities* (2020) sono state pioniere nell'uso di approcci basati sul GPS per una storia pubblica fondata sulla ricerca, per fornire una comprensione basata sulla localizzazione della storia sociale, storica dell'arte e architettonica dell'ambiente costruito delle città premoderne.[6]

L'applicazione geolocalizzata permette di visitare la città di Firenze attraverso sei tour personalizzati in base alla scelta della 'guida' – un personaggio storico attorno a cui è costruito l'itinerario tematico. L'esperienza di *Hidden Florence* ha dato vita a un altro filone di ricerca che si è tradotto nella pubblicazione dell'app *Hidden Florence 3D: San Pier Maggiore* (2019) finanziato dalla Getty Foundation. Il progetto nato nel 2015 ha visto la collaborazione della University of Exeter, della University of Cambridge e della National Gallery di Londra.[7] San Pier Maggiore era una delle chiese più importanti di Firenze, annessa a un prestigioso convento di monache benedettine. La chiesa fu demolita nel Settecento per far posto a un mercato coperto

6 *Hidden Florence 3D – Re-imagining a Lost Icon of Renaissance Florence.* https://calvium.com/projects/hidden-florence-3d/.

7 *About San Pier Maggiore.* https://hiddenflorence.org/hf-3d/about/.

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e oggi ne rimane solo l'omonima via. Le sue opere d'arte sono disperse in collezioni di tutto il mondo, tra cui la pala di Jacopo di Cione dipinta per l'altare maggiore della chiesa nel 1371, oggi conservata alla National Gallery (Cooper et al. 2022; Cooper 2018). Sfruttando il riallestimento del 2018 dell'ala Sainsbury della National Gallery, l'applicazione mostra la pala d'altare maggiore della chiesa nel suo spazio ecclesiastico e architettonico originale, consentendo agli utenti londinesi di visualizzare il contesto storico fiorentino dell'opera intorno al dipinto nello spazio della galleria. Al contrario, a Firenze, l'utente è in grado di visualizzare la pala d'altare, ora conservata alla National Gallery, nel luogo in cui era stata creata, comprendendo sia l'interno della chiesa rinascimentale sia la sua successiva trasformazione in un quartiere residenziale moderno. Il progetto è una collaborazione di ampio respiro, tra istituzioni accademiche e una galleria e in parte finanziata con fondi pubblici ed entità commerciali come *Calvium* e *Zubr*. Per questo progetto si è scelto di pubblicare il codice in open source su GitHUB, da cui si evince che la parte più complessa è stata proprio quella di far convergere la geolocalizzazione con la ricostruzione in realtà aumentata. Si punta a ricostruire la chiesa sia a Firenze che dentro alla National Gallery ma virtualmente ovunque lo si desideri. Il progetto pone l'accento su un altro degli aspetti fondamentali delle ricostruzioni, ovvero l'utilizzo di piattaforme open source. Questo aspetto risulta essere fondamentale se si vuole aderire al principio di trasparenza e garantire la sostenibilità dei progetti anche allo scadere dei finanziamenti.

Progetti come *Hidden Florence 3D: San Pier Maggiore* trattano una delle tematiche più controverse nella medievistica. Spesso i manufatti medievali sono altamente frammentati o ricostruiti. In particolar modo quando si prendono in esame contesti ecclesiastici, spesso gli arredi, le pitture e le sculture non sopravvivono più nel loro contesto originale. Già nel 2006 in *La pittura medievale a Roma 312-1431 Corpus e Atlante*, Maria Andaloro, con la sua *équipe* di ricercatori dall'Università della Tuscia, offrì la prima ricontestualizzazione dei dipinti murali e dei mosaici delle chiese medievali di Roma attraverso dei 3D in forma cartacea. Con l'ausilio di planimetrie e viste assonometriche, l'obiettivo fu quello di mostrare le decorazioni medievali originali, che oggi sopravvivono prevalentemente in stato frammentario o che sono state strappate e conservate in contesti museali. Il progetto di ricerca condotto presso l'Università degli Studi Roma Tre si inserisce in questo filone di ricerca.[8] L'insediamento delle comunità femminili in strutture preesistenti, la perdita di un numero significativo di conventi e la deperibilità dei materiali da costruzione uti-

8 Il progetto triennale *VR Sant'Agnese vita monastica a Roma*, svolto sotto la supervisione di Maria Chiara Giorda e Giulia Bordi presso l'Università degli Studi di Roma Tre.

lizzati hanno troppo spesso compromesso lo studio dell'architettura monastica femminile (Bruzelius 1996). Per questi motivi, quando si tratta di religiose, non è possibile rintracciare schemi architettonici fissi sulla base degli elementi superstiti. Il progetto *VR Sant'Agnese* combina strumenti consolidati di indagine scientifica, tra cui, ma non solo, la ricerca d'archivio, l'esposizione empirica di oggetti esistenti e lo studio meticoloso delle strutture edilizie con la fotogrammetria/nuvola di punti, la modellazione CAD e infine la realtà virtuale. Questo progetto mira a ricostruire la veste medievale del monastero di Sant'Agnese fuori le mura a Roma, in uno studio integrato di architettura, arredo liturgico e pittura. Vuole produrre un'analisi spaziale precisa che superi il limite descrittivo delle riproduzioni fotografiche. Creando un modello virtuale in 3D del monastero nel suo aspetto tardo-medievale, questa applicazione vuole essere sia uno strumento di ricerca che uno strumento interattivo per visitare il monumento. Lo spostamento verso la comprensione del contesto, dell'esperienza e della ricezione di manufatti ed edifici nella ricerca storica dell'arte pone un'enfasi sempre maggiore sul recupero dello stato 'originale', 'previsto' di un monumento, così come delle sue successive trasformazioni e spostamenti di significato.

Il complesso monumentale di Sant'Agnese fuori le mura sorge su una piccola altura della via Nomentana, alla periferia del centro di Roma (Claussen 2002, 64-5; Giesser 2017, 108-13; Romano 2017b, 303-7). Originariamente sede di un cimitero paleocristiano e della sepoltura della stessa Sant'Agnese, l'area conobbe un periodo di ampio sviluppo, promosso sia da Costantino che da sua figlia Costanza, durante la transizione dell'Impero Romano dal paganesimo al cristianesimo. Nel 1112, Pasquale II (1099-1118) insediò un gruppo di monache benedettine che occuparono il complesso per oltre tre secoli e mezzo fino a quando, nel 1480, furono sostituite da una comunità di monaci. Lo stato e l'aspetto attuali della chiesa sono dovuti ai lavori di restauro effettuati nel XIX secolo da Papa Pio IX, verso il 1855-56. Diversi autori raccontano con dovizia di particolari l'aspetto della chiesa tardo-medievale nel corso del XVI secolo. Queste cronache sono state particolarmente utili per ripercorrere l'aspetto della chiesa e soprattutto del suo recinto corale tra il 1200 e il 1400. Due cicli di affreschi, originariamente raffiguranti scene della vita di Santa Caterina e di San Benedetto, si trovavano nelle gallerie superiori della Basilica e furono staccati in 22 riquadri nel 1856 durante i lavori di restauro effettuati da Papa Pio IX (1846-78). Il ciclo di Santa Caterina si trovava nella galleria settentrionale che si estende nell'area sopra il nartece, mentre le storie di San Benedetto sul lato meridionale del matroneo. Attualmente sono conservati nei depositi della Pinacoteca Vaticana e non sono visibili al pubblico. Studiando le cronache cinquecentesche della basilica, misurando i frammenti medievali superstiti della schola cantorum originale e combinando-

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li con le informazioni fornite dalle iscrizioni del XIII secolo, abbiamo iniziato a tracciare l'impianto medievale di Sant'Agnese durante gli anni 1250. La linea di sviluppo del progetto è stata definita da Marco Canciani, direttore del Laboratorio Riltec presso il Dipartimento di Architettura dell'Università degli Studi di Roma Tre. Le informazioni storico-documentarie sono state integrate con i rilievi planimetrici del complesso condotti da Emanuele Gambuti, che ha scansionato il convento e delineato le piante architettoniche del monastero per la sua tesi di dottorato presso il Dipartimento di Storia, Rappresentazione e Restauro dell'Architettura dell'Università La Sapienza di Roma. La pipeline tecnologica prevedeva come primo passo la creazione di un'ortofoto sovrapposta alle planimetrie insieme alla classificazione catastale redatta dal Comune (ca. 2010). Prima della campagna laser, all'interno della Basilica abbiamo effettuato una serie di misurazioni del complesso monastico per verificare l'accuratezza delle planimetrie del Gambuti. Nel dicembre 2019 il rilievo laser è stato effettuato dal professor Marco Canciani e da Giuseppe Fioravanti con lo strumento Faro Focus sia all'interno della chiesa, sia nello scalone monumentale, sia davanti alla facciata. La nuvola di punti è stata pulita e il suo allineamento ottimizzato con il programma ReCap. Parallelamente abbiamo semplificato i DWG del dottor Gambuti in AutoCAD per ottenere un *rendering* che fosse il più vicino possibile all'aspetto originale della chiesa medievale. Abbiamo utilizzato una pianta cinquecentesca del complesso (ca. 1550) disegnata da Alberto Alberti (1525-1598) come mappa visiva per i disegni CAD, che sono stati naturalmente integrati con gli studi sull'arredo liturgico condotti da Peter Cornelius Claussen nel *Corpus Cosmatorum* e con le fonti documentarie primarie sopra citate.

Figura 2 Sant'Agnese fuori le mura, modello 3D

A Sant'Agnese sono state prese misure precise dei frammenti scultorei superstiti per delimitare la lunghezza e la larghezza del recinto del coro. Si è quindi proceduto a misurare i pulpiti Cosmati che condividevano una cronologia simile a quella presente a Sant'Agnese fuori le mura. Lo stesso è stato eseguito a San Clemente, San Lorenzo fuori le mura e Santa Maria in Cosmedin per creare prototipi di modelli per la ricostruzione virtuale della *schola cantorum* di Sant'Agnese. Si è quindi proceduto alla modellazione 3D in vivo, prendendo come punto di riferimento la nuvola di punti. Le piante e i prospetti sono stati modellati in 3D con *Sketchup* e *Rhino* e, una volta terminata la modellazione, abbiamo lavorato con Vray e Photoshop per le luci e i ritocchi finali nel *rendering* **[figg. 2-3]**. Tutte le misure del modello sono esatte e tengono conto sia dei frammenti scultorei presenti nel convento, sia della nuvola di punti, del DWG di Gambuti e della mappa di Alberti. Per quanto riguarda la pavimentazione a mosaico abbiamo disegnato quella presente nel modello utilizzando come riferimento il mosaico di San Clemente.

Figura 3 Sant'Agnese fuori le mura modello 3D

Sant'Agnese fuori le mura in realtà virtuale mira a diventare nel tempo un modello che possa essere sia utilizzato come strumento di ausilio alla visita del monumento, sia un'applicazione di ricerca per continuare a testare e verificare possibili ipotesi. Un altro progetto che ben evidenzia gli usi di modelli virtuali di chiese medievali è quello condotto per la Basilica di San Paolo fuori le mura da Nicola Camerlenghi.[9] La Basilica Virtuale di San Paolo a Roma è un progetto interattivo di realtà virtuale che offre un'esperienza esplorativa, educativa e coinvolgente di uno degli edifici storicamente e spiritualmente più influenti del mondo. San Paolo è stata l'ultima basilica imperiale costruita a Roma, la seconda chiesa più grande della città e l'epicentro del culto del suo omonimo fino a quando un fatidico incendio la ridusse in macerie nel 1823 (Camerlenghi 2013; 2018). Oggi, la basilica ricostruita sul sito rispecchia solo vagamente l'originale, ma è un monumento del patrimonio mondiale dell'UNESCO.

Nel corso di 10 anni, Camerlenghi ha ricreato digitalmente la basilica originale nei momenti salienti della sua storia millenaria. Questo lavoro è culminato in un libro e in un sito web. Con il sostegno

9 *St Paul's Outside the Walls: A Virtual Basilica*. https://rcweb.dartmouth.edu/CamerlenghiN/VirtualBasilica/.

di una borsa di studio NEH-Mellon, l'obiettivo è quello di pubblicare un modello VR commentato per studenti, studiosi e tutti coloro che sono interessati alla storia di Roma e del cristianesimo. Inoltre, questo progetto rappresenta un'opportunità per constatare il valore della VR come strumento umanistico di ampia portata.

4 Conclusioni

Quando si parla di [ri]costruzioni viene frequentemente citato il celebre saggio sull'aura del 1937 di Walter Benjamin (1935). Tuttavia, i contesti medievali spesso sopravvivono nella loro natura frammentata ed esulano completamente dalle problematiche legate ai *digital twins* o ai cloni. Non possiamo quindi parlare di simulacro digitale anche se permane la questione del *hic et nunc* nel singolare intreccio di spazio e tempo. Detto questo, le ricostruzioni 3D di contesti medievali spesso rappresentano la trasformazione dello spazio nel tempo ovviando e sfidando la definizione di aura descritta da Benjamin *tout court*. È registrando il passaggio del tempo che questi modelli acquistano il loro significato, trasformandoli in strumenti utili per i ricercatori e per il pubblico in generale.

La ricerca assistita dalle tecnologie informatiche ha cambiato radicalmente il modo di comunicare la storia dell'arte e dell'architettura. È ormai evidente come l'uso delle tecnologie abbia rivoluzionato il nostro impegno critico nei confronti delle arti visive. Come possono i modelli digitali rivelare sia i fatti che l'incertezza? Il campo in espansione della storia dell'arte digitale giocherà un ruolo chiave nella realizzazione di queste tendenze, non solo nella presentazione o visualizzazione dei dati, ma idealmente come strumento per generare nuovi risultati di ricerca che trascendono i limiti della produzione scientifica tradizionale (Di Mascio 2021; Jannidis 2013). Sebbene il materiale presentato in questo articolo sia molto diversificato, esso testimonia un approccio metodologico che combina la ricerca architettonica, archivistica e storica dell'arte integrata con strumenti tecnici che aiutano la visualizzazione dei risultati della ricerca. Tuttavia, incorporare questi strumenti nella ricerca accademica convenzionale comporta delle sfide. Quali strategie si possono utilizzare per valutare la qualità e l'affidabilità dei modelli digitali?[10] Come possiamo certificare uno standard che bilanci le diverse esigenze dei pubblici garantendo qualità estetica ma anche accuratezza? È attraverso una solida ricerca di fonti primarie e un'integrazione trasparente

10 Rispetto a questo argomento nel dicembre 2020 si è tenuto presso la Bibliotheca Hertziana di Roma il workshop *Visualizing Complexities: Practices and Heuristics of Digital Models in Art History.*

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della tecnologia che questo può essere garantito. Sebbene il processo di *peer review* in atto in molte riviste accademiche sia stato pesantemente criticato, esso ne potrebbe certificare la loro accuratezza favorendone una maggiore durata. La modellazione 3d deve essere in grado di articolare ipotesi, incertezze e congetture attraverso un sistema di citazioni interne al modello stesso. Oltre a certificare il valore scientifico dovremmo immaginare nuove forme di pubblicazione che possano garantire l'aggiornamento del modello sia a livello contenutistico che di software. Non è da sottovalutare l'impiego delle ricostruzioni a livello pedagogico, poiché ci auspichiamo che questi modelli possano essere organismi permeabili intesi non solo come prodotti ma soprattutto come strumenti di ricerca.

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Modern Art from the Arab Region – Digitisation as a Chance? The Research and Database Project LAWHA as a Case Study

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Abstract Reconstructing history is a challenging task. What does it mean exactly and how to proceed? What are the advantages of the digital approach to history? How can we differentiate between digital art history and art history with digitised material? The present paper aims to provide insights into the ongoing research project LAWHA (*Lebanon's Art World at Home and Abroad: Trajectories of Artists and Artworks In/from Lebanon Since 1943*) and the knowledge structure of its database. How does the data need to be modelled to provide answers to the guiding research questions? The project departs from the presumption that the digital can create more visibility for modern art from the Arab region and ultimately broaden the art canon. Is that too positivist an approach and can the digital really be the spearhead of real-life developments? What role do keywords play in that regard?

Keywords Controlled vocabularies. Digital art history. Modern art. Lebanon. Database. Ontology. Semantic web. Knowledge organisation.

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1 Introduction

Database projects and open data are the order of the day. Numerous initiatives around the world are working on securing cultural heritage and making it accessible to the public.[1] This is important insofar as they may – in the future – allow for a greater depth of understanding, or reveal hidden facets, or alternative representations of history, in this case art history. In the course of massive digitisation efforts over the last two decades, a significant change has taken place in that collection holdings have now become more transparent and can be accessed remotely, even if not always openly so (e.g. due to copyright restrictions). This makes scholarly work much easier, at least when it comes to obtaining a first impression of the material. However, the digital should not, and cannot, replace the original. The added value lies rather in their complementary aspect.

In Lebanon, and the Arab region more broadly, publicly accessible archives are rare, and documents are often scattered throughout various institutions and difficult to obtain. Therefore, such initiatives make an important contribution to protecting cultural heritage from being forgotten or even destroyed. The impending loss of information on artworks, artistic practices, and artists from the pre-digital era is becoming ever clearer, making it all the more urgent to collect and process the historical evidence that is still available. In Lebanon, for example, numerous archives and sometimes artistic works have been lost or destroyed over the last fifty years as a result of armed conflicts, catastrophes (such as the Beirut port explosion in August 2020), or carelessness (a few legacies have simply ended up being thrown away). These irreparable losses lead to numerous gaps in the reappraisal of Lebanon's history of art and the reconstruction of its networks. Against this backdrop, initiatives that strive to track down and secure the remaining material seem all the more imperative. Digitising and storing surrogates of artworks and archival material in digital repositories ensures greater security and accessibility. Nevertheless, it can only encapsulate the information, not its materiality.

LAWHA – *Lebanon's Art World at Home and Abroad: Trajectories of Artists and Artworks in/from Lebanon since 1943*[2] is not an archival project in the sense that it provides a physical space for documents. Rather, LAWHA is a research project and database that will

1 Open access is often a goal of the initiatives but cannot always be achieved due to legal and ethical restrictions.

2 This project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No. 850760) and is hosted by the Orient-Institut Beirut/Max Weber Foundation. For further information see: `https://lawha.hypotheses.org`. The Author of this article works as a researcher in the project.

host a digital collection. Although the terms 'archive' and 'digital collection' are often used interchangeably, there are fundamental ontological differences between them. As Diego Mantoan points out, one important characteristic of an archive in the traditional sense is that it forms a closed circuit (2021, 160). Knowledge is established around one person or one institution. Despite being open for potential additions, it will always be centred on one collection and never strive to connect to anything outside itself. The archive's main purpose is therefore to collect, categorise, and preserve information without any curatorial intervention using the "principles of provenance, original order, and collective control"[3] (Theimer 2012). Archives and databases have become interchangeable conceptual entities that are considered a "selected, ordered searchable grouping of materials that are made accessible for research purposes" (Mantoan 2021, 160). A database, however, is generally subject to specific research agendas and the information tailored to serve this purpose. One of its aims is to connect sources often stored in different collections and to enhance them by juxtaposing secondary sources for contextualisation purposes.

> It can be a varied ensemble of collections and physically dispersed items gathered together solely in the digital realm. (Mantoan 2021, 160)

Kate Theimer (2012) therefore suggests that online collections be referred to as digital collections rather than archives. It is evident that digital repositories which combine primary and secondary sources with thematic cross references have their advantages. However, these digital collections often pay little attention to original contexts such as the position and proximity of documents to other physical objects within the collection, something which is preserved in most archival practices.[4] The original context is often dissolved to fit into new contexts that help underpin specific research questions. The "contextual mass" (Mantoan 2021, 161) or the possibility of combining different items (e.g. digital reproductions of artworks, publica-

3 The American Society's full definition of an archive is as follows: "Materials created or received by a person, family, or organization, public or private, in the conduct of their affairs and preserved because of the enduring value contained in the information they contain or as evidence of the functions and responsibilities of their creator, especially those materials maintained using the principles of provenance, original order, and collective control" (Theimer 2012).

4 "Most digitisation projects frequently turned into a sort of 'augmented collection', intermixing materials of different origins, whereby digitised primary sources often lost track of their physical context and its related meaning, such as their position or arrangement in boxes, folders, parent collections or donations" (Mantoan 2021, 161).

tions, correspondence, diary entries), subjects, and ideas with each other when retrieving information is important to LAWHA, as the project aspires to make connections and add facets to the larger picture. It also aims at providing information on the original context of each archival document in the metadata (e.g. part of which collection, part of which folder). However, given the limited duration of the project (2020-25) and the priorities it needs to define, the aim is not to replicate the original archival collection. LAWHA's database will not only provide digital surrogates of selected artworks and archival documents (i.e. price lists, correspondence, invitation cards, notes, photographs, diaries) but also comprehensive information on actors, organisations, publications, exhibitions, and artworks including audio and video interviews. The Omeka S open-source software supports the project's ambitions to organise and connect digital cultural heritage collections with other resources online. The project's database and digital platform (DDP) is intended as a tool to facilitate linking context and artistic creation, as well as serving as a model that can be used by similar projects in the future. LAWHA aims to make knowledge accessible by gathering and locating resources, tracing patterns and networks, as well as by making data visible. At the same time, it seeks to generate new questions and insights.

This is where digital art history comes into play. Digital art history can be described as the process of creating knowledge using new methods. It does not aim to replicate existing knowledge, but rather to generate new knowledge with the help of digital tools. This data-driven art history implies the visualisation of data, i.e. in knowledge graphs. In doing so, new knowledge can be generated which would have been difficult to access with analog methods. Knowledge graphs are semantic networks that represent objects, events, people, concepts, etc. They visualise the relationships between these entities and can be helpful tools, especially when dealing with large datasets. Nonetheless, it can only be a tool and not a means in itself. Data without any further processing, i.e. contextualisation and interpretation, is useless data. Eef Masson points out that the aim of creating meaning with data is, however, not necessarily a commonly shared one:

> Other critics react instead to the claim that digital scholars do not actually *need* to do this: that it is enough that they discover patterns […] as these already 'show us what we would never have been aware of' without our digital tools. (Masson 2017, 32; emphasis in the original)

The visualisation of relationships is certainly an important advantage of digital tools as they allow us a bird's-eye view on certain aspects of the world, which makes patterns more easily discernable than was previously possible with analog methods. It also allows us

to visualise the centrality of persons (e.g. artists, gallerists, art critics) within a group for example, or the importance of certain institutions, artworks, or periods. However, importance or centrality is the sole result of quantifiable data, it does not provide us with any information on the quality of relationships. In addition, network graphs, although they do not contain a narrative as such, have the "potential of 'possessing narrativity'" (Venturini et al. 2017, 157). Narrative meaning can be derived from "visual properties such as topology, density of connections, absence of connections, size, position and colour nodes" (Venturini et al. 2017, 167). The authors convincingly argue that not only do computational and formal analytical possibilities need to be developed, but also narrative ones for networks to become more powerful knowledge instruments (168).

There is another important point, however, that may cause some reluctance vis-à-vis the graphical representation of knowledge. Eef Masson referring to Johanna Drucker points out that

> rendering information in graphical form […] 'gives it a legibility that hides every aspect of the original interpretative framework on which the […] data were constructed'. […] Therefore, we are well advised to think of them not as *data* (given) but rather as *capta* (taken), 'constructed as an interpretation of the phenomenal world' rather than inherent to it. (Masson 2017, 32; emphasis in the original)

The lack of depth in most visual representations gives the impression of clear data that has not been subject to doubt or interpretation. Therefore, digital research requires reflection on the status of one's data, the methods and tools, and the interpretations. (Masson 2017, 33) This should be made as transparent as possible. These preliminary thoughts are essential for LAWHA and for any digital (art) history project as they acknowledge the potential of digital tools, and at the same time highlight the importance of constantly connecting any digital representation to its original context and of questioning its validity.

In the following paragraph, the project will be outlined and contextualised within the research on modern art outside of Europe and North America.

2 Revisiting the Canon of Modern Art

For non-European modern art – here in particular from Lebanon and the Arab region – there is an imbalance in representation both in the analog and the digital area. Art historical knowledge about this region is mostly limited to Islamic art. In recent years, however, re-

search has increasingly been extended to include modern art.[5] This gap is partly due to an attitude prevalent for a long time which has generally considered modern art from non-European contexts as "belated" or "missing". From this perspective, artworks have been reduced to mere copies of European or Western originals and have thus not been worth considering. This superficial and singular view of other modernist expressions has begun to change over the past years, however. More and more initiatives are attempting to decentre arts and culture, and knowledge more broadly. This manifests itself in a remodelling of university curricula as well as curatorial and scholarly practices. It implies a comprehensive, much overdue revision of institutionalised and deeply rooted perspectives on non-Western art that need to be deconstructed and recontextualised in favour of a more inclusive artistic canon and art history (Bellan, Drost 2021, 17).

On the other hand, art historical evidence has, not least due to a lack of capacity and infrastructure (and possibly also a deficiency of self-esteem with regard to their own modern artistic heritage) in the region itself, so far not been systematically processed or recorded. Scholarly writings on modern Arab art which endeavour to reconstruct local art histories have therefore only recently gained momentum. In parallel, several initiatives[6] have emerged whose aim it is to secure and preserve archival material and make knowledge (digitally and sometimes also analogously) accessible. All these efforts have helped to raise awareness about the rich artistic heritage that needs to be preserved and processed. They may in the future provide answers to many art historical questions and reveal connections that have fallen into oblivion. The potential for expanding the art canon in the future is laid out in the archives. Not only can local and regional canons be expanded, but connections and exchange relationships between artists, institutions, art critics, and ideas can be displayed on a global level.

This concept is a core concern of the LAWHA research project. The project examines the trajectories of visual artists and artworks in and from Lebanon since the country's independence from France in 1943, and in doing so revisits prevalent narratives and sheds light on hith-

5 See for example: ARVIMM – Groupe de recherches sur les Arts Visuels du Maghreb et du Moyen-Orient, 19e-21e siècle (https://arvimm.hypotheses.org); Institut des Cultures d'Islam (https://www.institut-cultures-islam.org); Institut du Monde Arabe (https://www.imarabe.org/fr); Mathqaf (https://mathqaf.com); Mathaf (https://mathaf.org.qa/en/); Ca' Foscari University of Venice's new master's degree programme: Contemporary Art in the Arab World, Iran and Turkey (https://www.cafoscarichallengeschool.it/en/master/contemporary-art-in-the-arab-world-iran-and-turkey/), etc.

6 Some of the local and regional initiatives are MACAM (Modern and Contemporary Art Museum) in Alita/Northern Lebanon and AlMawrid at NYU Abu Dhabi, amongst others.

erto largely neglected art historical developments, such as those during the Lebanese civil war (1975-90). The focus is on visual artists who exhibited in Lebanon (and abroad) before and during the war. This will eventually extend to the present. Part of this diverse group, both in terms of media (e.g. painting, collage, print, sculpture, installation, tapestry) and cultural and art historical backgrounds, are artists such as Shafic Abboud, Paul Guiragossian, Alfons Philipps, Thea Porter, Etel Adnan, Dhia al-Azzawi, Saloua Raouda Choucair, Fateh al-Moudarres, Juliana Seraphim, and Mohammad Rawas, among many others. LAWHA is also interested in art critics, gallerists, collectors, and other actors in the field as they represent an essential part of the network. The research is organised around three main clusters: artistic education, exhibitions, and the art market.

The specificity of Lebanon's history means it is particularly worthwhile to study the power relations between artists and institutions. Lebanon is regularly portrayed as a country with weak public institutions but a vibrant cultural sector. Lebanon has enjoyed a high level of cultural production as well as a high degree of circulation and mobility both to and from the country, with Beirut becoming the cultural capital of the Arab region in the late 1950s.[7] At the same time, Lebanon is defined by its experience of conflict and war. The project aims to explore and evaluate these factors and multiple layers that shape the history of art in Lebanon by reconstructing individual trajectories, contacts, and exchanges of artists and artworks based on archival documents and oral history.

LAWHA approaches the research subject from multiple perspectives: on the one hand, it examines local factors that have shaped the artistic field, such as the emergence of a middle class with an interest in art and the financial means to purchase artworks. It also looks at the emergence of art galleries and art criticism that both acted as patrons of emerging artists and styles. Regional factors also played an important role, such as the migration of artists and writers from neighbouring Arab countries to Beirut and the consecutive development of the city into an artistic and intellectual centre of the region, as mentioned above. Finally, global factors, such as Cold War cultural diplomacy, and organisations, such as the Congress for Cultural Freedom (CCF),[8] had their own impact on the local scene.

The following section will focus on how digitisation can be a chance for modern art from marginalised regions to gain more visibility and how to reconstruct context with the help of keywords.

7 For further information on Beirut as a cultural hub see for example Creswell 2019, Maasri 2020 and Rogers 2021.

8 For further information on the CCF and the role of the US in promoting abstract art see Creswell 2019 and Franke et al. 2021.

3 Emancipation Through Digitisation?

The increase in data networks between institutions and initiatives results in additional visibility via linked open data (LOD). This development has opened new doors with regards to information retrieval as "it brings to light the long tail, i.e. everything that was lost in the canonisation process" (Kohle 2013, 36).[9] Included are therefore also artworks, artists, writings, and intellectual productions that have hitherto been outside the respective canons. According to Hubertus Kohle, this "de-canonisation effect" (36; German *Entkanonisierungseffekt*) is due to a changed methodical workflow in which search queries are not answered based on pre-selections but are rather purely data-driven. This means that the retrieval process has become more 'egalitarian', in that both well-known and lesser-known artists, writers, and their works can now be shown as relevant results.

> For in the *long tail* of the digital, an object becomes available at least and is only a mouse click away from the work of the century. In the analog world, it was either never even present, e.g. if it had not been addressed by the scientific literature, or it was published in such a marginal place that it did not enter the researchers' field of attention. (37)[10]

However, according to Richard Rogers, this has to do with ambiguous (as opposed to unambiguous) search queries that broaden the scope of the results in an often-fruitful way (Rogers 2017, 93). Search results that are open to ambiguity will most likely also include relevant keywords that may otherwise have escaped the hit list.

As a result of what could be interpreted as an 'emancipation effect' – but which in reality is more dependent on technical than on discursive processes – simplistic dichotomies such as "periphery" and "centre" that underpin the history of modernism and its relation to other parts of the world have become more and more questionable. They are being invalidated by non-centric theoretical approaches such as "constellational modernism" (Seggerman 2019) or the history of contact (Kravagna 2017). These approaches reject a central core or narrative, thereby flattening hierarchies. Modernism is framed as a

9 Original quote in German: "Sie bringt den Long Tail zum Vorschein, alles das, was im Kanonisierungsprozess verloren gin". If not otherwise stated, all translations were made by the Author.

10 Original quote in German: "Denn im *Long Tail* des Digitalen ist ein Gegenstand wenigstens vorhanden und nur noch einen Mausklick vom Jahrhundertwerk entfernt. Im Analogen war er entweder gar nicht mehr präsent, z.B. dann, wenn die wissenschaftliche Literatur sich ihm niemals zugewandt hatte, oder er war an derartig marginaler Stelle veröffentlicht, dass er nicht mehr in das Aufmerksamkeitsfeld der Forschenden fallen konnte".

> series of overlapping and intersecting units as opposed to concentric circles emanating from the metropole. (Seggerman 2019, 8)

Seggerman's approach is particularly compelling as it implies a specific and finite number of connections evoked through trips, exhibitions, university degrees, and circulated textual and visual materials, which all play a major role in the LAWHA database and research project. What both approaches have in common is that they focus on individual contacts and exchanges, rather than on big narratives that often tend to overlook the details.

On closer inspection, the above-highlighted emancipation effect is only an indirect one since it is merely based on algorithms. Nonetheless, it is important to keep in mind that algorithms are not unbiased either and depend on factors such as the location of the search query and the browser history, for example. Also: what kind of information do search engines rank highly and which information is placed at the other end of the list? Theoretically, visibility can be actively promoted via keywords and linked open data and is as such tentatively emancipatory in the larger sense. Practically, the "googlearchies", that is the hierarchies established by Google's PageRank algorithms, "boost certain websites and bury others in the results" (Rogers 2017, 77) thereby reintroducing hierarchies in what was previously advertised as a field of democratic participation. Another important aspect of search engine results critique brought forward in the literature (e.g. by Rogers), are filters that deliver personalised and localised results rather than universal ones. Rogers points out that this is not least in part due to users' preference settings:

> There is the question of detecting how many and which results are personalized in one form or another, according to one's location (country as well as locality), language, personal search history as well as adult and violent content filter. (Rogers 2017, 80)

Equally important is the fact that data is largely entered by humans and therefore always subjective and selective. An imbalance is therefore inscribed into every data collection and entry process: which data is recorded, and which is not? This is highly interpretative. One could say that the digital world is a reproduction of the analog world with all its biases and power imbalances, but with the promise of greater democratic participation (despite Google's reintroduction of hierarchies as pointed out by Richard Rogers). Regardless of this, the potential of the digital world to bring together and to semantically link information of all kinds and provenances is something that has previously never been possible on such a large scale – even if it appears only as part of the "long tail". Ideally, this would lead to a transregional network of artworks and artists, ideas and iconogra-

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phies, etc. that would allow for new discoveries, invite for exploration, and ultimately expand the canon. This is something that could be achieved in the digital world, and perhaps consecutively in the analog world too. However, one must be aware of the risk of distorting meaning when isolating documents from their original context, as will be explored later.

The focus in the following paragraphs will be on keywords that could help reconstruct the history of art in Lebanon and enhance its visibility. Firstly, some preliminary thoughts on the organisation of information and knowledge will be briefly introduced.

4 Knowledge Organisation in the Semantic Web

Although the terms information organisation and knowledge organisation are often used interchangeably, there is a fundamental difference between information and knowledge. Knowledge is organised as a network and has many interconnections and layers that are cross-temporal, cross-disciplinary, cross-regional, and cross-cultural among others. Knowledge consists of information, but also of insights or 'truths' that cannot always be captured in a medium. Orally transmitted knowledge, for example, is irreversibly lost once the chain of transmission is interrupted. Within the field of library and information science, however, the terms information and knowledge are used synonymously:

> Suffice it to say that both terms certainly are used, and with the same meaning, which is the organization of that which is known so that it might be the product of the process of information retrieval. (Smiraglia 2014, 13)

In order to be retrieved, information is by necessity medium related. It sometimes appears as data when it is measurable or verifiable information, such as that found in résumés.

> Information is sometimes defined in terms of data, such as 'data endowed with relevance and purpose.' A datum is given; it could be a fact or, at a more elemental level, a sense perception. (Svenonius 2000, 7)

However, information cannot always be converted into data, for example when it comes to information that is not factual but rather falls within the realm of abstract ideas, such as aesthetic reflections or philosophical considerations. Here, classification is much more difficult a task. Crucial to any database is information that can be assigned a date, size, or name (e.g. the foundation date of a gallery,

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its name, address, the number of exhibitions held). To push the definition one step further, one could also say: information becomes data if it can be measured and transferred into a structured, machine-readable form as part of a database. The essential goal of information systems is therefore to collect information in the form of data, to classify it, and – as in the case of digital databases – to create a machine-readable format to generate new, or enrich existing, knowledge in the future.

How is information organised in the semantic web? The semantic web is the subsequent development of the World Wide Web and a formal model for knowledge representation, exposing concepts and their relations to each other. It not only connects the data itself, but also its meaning and context. In the semantic web, machines can independently correlate content and data based on algorithms. How are the semantic web and ontologies connected? As a philosophical concept, ontology is concerned with the study of being. In information science, this terminology has been adopted to describe the structure of knowledge domains consisting of standardised terminologies and relations. The characteristics of ontologies – as opposed to simple databases – have been described by Tom Gruber as follows:

> In the context of database systems, ontology can be viewed as a level of abstraction of data models, analogous to hierarchical and relational models, but intended for modeling knowledge about individuals, their attributes, and their relationships to other individuals. […] For this reason, ontologies are said to be at the "semantic" level, whereas database schema are models of data at the "logical" or "physical" level. (Gruber 2008)

Ontologies are the building blocks of the semantic web. In contrast to philosophy where ontology as a concept is used in the singular form, in information science there are numerous ontologies, each describing a specific knowledge domain. Ontological considerations always play a key role in the design of databases. In every data model, there are assumptions about specific aspects of the world and the information that is to be captured. Determining which tables are created, which columns they consist of, and how the network of their relationships is designed, is the result of a specific take on 'reality', which is always highly subjective. It implies the pre-structuring of specific subject areas through the data model, which is certainly a reductive but, at the same time, unavoidable approach. The same subject area can be based on entirely different data models depending on the guiding questions. The "intellectual foundation" (Svenonius 2000) of knowledge organisation is therefore crucial.

Ontologies play an important role as reference models as they bridge otherwise disparate data models. They can also be helpful

in designing new ones. A data model that is based around a general view of a specific subject area allows the import of new data with a different structure without any major difficulties. One such conceptual reference model is CIDOC-CRM, which provides the "semantic glue"[11] to connect different sources of cultural heritage information. CIDOC-CRM is a formal ontology (as opposed to a domain ontology such as LAWHA) and a theoretical and practical tool for information integration in the field of cultural heritage. It provides definitions and a formal structure to describe concepts and relations used in cultural heritage documentation. LAWHA's data model is compliant with CIDOC-CRM as it models a specific knowledge domain within the field of cultural heritage. Hence, interoperability of the LAWHA ontology with other data models based on the same conceptual reference model is provided.[12]

How is the LAWHA ontology structured?[13] It contains the following items: Artwork, Exhibition, Person, Periodical, Book, Life Event, Collection, Organisation, Issue, Provenance Event, Parent Event, Document, and Contribution **[fig. 1]**. These elements of the database cover a variety of information related to the trajectories of artists and artworks such as: Who exhibited with whom and where? How is an artist's productivity interrelated with certain phases and geographical locations? Who did artists interact with (and who were they potentially influenced by)? How did artworks circulate (or did not)? How has the art market developed? How do publications interrelate with the development of the artistic field?

11 https://cidoc-crm.org.

12 LAWHA is not fully compliant with CIDOC-CRM. It is a rather complex museum standard, which is not necessary for LAWHA's purposes. However, in the future, institutions may want to use LAWHA's API (Application Programming Interface) to use the data. Full compliance can be provided at a later stage if needed.

13 LAWHA's data model was developed together with Valentina Pasqual and Marilena Daquino from the Digital Humanities Advanced Research Centre/DH.arc of the University of Bologna. The data model can be viewed here: Pasqual, Daquino 2022. https://doi.org/10.6084/m9.figshare.21542391.v1.

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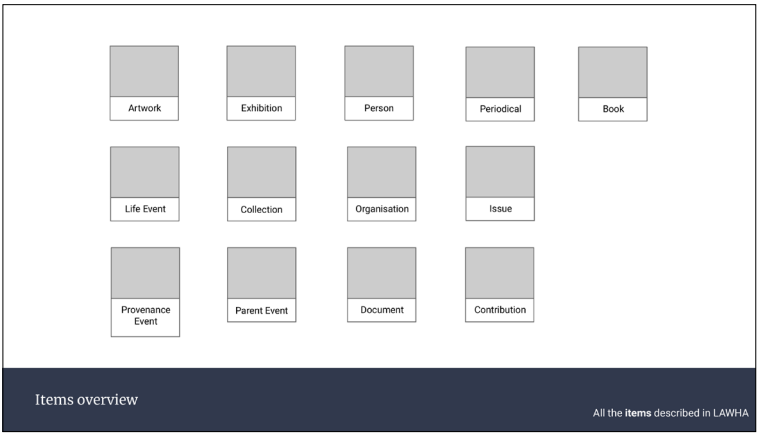

Figure 1 LAWHA data model: items overview. © LAWHA

To try and understand how the different items are related within the database, the item 'document' has been chosen **[fig. 2]**. The instances or types of documents are manifold, for example address books, letters, diaries, notebooks, sales lists, price lists, invitation cards, e-mails, etc. The document can be in relation to a person and/or an organisation (which can be the creator, a participant, a copyright holder, etc.); it can also be in relation to a book or a collection (as part of the collection or within a publication). Theoretically, other relations are possible, but these are the ones that are relevant for LAWHA and its research questions. Data modelling is a process which evaluates the relevancy of information in light of the guiding research questions. Relevance is more important than completeness.

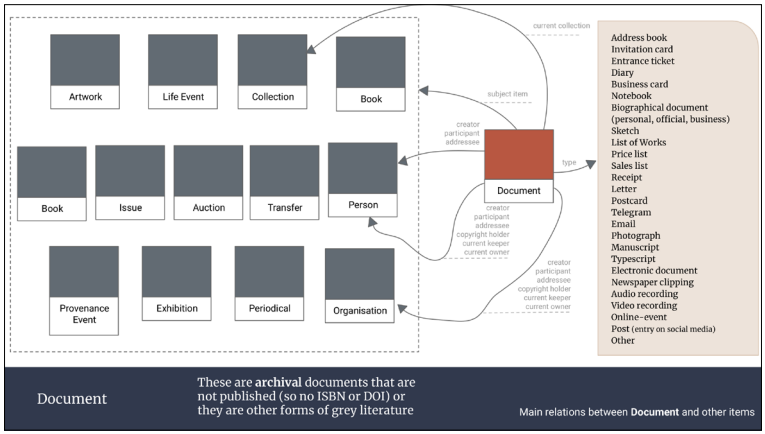

Figure 2 LAWHA data model: item 'document' and its relations within the database. © LAWHA

The different items in the data model are not only interrelated but are also composed of many facets, which themselves are guided not least by potential interests of future users (mainly scholars, curators, students, teachers, and artists). These comprise information such as 'title', 'creator', 'participant', 'language', 'genre' but also media related data such as materiality, dimensions, colour, etc. **[fig. 3]**.

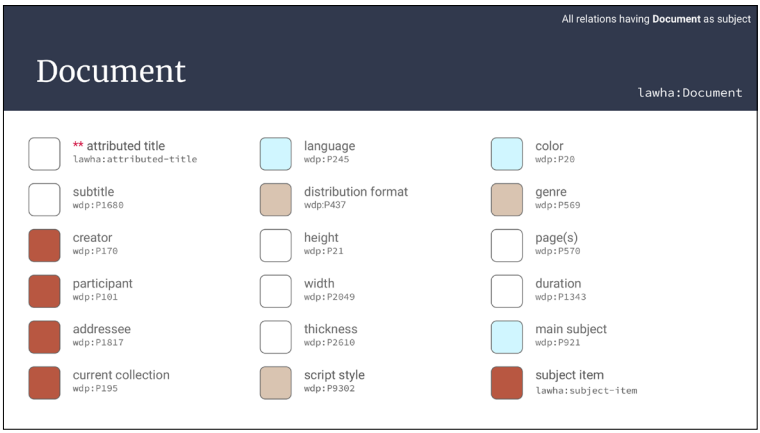

Figure 3 LAWHA data model: item 'document' and its attributes. © LAWHA

Another more complex example within its network of relations is the item 'person' **[fig. 4]**. In contrast to the item 'document', 'person' is at the centre of all possible relations. The arrows pointing towards

'person' are relationships where the person is the subject, i.e. 'Artist x created artwork y' or 'Collector x is the current owner of collection y'. These relationships are usually expressed in triples consisting of subject, verb, and object, which form the basis of the semantic web. 'Person' also has a relationship to 'organisation' which it can be a member of or represented by, for example. 'Organisation' is independent from 'person' and on a higher structural level than an individual; therefore, the arrow points in the opposite direction, namely from 'person' to 'organisation'.

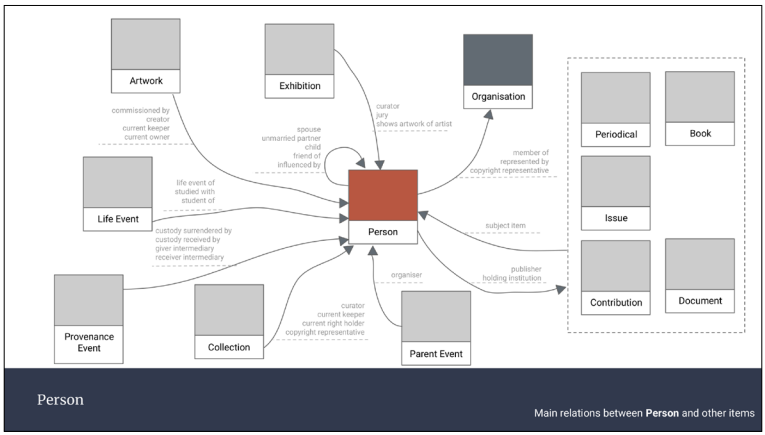

Figure 4 LAWHA data model: item 'person' and its relations within the database. © LAWHA

These examples and their network of relations apply to all items within the LAWHA ontology. When organising knowledge, not only does the data model play an essential role but so do the keywords too, as will be further explained in the following section. This is particularly important for the retrieval of data. Keywords are also essential for the contextualisation of knowledge and to link it to information inside and outside of the database. They establish relations such as those between persons, events, ideas, movements, literature, music, or political concepts.

5 Keywords as Entry Points to Knowledge

The LAWHA database and digital platform will be fully searchable, which means that users will be able to conduct keyword searches relating to, for example, educational institutions (e.g. showing the names of all students at any one time), exhibition places (e.g. show-

ing all the exhibitions that took place there and all the artists that exhibited together), years and time periods (e.g. showing all exhibitions that took place or artworks produced in a particular year, exhibitions within a certain time period, etc.), cities (e.g. showing all artists that came through it and when), artists, gender, artworks (e.g. exhibition history, movement), critics (e.g. their reviews/writings). Advanced search options will also be possible (e.g. searches for all Lebanese women artists in Paris in 1964). There are several possibilities to conduct keyword searches, among them are the guided and the free search, which can also be combined. The guided search is helpful in order to give users an idea of what they can search for.[14] In the respective fields, they can select from a drop-down menu among all indexed keywords (see the context vocabulary presented further down). The free search, on the other hand, is advantageous when documents are fully searchable, as it allows users to search for a combination of words, names, or numbers, for example.

For precise information retrieval and to make it linkable via LOD, using controlled vocabularies in the database rather than simple keywords is important. Controlled vocabulary is normalised vocabulary, which means that it excludes ambiguities and has a hierarchical relationship to other terms. Another advantage is the multilingualism of controlled vocabulary. This is the case with the Getty Art and Architecture Thesaurus (AAT),[15] which lists terms in multiple languages. Arabic translations are still rare, but something that should, and definitely will, be developed in the future. AAT is crucial and relatively comprehensive in this regard and extends beyond the actual description of artworks to materials, technique, genre, pictorial elements, and subjects. The AAT also provides vocabularies for the description of exhibition, document and institution types, distribution formats, as well as publication types and genres, for example.[16] Wikidata also plays an important role but is – at least in its current state – more suitable for individual than for conceptual terms, such as those provided by the AAT.

LAWHA uses controlled vocabulary to describe the different classes and their relations within the structure of the database (mainly Wikidata and CIDOC-CRM in addition to some LAWHA specific vocabularies). For the description of artworks and documents an internal thesaurus with relevant vocabularies from the AAT and Wikidata

14 See the example of the Accademia di San Luca cited by Joshua Sternfeld, 2011, 558-60.

15 `http://www.getty.edu/vow/AATHierarchy?find=wood&logic=AND&note=&english=N&prev_page=1&subjectid=300012512`.

16 For further information see Harpring 2013.

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will be created.[17] What can be done when appropriate vocabularies cannot be found? One possibility is to create new entries in Wikidata, and thereby references, with a unique identifier that others can also use. In the future, LAWHA may also suggest terms that are relevant to the AAT or Arabic translations of specific terms to be included in the Getty thesaurus. This is a longer process, however, that will not provide short term solutions for missing vocabularies. Another possibility is therefore to work with SKOS (Simple Knowledge Organisation System)[18] whenever an exact term is not available, e.g., 'group exhibition'.[19] The latter is an important term for the LAWHA knowledge organisation which is neither available in the AAT nor in Wikidata. However, with SKOS it is possible to match this term with the AAT entry 'exhibition' by assigning it a mapping relation such as 'skos:broadMatch', for example.[20] Since this term is a concept rather than an individual term, AAT is most suited to this specific case. The advantage of using SKOS is that knowledge organisation systems or single terms can be expressed and published as machine-readable data. When organising domain specific knowledge as in the present case, it is important to focus on the guiding research questions and organise the vocabularies accordingly, rather than settling for the available, and at times inaccurate, vocabularies. SKOS can therefore provide effective solutions to bridge the gaps when describing certain phenomena.

Despite all of this, the formation of a consortium consisting of libraries, research institutions and projects, museums, and galleries that focus on the development of Arabic and context specific vocabularies including terms from art, literature, film, music, theatre, and culture would be a trailblasing initiative. So far, there is no approved authority within the Arab countries to mandate the use of a particular tool or standard.[21] Building one's own multilingual thesaurus (includ-

17 LAWHA has discarded the option of using the Iconclass classification system. Despite it being used in many museums around the world, and being a very useful tool for the classification of artworks prior to the twentieth century, it is not practical for non-European contexts as Iconclass is mainly based on Western iconography (`http://www.iconclass.org/help/outline`).

18 `https://www.w3.org/TR/skos-reference/#L879`.

19 LAWHA is grateful to NFDI4 Culture (`https://nfdi4culture.de/de/index.html`), notably Angela Kailus and Katja Sternitzke, for sharing their knowledge.

20 For the possible mapping relations refer to: `https://www.w3.org/TR/skos-reference/#L4138`.

21 In their online-lecture "Challenges facing catalogers in describing and indexing Middle Eastern books and periodicals" (9 February 2022), Fatme Charafeddine and Basma Chebani (American University of Beirut Libraries) highlighted the fact that initiatives for knowledge organisation are not comprehensive and, in most cases, discontinued. There is a need to create Arabic ontologies with specialised domains. The speakers stated that many of the available Arabic thesauri such as Maknaz, Agrovoc,

ing Arabic), is a practical way to capture context-specific controlled vocabulary, and at the same time achieve more visibility for the arts and cultures from the Arabic-speaking world. This is a long-term project that will depend greatly on the commitment of its participants.

6 How to Capture Context?

What do we mean when we speak of contextual vocabulary and why is it important? Context provides information on the political, cultural, intellectual, artistic etc. backgrounds of individual artistic approaches and processes and helps to situate artworks in their respective environment. Whilst this does not mean that we can draw linear or direct conclusions concerning the creational process itself, creation does not, however, take place in a vacuum and is always related to the environment from which the artist draws their inspiration. This can at times be very personal and intimate, or barely discernible, whilst at others it is very explicit or occurs as a reaction to political developments.

This leads to the question of provenance of such a context-related vocabulary. It is sometimes part of the iconography of the artwork itself, most often it appears in the discourses, debates, correspondence, and artists' writings that can be found in the archival documents and in secondary sources, such as scholarly publications. When attempting to revisit or reconstruct art history, this kind of information is essential as it helps to put the works in perspective. However, one has to be careful not to essentialise. Any reconstruction can only be tentative. On the other hand, providing context and associating artworks and artists with certain ideas or movements, for example, can provide a fresh outlook on things.

The LAWHA data model offers numerous possibilities to link persons, documents, artworks, ideas, concepts, art movements, and other items with each other, thereby creating a network of diverse information. Contexts that are important to the LAWHA project extend from the political context, including subcategories such as conflicts, political movements and activism, forms of government, and person-

Shamaa, and POHA (Palestinian Oral History Archive) could be converted to ontologies using RDF. The problem is that many vocabularies cannot be found when using Library of Congress Subject Headings (LCSH). This is due to "biased and superficial subject classification", especially in the fields of Islam, Arabic language and literature, history, and politics of the Middle East. The Arab Union Catalog, initiated by the King Abdulaziz Public Library, Saudi Arabia, provides a bibliographic database and authority files. One of its aims is the development of standards and tools for knowledge production. However, the catalogue is limited in terms of diversity and inclusion, said the two speakers. The recording of the lecture can be found here: `https://www.youtube.com/watch?v=eSNW2gQVJXc`.

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al experiences (e.g. exile, friendship, censorship), to the cultural context, which includes cultural debates, spiritualism and religion, to the artistic context, including artistic and aesthetic debates, or schools.

In the following, a preliminary, but by no means comprehensive, list of possibly relevant keywords in the context of LAWHA has been compiled. These keywords originate from Wikidata. The combination of the letter 'Q' followed by a sequence of numbers indicate the Wikidata identifier. In the case that keywords cannot be found, LAWHA will create Wikidata entries. The main purpose of listing them here is to give the reader an idea of what the context vocabulary may look like and how it may be structured. The context extends beyond Lebanon to include neighbouring Arab countries as well as events on the global scene, such as the Vietnam war. Many artists, writers, and intellectuals from neighbouring Arab countries came to Lebanon in the 1950s, 1960s, and 1970s transforming the capital Beirut into a centre for alternative ideas, political convictions, artistic practices, and motifs. All this is part of the context and will be reflected in the vocabularies.

As mentioned above, the keywords have their provenance in the archival material and secondary sources, but also in the artworks themselves (for example with regard to iconographic information) and serve to link artists to historical events, debates, and artistic reflections of the time. An article on visual art in a Lebanese Arabic language journal from the 1950s, for example, will probably include questions of artistic authenticity and identity, the relation between East and West, the choice of colours and subjects, and the role of the artist in society. Whereas keywords such as 'authenticity' and 'identity' can be found in Wikidata, more descriptive relations such as those between East and West or the 'role of the artist' have to be used in a full text search query. Two problems relating to Arabic text arise here, one of which can be solved relatively easily: 1) Arabic sources are up to now not fully OCR readable; 2) the keywords in Wikidata are in English and might on rare occasions have an Arabic translation. LAWHA will therefore strive to add Arabic keywords to the Wikidata entries.

In the following listing, the vocabularies are bundled into three main categories – political, cultural, and artistic context – and a finite number of subcategories each containing specific entities. The structure of the list will later appear in a guided search and help users to initiate queries.

1. Political context

– *wars*
Lebanese Civil War (Q208484), Lebanon War (Q49104), Six-Day War (Q49077), Gulf War (Q37643), Vietnam War (Q8740), World War I (Q391),

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World War II (Q362), Cold War (Q8683)

– *forced displacements*
nakba / forced expulsion of Palestinian Arabs from Israel, 1947-48 (Q3266633)

– *massacres*
Sabra and Shatila massacre (Q208199), Tel al-Zaatar massacre (Q2359563), Armenian genocide (Q80034)

– *colonialism*
French mandate for Syria and the Lebanon (Q139708), Mandatory Palestine (Q193714)

– *historical entities*
Ottoman Empire (Q12560)

– *political movements* / *activism*
leftism (Q2660346), communism (Q6186), nationalism (Q6235), Syrian nationalism (Q1428893), Arab nationalism (Q114213), Pan-Arabism (Q193476), feminism (Q7552), fedayeen (Q989678)

– *political concepts*, *ideologies*
ummah / nation (Q205766), liberalism (Q6216), confessionalism (Q2749417), Marxism (Q7264), secularism (Q216920)

– *personal experiences*
imprisonment (Q841236), emigration (Q187668), exile (Q188863), forced displacement (Q837556), censorship (Q543), friendship (Q491)

2. Cultural context

– *cultural debates*, *discourses*
Nahda / cultural movement in the Arabic speaking world (Q1520921), cultural identity (Q1368367), Orient (Q205653), Western World (Q160381), authenticity (Q21074933), imitation (Q1131737), adaptation (Q1213562), cultural heritage (Q21022), modernity (Q11084414), mythology (Q9134), tradition (Q82821), orientalism (Q42865), colonialism (Q7167), postcolonialism (Q265425)

– *ancient civilisations*
Mesopotamia (Q11767), Sumer (Q35355), Phoenicians (Q1048468)

– *philosophy*
humanism (Q46158), morality/morals (Q48324), materialism (Q7081)

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– *religion*
Islam (Q432), The Qur'an (Q428), Christianity (Q5043), atheism (Q7066), Sufism (Q9603), Mysticism (Q16861950), spiritualism (Q2636432)

– *scientific context*
Mathematics (Q395), Geometry (087)

3. Artistic context

– *artistic debates*
abstract art (Q128115), figurative art (Q162217), colors and forms, modernism (Q878985), art for art's sake (Q772046), taste (Q1143012), beauty (Q7242), folklore (Q36192)

– *movements*
Hurufiyya movement (Q55614094), School of Paris (Q273506), surrealism (Q39427)

In practice, the relevant keywords will be listed in the database together with the metadata of the respective document, i.e., a diary, letter, manuscript, etc., which in turn is linked to its creator **[fig. 5]**. Contextual vocabulary, however, is not limited to artworks and documents but also includes the categories 'book', 'contribution', 'issue', 'periodical', 'exhibition', 'organisation', and 'person', which provide the possibility for entries via the field 'main subject".

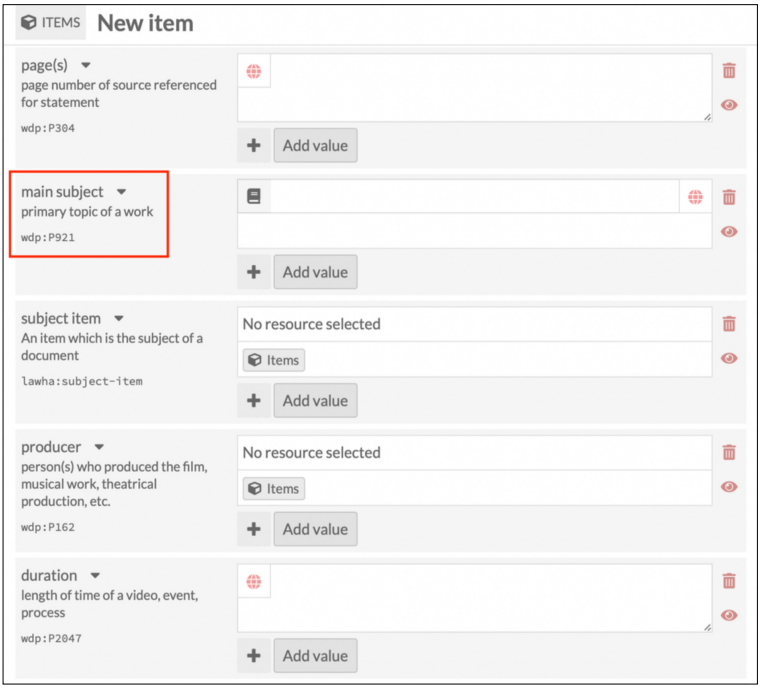

Figure 5 Screenshot of LAWHA's Omeka S database showing an excerpt of the item 'document' and the detail 'main subject' where contextual vocabulary can be added. © LAWHA

In the future – once all database entries have been edited and reviewed and the front-end has been designed – queries on specific artists will show a) all data available in the artists' dossiers, i.e. the date and place of birth, places of education, teachers, exhibitions, awards etc. (see **figs. 6** and **7** database item 'life event'); b) all their artworks that are part of the database (and ideally they will link up to works in other collections outside of the LAWHA database); c) all related archival material in the LAWHA database (at least the ones that can be made accessible to the public without any legal or ethical constraints; others may be available upon request or restricted to in-place-use); d) relations to other persons (artists, writers, composers, etc.), other artworks, ideas, debates, schools, movements, etc.

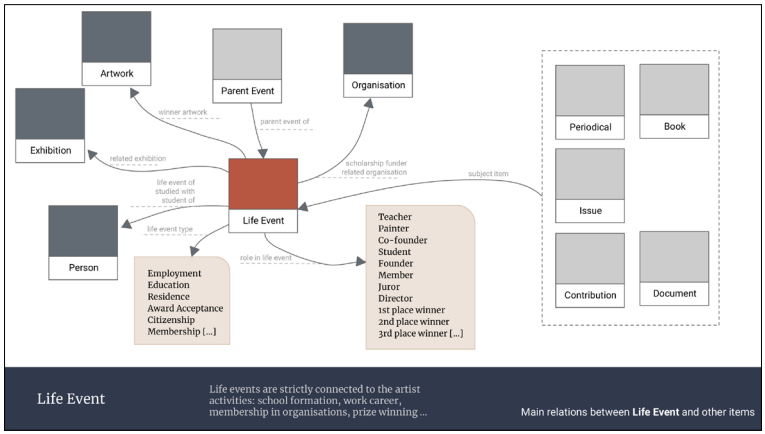

Figure 6 LAWHA data model: item 'life event' and its multiple relations. © LAWHA

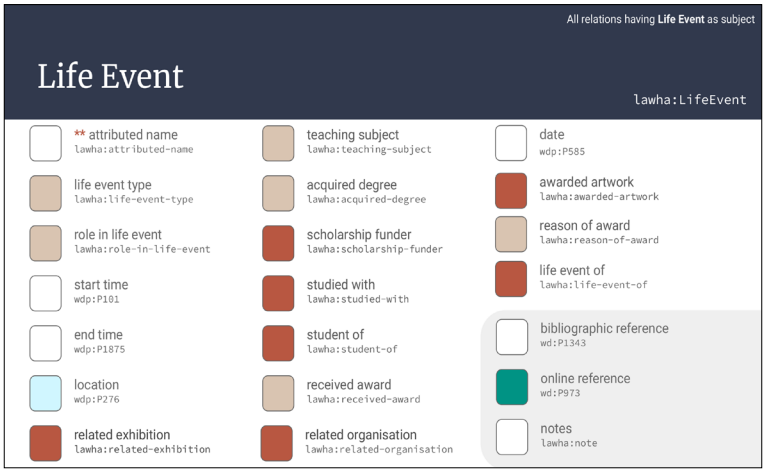

Figure 7 LAWHA data model: item 'life event' covering e.g. instances 'education', 'employment', and 'award acceptance'. © LAWHA

7 Conclusions

This paper aimed to outline some of the factors that come into play when attempting to reconstruct knowledge using digital means. Digital art history with its capacity of visualising networks, patterns, and trajectories certainly has its benefits. However, this is where the real research and questions commence: which new questions may derive from this? What can we read into these patterns and how can we analyse the data qualitatively and in more detail? The fact that a critic has written many articles for a newspaper or magazine, for example, does not say anything about the importance of their writings in terms of outreach or intellectual input. Van Es and Schäfer point out that despite data sets being able to provide new insights through granularity, "their possibilities are frequently overestimated" (2017, 15). Often, these insights remain at the surface and are expressed in the well-known network graphs consisting of nodes and edges ("hairballs" or "bowls of spaghetti", Venturini et al. 2017, 168) that mostly illustrate what we already know. However, some of the present, and perhaps all future, tools carry the promise of an "enhanced capacity to ask new humanistic questions that would otherwise not be possible" (Sternfeld 2011, 549).

The article has elaborated on the importance of keywords and controlled vocabularies that act as the glue holding the different types of data together and in relation to each other, and makes information classifiable and retrievable. The digital can be a chance for more inclusiveness with regard to art historical relevance whether locally, regionally, or globally. When reconstructing knowledge with selected pieces of formerly coherent archives, it is important to provide context information about the sources through metadata. Transparency regarding the limitations of the database and its ability to provide historical accuracy is key. Highlighting specific aspects of history and thus creating relevance may lead to false conclusions and eventually a distortion of history. But is this not the case with any historical representation? It is therefore essential to point out that the priority of the LAWHA database is to answer specific research questions and not to strive for completeness. Therefore, the goals of database projects and digital collections differ significantly from those of archives. They do, however, complement each other. The decontextualisation and recombination of database information that has previously not been put in relation leads to new narratives that might sometimes fall more into the domain of fiction than that of facts. These "database histories", as Steve Anderson coins them, are

> histories that are comprised not of narratives that describe an experience of the past, but collections of infinitely retrievable fragments, situated within categories and organized according to predetermined associations.

> A database of 'retrievable fragments' invites users to generate associations previously unconsidered, but, at the same time, it can establish the dangerous precedent of generating erroneous narrative constructions. A search query can lead to the false expectation that all hits within the query possess an inherent link to one another. Users may be tempted to construct false relationships among disparate pieces of information, swayed by the notion that they share some commonality under the umbrella of a search term. (Sternfeld 2011, 556-7)

Therefore, information needs to be contextualised historically as much as possible to limit erroneous associations and conclusions.

Finally, the aim of LAWHA is not to reconstruct history but rather to offer the means for the rereading or reinterpretation of history and to gather information for possible artists' biographies in the future. In conclusion, reconstruction may be a misleading term since the original state can never be reassembled retroactively. Any *re*construction will always be a *new* construction.

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Re-inventare il museo e le sue narrazioni
L'esperienza di Palazzo Grimani durante i lockdown

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Abstract The essay analyses the impact of the COVID-19 lockdowns during the pandemic on the practices of museum storytelling in the context of social networks, particularly in relation to the Museo di Palazzo Grimani in Venice, Italy. The spring 2020 lockdown constituted a totally new situation for museums, whose forced closure caused the fundamental daily relationship with visitors to fail in an unexpected and all-encompassing way. At this juncture, social media have provided the space for an effective rethinking and reconstruction of the Museum's narratives, starting from their inherent potential and the need to interpret the external need, though not to substitute a real on-site visit. This paper is based on a practical and direct experience, thus trying to benchmark the specific case study of Palazzo Grimani and inserting it into the wider academic literature that developed out of the challenges fostered by the pandemic.

Keywords Museum. Social network. Storytelling. Timing. City. Irony.

Sommario 1 Museo e musei nell'era COVID-19: alcune premesse necessarie. – 2 Le pagine social del Museo di Palazzo Grimani prima della pandemia. – 3 Quali strumenti per quale pubblico. – 4 A tu per tu con la pandemia: tra primo e secondo lockdown. – 5 Spazio e tempo per una nuova forma di Museo. – 6 I mezzi socio-digitali nella progettazione museale presente e futura. – 7 Conclusioni.

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1 Museo e musei nell'era COVID-19: alcune premesse necessarie

Sono rari i momenti della storia più recente, da quando cioè i musei si sono definiti in senso ontologico e metodologico, in cui un evento inaspettato e globale ha avuto effetti così importanti sulla loro gestione e valorizzazione come la recente pandemia da COVID-19. Tale congiuntura, che dura ormai da più di due anni con una serie di evoluzioni repentine e non programmabili, è forse paragonabile solo alle situazioni belliche, per il fatto di aver costretto gli istituti a una chiusura forzata del tutto inattesa verso il mondo esterno, e, talvolta, a un'interruzione più o meno prolungata del lavoro interno alla struttura stessa, ma si è altresì rivelata una straordinaria occasione di (auto)riflessione per le istituzioni museali, nonché di elaborazione di nuove metodologie e nuovi strumenti. Le fasi di lockdown hanno garantito spazi e tempi preziosi di sperimentazione, soprattutto nell'ambito della comunicazione e della valorizzazione, per i musei e le istituzioni culturali ad ampio raggio e in modalità tra loro eterogenee, ma accumunate dal fatto di essersi svolte unicamente in ambiente digitale, interconnesso e ipermediale: quello del web e, soprattutto, dei social media. Crediamo sia opportuno sottolineare come il ricorso al digitale non fosse una delle tante possibilità a disposizione, ma una necessità, se non una scelta obbligata, e che questo sia avvenuto senza che potesse darsi nell'immediato quella che è da sempre considerata componente imprescindibile della relazione con il pubblico: il contatto diretto, fisico con il patrimonio culturale materiale.[1]

Il presente contributo intende riportare e analizzare il lavoro che chi scrive ha condotto durante i mesi della pandemia – nello specifico il periodo compreso tra l'inizio del primo lockdown e la fine del secondo – attraverso la gestione delle pagine social del Museo di Palazzo Grimani,[2] istituto statale non autonomo del Ministero della Cul-

La stesura materiale dei paragrafi è stata suddivisa fra gli autori nel seguente modo: V. Finocchi paragrafi 1, 3, 5 e 6; M. Mazzocco paragrafi 2 e 4; conclusioni comuni. Si specifica tuttavia che l'articolo è frutto di un confronto intenso tra i due autori, pertanto la divisione dei paragrafi riguarda prettamente la stesura del testo e non altresì la generalità della metodologia di ricerca né le osservazioni scientifiche risultanti.

1 Tale senso di necessità impellente era probabilmente motivato dal fatto di trovarsi tutti nella medesima condizione, ossia da un ribaltamento del significato di normalità in quella situazione: normale, appunto, era essere chiusi al pubblico e non il contrario. Era, insomma, l'intero 'ecosistema istituzionale' a reagire. Solo il Museo Archeologico Regionale 'Antonino Salinas' di Palermo aveva sperimentato con grande efficacia l'utilizzo dei social media in un momento di eccezionale chiusura al pubblico, un caso studio molto interessante (Bonacini 2016; 2020) e già riconosciuto «un caso concreto di successo di uso dei social network» (Volpe 2020, 72).

2 Come spesso accade negli istituti statali, il ruolo di Social Media Manager è incarnato da personale interno con o senza incarico specifico, coadiuvato, soprattutto per la

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tura.[3] Si tratta di un museo di medie dimensioni, che oggi espone collezioni di scultura, pittura e arredo antico che richiamano le passioni collezionistiche dell'antica famiglia patrizia che lo possedeva, i Grimani di Santa Maria Formosa, per l'appunto. Per molto tempo, però, è stato 'museo di sé stesso', poiché metteva in mostra prevalentemente le decorazioni ad affresco e stucco realizzate tra XVI e XVIII secolo da diversi committenti e artisti, in particolare dal patriarca Giovanni (1501-1593), al quale si deve anche la radicale trasformazione del precedente edificio medievale in un palazzo Cinquecentesco su modello antico e dei coevi palazzi romani rinascimentali. Un luogo della cultura, dal punto di vista del patrimonio custodito, complesso e unico nel panorama veneziano, ricco di 'narrazioni' visibili e invisibili; allo stesso tempo, tuttavia, un museo statale sottoposto a numerosi vincoli normativi e procedure di carattere amministrativo, che, sebbene imprescindibili, tendono a complicare o a rallentare i processi di aggiornamento delle metodologie e degli strumenti di lavoro rispetto alle tendenze museologiche più innovative, comprese quelle che prevedono l'utilizzo di tecnologie e media digitali.

Crediamo sia possibile oggi, a distanza di poco più di un anno dall'ultima riapertura del museo al pubblico nel maggio 2021, compiere un primo bilancio di questi anni di progettazione digitale in remoto, cercando di delinearne i caratteri peculiari e inediti. Chi scrive non ha dunque la pretesa di presentare quella del Museo di Palazzo Grimani come un'esperienza rappresentativa di tutto il panorama dei musei italiani o anche solo degli istituti statali (Agostino, Araboldi, Lampis 2020; Vassalli di Dachenhausen 2021); l'obiettivo, che muove da una descrizione puntuale delle attività svolte, è collocarla all'interno di più ampie riflessioni di carattere metodologico, al fine di stimolare la discussione e il confronto. La questione era già nota da tempo alla letteratura scientifica di ambito museologico[4] e, d'altra parte, questa e altre numerose esperienze costituiscono un mi-

produzione di contenuti scientifici e didattici, dalle figure tecnico-scientifiche; in questo caso Marco Mazzocco, assistente tecnico del museo con incarico di Responsabile della comunicazione social dal 2016, è affiancato da Valeria Finocchi, dal gennaio 2022 direttrice del museo, dove in precedenza svolgeva servizio in qualità di Funzionaria Storica dell'Arte con incarichi relativi alla gestione e cura delle collezioni e del patrimonio custodito e di responsabile dei servizi educativi e delle attività divulgative e didattiche.

3 Il Museo di Palazzo Grimani afferisce alla Direzione regionale Musei Veneto. Si tratta di un museo giovane, poiché inaugurato nel 2008 dopo circa trent'anni di restauri del Palazzo, acquistato nel 1981 dello Stato italiano in prelazione. Solo dal 2019, grazie alla collaborazione della Fondazione Venetian Heritage, è iniziato un processo di riallestimento delle sale, a cominciare dalla celebre Tribuna, mirato a riportare nell'edificio parte della collezione di antichità che questo ospitava nel Cinquecento e a evocare i fasti di una dimora patrizia veneziana del Rinascimento. Si veda Bristot 2008.

4 Giaccardi 2012; De Gottardo et al. 2014; Sanchez Laws 2015; De Biase, Valentino, 2016; Asproni 2017; Garubbo 2018; Sordi 2018.

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surato banco di prova per verificare la validità degli strumenti metodologici consolidati negli ultimi quindici anni di ricerca sul tema, a cui vanno aggiunte fondamentali nuove acquisizioni.

Fin dalla primavera 2020, infatti, sono state condotte analisi sul rapporto tra musei e pandemia, le quali hanno avuto il merito di raccogliere, strutturare e rendere leggibili i dati relativi a una quantità notevole di esperienze, concentrandosi in particolar modo sull'uso del digitale, fin dal principio emerso quale tratto saliente di questa fase storica. Promotori e conduttori di tali iniziative sono stati, in ambito internazionale, l'International Council of Museums (UNESCO, ICOM International 2021) e il Network of European Museum Organisations (NEMO).[5] Nel contesto italiano, invece, fin da subito si è mosso in questo senso il Ministero della Cultura (allora ancora MIBACT) con un sondaggio sui *Pubblici dei musei italiani durante il lockdown* nella tarda primavera 2020,[6] e la Fondazione Scuola Beni Attività Culturali, creata dallo stesso Ministero della Cultura (MIC), che ha promosso la ricerca *Musei In_Visibili. Visioni di futuro per i Musei Italiani per il dopo emergenza Covid-19*, condotta nel 2020 e i cui risultati finali sono stati resi noti a giugno 2021.[7] Ulteriori ricerche sono state realizzate dall'Osservatorio Culturale Piemonte (2019; 2020) e dall'Osservatorio Innovazione Digitale nei Beni e Attività Culturali del Politecnico di Milano (2020), quest'ultimo costantemente impegnato nel rilevare i maggiori trend dei musei italiani sebbene purtroppo spesso limitati agli istituti di maggior peso e dimensione. Non entreremo nel merito dei dati, poiché già ampiamente commentati sia nel contesto accademico e museale[8] che dall'opinione pubblica.[9] Ci interessa piuttosto evidenziare quanto questi abbiano stimolato analisi e riflessioni che fungono da utili termini di confronto e verifica del lavoro nei contesti museali,[10] sebbene sia forse prudente mantenere una

5 I contributi frutto dei sondaggi NEMO sono scaricabili all'indirizzo: `https://www.ne-mo.org/advocacy/our-advocacy-work/museums-during-covid-19.html`.

6 Condotto da Annalisa Cicerchia e Ludovico Solima.

7 La Fondazione ha costituito «un osservatorio dei numerosi contributi di dati e riflessioni, prodotti in Italia e all'estero, su quanto stava accadendo nel mondo delle istituzioni museali» attraverso una accurata ricognizione della letteratura nazionale e internazionale di settore, al fine di individuare i «32 effetti dell'emergenza sanitaria che con maggiore frequenza sono stati indicati [...] come capaci di produrre cambiamenti rilevanti per il futuro», sul cui ordine di importanza sono stati interrogati centinaia di professionisti museali (Cicerchia, Minuti 2021, 6).

8 Un'analisi dettagliata delle campagne di rilevazione condotte in ambito nazionale e internazionale è stata svolta da Landi e Marras (2020).

9 Basta una semplice ricerca Google con le parole 'musei', 'digitale', 'social' per rendersi conto di quanto il tema è stato, ed è tuttora, discusso anche al di fuori del mondo dei musei in senso stretto.

10 Per quanto riguarda il presente contributo, che intende analizzare il rapporto tra musei e COVID-19 a partire dalle consapevolezze di oggi e che dunque prenderà in con-

certa cautela nell'assegnare a quanto emerso in questo ultimo frangente un valore dogmatico, quanto un carattere 'programmatico'.[11]

Un'ultima premessa riguarda una questione di carattere solo apparentemente terminologico, relativa cioè all'ambito di lavoro nel quale si colloca questa stessa esperienza: non più solo, infatti, il ristretto campo della 'comunicazione' museale,[12] ma l'intero sistema della 'valorizzazione', così come definita dal Codice dei Beni Culturali e del Paesaggio.[13] Si tratta di uno scarto sostanziale che la pandemia ha contribuito senza dubbio a chiarire (se non proprio a provocare), soprattutto per i musei che facevano un uso limitato (quantitativamente e qualitativamente) dei social network, i quali, dal marzo 2020,

siderazione le diverse fasi di lockdown nel loro sviluppo e non come singoli episodi, ci si è orientati prevalentemente verso le riflessioni prodotte nel 2021 e nel 2022, che cioè recepivano, appunto, l'esperienza dell'arco temporale di riferimento. È comunque opportuno ricordare che già dalla tarda primavera 2020 sono state pubblicate ricerche e organizzati convegni e giornate di studio sul tema, che ovviamente prendevano in analisi quanto accaduto fino a quel momento e che dunque fotografavano situazioni che, per l'evoluzione repentina che ha caratterizzato la pandemia e le sue conseguenze, si sviluppavano altrettanto rapidamente con esiti anche molto diversi. Si pensi ad esempio alle forti differenze di approccio e strumenti applicativi utilizzati tra il primo e il secondo lockdown nei musei, differenza sulla quale ci soffermeremo nelle prossime pagine analizzando il nostro caso specifico. Contributi significativi di questa fase 'intermedia' sono Benedetti 2020; Crippa 2020; Mottola Molfino 2020; Primerano 2020; Toffoletti 2021.

11 Tale carattere contraddistingue buona parte della letteratura scientifica post pandemia, i cui principali titoli italiani citiamo in queste pagine e alle cui bibliografie generali rimandiamo per ulteriori approfondimenti.

12 Effettivamente, nel relazionarsi con gli studi di settore e i documenti prodotti dagli organismi internazionali, ci si rende conto che il discorso riguarda ancora prevalentemente la *comunicazione* digitale, specialmente per ciò che concerne i social network. Si veda, ad esempio il documento *Social Media Guidelines* di ICOM che introduce una serie di norme e strumenti a supporto della gestione dei social media di un museo inserendole nell'ambito della *Communication*, che «is generally considered to be one of the most crucial aspects of any organisation, whether it is commercial, or not-for-profit like ICOM and its Committees. However, communication is rarely the main priority, and this paradox is even more evident in relation to digital communication, and particularly to social media» (ICOM 2019, 5; lo ricordano anche Calveri, Sacco 2021, 52-3). Anche un professionista di rilievo come Silvio Salvo, Social Media Manager della Fondazione Sandretto Re Rebaudengo di Torino, affermava nel 2017 (Colombo 2020,157-63) che il senso dell'utilizzo dei canali social è «comunicare le attività e interagire con il pubblico in maniera più immediata» (Colombo 2020, 158).

13 Cf. d.lgs 22 gennaio 2004, n. 42, in materia di Codice dei beni culturali e del paesaggio, ai sensi dell'articolo 10 della legge 6 luglio 2002, n. 137, art. 6, co. 1: «La valorizzazione consiste nell'esercizio delle funzioni e nella disciplina delle attività dirette a promuovere la conoscenza del patrimonio culturale e ad assicurare le migliori condizioni di utilizzazione e fruizione pubblica del patrimonio stesso, anche da parte delle persone diversamente abili, al fine di promuovere lo sviluppo della cultura. Essa comprende anche la promozione ed il sostegno degli interventi di conservazione del patrimonio culturale».

> [n]ot only have […] increased their online activity, they have also changed what they are sending over these channels. From mere tools of communication, social media have evolved into tools for spreading knowledge. (Agostino, Araboldi, Lampis 2020, 367)

Crediamo che limitare il discorso al solo ambito della comunicazione, dunque, così come definito peraltro anche in relazione ai LUQV – Livelli Uniformi di Qualità per i musei (su cui si basa la procedura di accreditamento al Sistema Museale Nazionale), e dunque in qualche modo separato da altre mansioni del museo (educativa, di tutela, di gestione, di ricerca e così via), non permetta di descrivere adeguatamente il ruolo che questi mezzi hanno avuto durante la pandemia e che dovrebbero a nostro avviso mantenere. Ad esempio, nell'ambito educativo, il social network può essere utilizzato non già solo per informare circa un'attività didattica, ma per svolgerla totalmente o parzialmente in quella sede.

Occorre a questo punto riavvolgere il nastro e affrontare la storia dal principio.

2 Le pagine social del Museo di Palazzo Grimani prima della pandemia

Fin dalla creazione della prima pagina Facebook,[14] la comunicazione social del Museo di Palazzo Grimani pativa numerose problematiche legate alla natura stessa dell'istituto: un museo nuovo per la città di Venezia, circondato da un'abbondante offerta culturale. Il Palazzo, rimasto chiuso per molti anni e ormai sconosciuto anche alla quasi totalità dei veneziani, risentiva anche della sua posizione defilata, nel Sestiere di Castello con l'ingresso di terra al fondo di uno stretto ramo di Ruga Giuffa, oltre che della presenza ingombrante di un omonimo edificio, il cinquecentesco Palazzo Grimani del ramo di San Luca sul Canal Grande, sede della Corte d'Appello Penale di Venezia e molto indicizzato sul web. Non solo: seppur sede di numerose mostre temporanee (tra il 2010 e il 2015), il museo risultava al pubblico 'vuoto', in quanto la selezione di opere esposte (circa dieci dipinti e altrettante sculture) erano distribuite nei quasi 1.000 mq di spazi espositivi, nei quali le architetture e le decorazioni dei soffit-

14 Il museo di Palazzo Grimani fu inaugurato il 21 dicembre del 2008 dopo lunghi anni di restauro: inizialmente fu aperto con prenotazione per visite guidate programmate. Da dicembre 2010, il museo fu aperto al pubblico con accesso libero. Contestualmente alla sua inaugurazione, fu aperta dal concessionario dei servizi al pubblico la pagina Facebook ufficiale del museo, rimasta però non gestita fino al 2012, quando fu presa in mano dal personale interno. Nel 2017 fu attivato anche il profilo Instagram, fin dall'inizio gestito internamente.

ti risultavano decifrabili quasi solo da un pubblico di addetti ai lavori. Il Museo di Palazzo Grimani, insomma, somigliava più a un corpo estraneo che a un organismo inserito nel suo contesto naturale.

Il deficit conoscitivo è stato gradualmente colmato una volta acquisita pienamente la gestione della pagina Facebook e con l'apertura del profilo Instagram, con una strategia basata essenzialmente sulle immagini, poiché ci si è resi conto essere necessaria la creazione da zero di uno scenario: sono state svolte numerose campagne fotografiche per la creazione di un database di immagini accattivanti e pensate sempre per una fruizione da telefono. È stato svolto anche un lungo lavoro di ricerca degli scatti pubblicati dai visitatori sulle varie piattaforme, per capire quelli che fossero i punti di forza del museo, ma dal punto di vista dei fruitori stessi.

Nelle pubblicazioni social sono sempre state privilegiate immagini dal formato verticale o quadrato (per occupare al massimo lo schermo del telefono), foto armoniose, luminose, contemporanee, con prospettive anche bizzarre. Tutte le immagini subivano infine un passaggio su telefono, per vedere in anteprima il risultato ed evitare effetti distorsivi, ad esempio nei colori che il monitor del pc poteva creare, o sulle dimensioni di scritte o particolari troppo piccoli che su telefono potevano risultare illeggibili. Abbiamo dato particolare attenzione a immagini dinamiche e dove vi era anche presenza di persone, per rendere ancora più reali le dimensioni degli spazi e far immedesimare l'utente nella foto. Ogni pubblicazione è stata accompagnata dalla spiegazione puntuale dello scatto, con didascalie complete e aggiornate e qualche approfondimento scientifico.

Tale modalità comunicativa ha fin da subito generato ottimi feedback, potendo beneficiare innanzitutto della novità e della bellezza delle sale monumentali del museo, nonché delle operazioni espositive avviate nel 2019 con il riallestimento della Tribuna Grimani (Bergamo Rossi, Ferrara, 2021). Nonostante la crescita esponenziale dei *follower*, lo scenario comunicativo creato risultava però troppo statico e freddo, ma di sicuro è stato la necessaria base di credibilità che ci ha permesso di spingerci oltre negli ultimi tre anni.

La pandemia da COVID-19 nella città di Venezia è stata anticipata da un altro evento drammatico: l'*acqua granda* del novembre 2019. In quell'occasione il Museo di Palazzo Grimani è stato costretto a chiudere per un mese a causa degli ingenti danni subiti per le maree eccezionali. Trascinata non solo da queste, ma anche dal dato emotivo di un evento catastrofico, la comunicazione social del museo si è trasformata rapidamente, avendo come oggetto il grande impiego di energie per superare l'emergenza. Abbiamo mostrato in tempo reale come il museo si fosse rimboccato le maniche, quasi come fosse una persona fisica, per diminuire i danni e riaprire nel minor tempo possibile: l'acqua che aveva invaso cortile e stanze del piano terra, ma soprattutto il lavoro di ripristino grazie alla partecipazione nu-

merosa di volontari, accorsi grazie anche tramite le pagine social. Le immagini, molto forti, hanno fatto il giro del mondo e non solo hanno accresciuto la percezione all'esterno dell'attaccamento del personale interno al museo, ma generato una vera e propria affezione da parte dei follower.

Anche grazie a questo recentissimo bagaglio acquisito, lo scoppio della pandemia nel febbraio del 2020 ha avuto impatto su uno staff in qualche modo 'preparato' a reagire all'evento, sebbene nelle primissime settimane la sensazione prevalente fu di grande sconforto e disorientamento,[15] provocando una sorta di condizione sospesa che si è rivelata tuttavia provvidenziale, poiché ci ha costretti a riflettere senza gettarci a capofitto su soluzioni più immediate (ovvero riversare online contenuti digitali già pronti o creare in fretta e furia visite guidate virtuali),[16] come invece altri istituti istituzioni si apprestavano a fare.

3 Quali strumenti per quale pubblico

Nell'introduzione al XII rapporto Civita, Dario Franceschini ricorda come

> [s]in dai primi momenti, gli archivi, le biblioteche, i musei e gli istituti del Ministero della Cultura si sono attivati per proseguire a mantenere un contatto con i cittadini attraverso il digitale, dando vita a una impetuosa e rapida conversione che permettesse l'accesso al patrimonio culturale nonostante la situazione. […] La moltiplicazione di nuove piattaforme, la rinnovata centralità dei social, la riscoperta dei virtual tour, dei webinar, l'ideazione di nuovi

15 Una condizione comune a tutti i musei e i loro professionisti, tanto da indurre ICOM a diffondere un vademecum dal titolo *Musei e COVID-19: 8 tappe per sostenere la resilienza della comunità museale*, che conteneva anche consigli in merito alle attività digitali durante le chiusure.

16 La qual cosa ha generato spesso più criticità che opportunità, dovute anche all'enorme squilibrio di competenze digitali e web all'interno del panorama dei musei italiani: si è verificato, infatti, «un improvviso sovraccarico di contenuti digitali, non tutti di alta qualità professionale, come è prevedibile che avvenga quando l'urgenza impone di agire nell'immediato e di coprire nello spazio di ore ritardi accumulati in anni di disinteresse: di qui l'emergere evidente della qualità dei prodotti digitali da parte delle organizzazioni che avevano investito risorse importanti negli anni passati. Si sono visti migliaia di casi differenti, e non solo riguardanti le piccole strutture: si è passati dai video girati in modo amatoriale dal professionista singolo con il proprio smartphone, alla poderosa discesa in campo degli Uffizi dopo anni di sussiegosa distanza nell'aprire la pagina Facebook e nello scatenare polemiche per i video ironici e provocatori su TikTok, fino all'improvvisa messa online di materiale già disponibile in formato digitale e registrato negli anni addietro, con un effetto evidente di inflazione digitale» (Osservatorio Culturale Piemonte 2019, 15).

> format per raccontare il patrimonio culturale e le sue professioni è stata impressionante, dimostrando la capacità di reazione degli istituti. (Franceschini 2021, pos. 57)

L'allora Ministro della Cultura individua nel 'ricorso al digitale' l'elemento peculiare del lavoro di molti istituti di cultura durante la fase pandemica, con una marcata connotazione di 'conquista' che ha fatto emergere *impetuosamente* e *rapidamente* i musei italiani da una condizione di sostanziale immaturità. Ciò è nel complesso corretto, ma, entrando più nello specifico, crediamo si debba considerare l'utilizzo di strumenti, ambienti e materiali digitali piuttosto come una precondizione[17] per l'attivazione di processi che hanno avuto, e probabilmente stanno ancora avendo, un portato molto più profondo e strutturale del mero utilizzo – talvolta fine a sé stesso – di visite virtuali o piattaforme di condivisione, un portato che riguarda il modo stesso di pensare il museo nel suo contesto e verso i suoi interlocutori. Il fattore discriminante in questa contingenza è stata appunto la possibilità data dal web, e in particolare dai social media, di continuare a operare in remoto ai fini della valorizzazione (Colombo 2020, 214) restando connessi alle comunità di riferimento e garantendo una presenza fattiva seppur nella virtualità dello spazio di una pagina Facebook o di un profilo Instagram.

Il che potrebbe sembrare un paradosso e in fin dei conti lo è stato: dopo aver per anni ripetuto che il digitale non può sostituire la visione diretta dell'opera d'arte e la frequentazione in presenza dei musei, e dunque ragionato, noi per primi, al fine di trovare il giusto equilibrio tra le due dimensioni, privilegiando comunque sempre la seconda, ci siamo ritrovati ad apprendere molto di più su noi stessi e sul nostro modo di relazionarci col pubblico nel momento in cui qualsiasi tipo di rapporto 'analogico' è venuto meno. La pandemia ha infatti accelerato esponenzialmente il processo di integrazione degli strumenti socio-digitali nella progettazione culturale di molti istituti, in un qualche modo 'normalizzandone' l'utilizzo soprattutto in relazione all'esigenza, ancora fortemente avvertita, di abbattere le barriere[18] tra i musei e ciò che sta al di fuori di essi: non solo, come

17 L'uso di strumenti, ambienti, materiali digitali non era tuttavia una novità per i musei italiani (Osservatorio Innovazione Digitale nei Beni e Attività Culturali del Politecnico di Milano 2019): una larga maggioranza di musei (e non solo quelli di grandi dimensioni) non ha 'scoperto' tali tecnologie solo nel marzo 2020, le conosceva e le utilizzava già in diversi ambiti, magari con differenze anche ampie sia sul piano qualitativo che quantitativo dipendenti sia dalla disponibilità di risorse economiche e professionali, che dall'importanza che a esse si conferiva all'interno della gestione di ciascun istituto. Le sollecitazioni in questo senso giungevano anche da parte ministeriale (Orsini, Lampis 2019). Per quanto riguarda i social network si veda anche Mannucci, Sciucchini 2016.

18 D'altra parte quello di «abbattere in maniera repentina e assoluta la barriera tra creatori e pubblico» è un effetto ontologicamente connesso alle tecnologie digitali in

già realizzato anche prima della pandemia, perché questi permettono al pubblico di partecipare in prima persona alle attività museali anche in un'ottica di creazione condivisa, secondo una direttrice 'da fuori a dentro',[19] ma perché hanno finalmente rivelato che è possibile, per molti istituti, uscire dalle proprie mura e andare incontro ai propri interlocutori, secondo una direttrice 'da dentro a fuori'. Fatto, questo, assolutamente non scontato soprattutto nel contesto nazionale italiano e per musei che vivono una condizione di 'disconnessione' rispetto al proprio territorio e nei confronti della contemporaneità, com'era appunto il Museo di Palazzo Grimani. Utilizzeremo dunque, più correttamente, l'aggettivo socio-digitale per definire gli strumenti e le prospettive di lavoro adottati durante la pandemia.

Ne deriva un'ulteriore considerazione connessa alla seguente domanda: il museo che esce al di fuori dei propri confini chi incontra nel suo percorso? La questione non è banale, perché prima della pandemia si continuava a ritenere necessario orientare la produzione di contenuti per i social secondo classi di fruitori precisamente individuate, dunque operando una selezione a priori a seconda delle esigenze del singolo istituto (Mandarano 2019). Già da tempo l'utilizzo dei social media permetteva a quei musei che avevano compreso come sfruttarli ai fini dell'*audience engagement* di ampliare comunque il bacino di utenza potenziale soprattutto verso le generazioni under 35, tuttavia ciò che è avvenuto dal marzo 2020 (e soprattutto nelle prime settimane di lockdown) va oltre questa dinamica.

Lo spiega bene Solima (2022, 175), sottolineando come i social media posseggano caratteristiche tali[20] da portarli ad «avere un pubblico indistinto, dato che l'utente che genera un contenuto digitale non può determinare facilmente a quale insieme di utenti, anche in altre piattaforme, il contenuto potrà essere veicolato» sebbene certamente «il creatore di contenuti può determinare con elevata precisione a quale pubblico (chi) rivolgersi inizialmente». Utenti, dunque, non più solo visitatori (145): si tratta, continua sempre Solima di «tutti

ogni ambito della cultura (e non solo, con tutti i limiti del caso), grazie alle quali tecnologie «oggi chiunque lo voglia è in grado di produrre contenuti, e dunque la produzione non avviene più con logiche gerarchiche come quelle in uso, ad esempio, nel Settecento e nell'Ottocento [...]». Una rivoluzione, questa, di cui ancora non comprendiamo appieno le potenzialità, ma che, nei fatti, è già operativa poiché «la gente si sta abituando a queste forme di partecipazione [alcune generazioni lo sono certamente del tutto, n.d.a.], e questa è un'ottima cosa» (Calveri, Sacco 2021, 20-1).

19 Ragionano in questa prospettiva anche Calveri e Sacco, come poco sopra ricordato, sebbene il loro discorso si riferisca all'ambito della cultura in generale e non specificatamente al mondo dei musei. Per questo, comunque, si fa riferimento, quando si parla di museo partecipativo, in effetti più alle modalità con le quali sono i fruitori a partecipare alla vita dell'istituto, come se il punto di vista fosse univoco.

20 Nell'essere, infatti, i loro contenuti «persistenti», «ricercabili» e «replicabili» (Solima 2022, 175).

coloro che sono comunque interessati a stabilire un rapporto con il museo che prescinde dalla loro presenza fisica» (Solima 2020, 188) perché lontani geograficamente o senza disponibilità di sufficiente tempo, ma anche, potenzialmente, tutti coloro che anche inavvertitamente entrano in relazione (tramite le 'imperscrutabili' vie dell'algoritmo) con uno dei suoi contenuti socio-digitali.[21] Sostanzialmente con tutti coloro che hanno accesso a un social network tra quelli in cui l'istituto è presente.

Si tratta di un cambio di prospettiva ricco di possibilità non solo in termini di *audience developement* in presenza (vedremo quanto ha inciso per il Museo di Palazzo Grimani), ma per il modo con il quale si lega, appunto, a quanto dicevamo poco sopra in merito all'apertura dei musei verso l'esterno: non più unicamente, dunque, l'istituto che genera contenuti per destinatari eletti, che questo cioè individua sulla base delle caratteristiche intrinseche del proprio patrimonio artistico, archeologico, architettonico e così via, in modo da stimolarne, di contro, la partecipazione; ma il museo che prova a intercettare i bisogni di un'utenza ampia ed eterogenea, bisogni anche lontani dalle proprie prerogative e dalle consuete mansioni, ai quali prova a rispondere con nuovi contenuti e nuovi strumenti. Vediamo, dunque, come questa situazione si è verificata in relazione al Museo di Palazzo Grimani fin dalle prime settimane di pandemia.

4 A tu per tu con la pandemia: tra primo e secondo lockdown

Dopo una prima fase di incertezza,[22] una volta chiaro che la condizione di chiusura al pubblico sarebbe perdurata per un tempo non quantificabile e comunque non breve, abbiamo valutato di investire questo tempo 'sospeso' in nuovi progetti da condividere sulle pagine e sui profili social, nonostante avessimo già a disposizione degli strumenti in realtà virtuale[23] e materiali multimediali da ricondividere. Ci sembrava infatti poco efficace ai fini del coinvolgimento del pubblico, nonché incoerente rispetto al fatto che il museo continuava a tutti gli effetti a essere operativo,[24] riproporre contenuti già vi-

21 Sull'utilizzo delle risorse web da parte dell'utenza in Italia durante la pandemia si veda Cicerchia, Solima 2021.

22 A cavallo tra febbraio e marzo 2020 il museo è stato chiuso per una settimana, per poi essere riaperto per alcuni giorni, per poi chiudere nuovamente a seguito del lockdown nazionale.

23 In particolare una visita virtuale del palazzo realizzata da ItalyArt nel 2019 (accessibile al link: `https://www.italyart.it/site/reg/site/palazzo-grimani.php?r=`).

24 Questo grazie al fatto che, essendo il Museo di Palazzo Grimani un istituto statale, il personale non ha subito limitazioni all'attività lavorativa come invece accaduto a isti-

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sti. Soprattutto, abbiamo fin dal principio adottato una metodologia di lavoro che non mirava a trasporre nel social media ciò che fino a poche settimane prima avveniva in presenza, effettuando una mera 'traduzione' dall'analogico al digitale (la visita guidata che diventa video di approfondimento su un'opera o su un contesto monumentale con l'esperto che spiega accanto alla vetrina o anche la stessa visita svolta a distanza con una diretta), una scelta che si è rivelata estremamente efficace nel medio periodo. Era necessario dunque individuare una prospettiva attraverso la quale condurre quella che, fin da subito, ci è parsa un'importante occasione di sperimentazione.

Abbiamo dunque cercato di leggere la situazione interpretando a tutto tondo il sostantivo greco καταστροφή (*katastrophé*) ovvero 'capovolgimento, ribaltamento, stravolgimento', stravolgendo quindi la comunicazione social del museo, ribaltando l'oggetto comunicativo incentrandolo sull'interpretazione dei bisogni dei nostri follower o potenziali tali (con particolare attenzione all'emotività del momento storico che stavamo vivendo),[25] capovolgendo l'approccio al nostro stesso patrimonio artistico da continuare a valorizzare, andando a selezionare punti di vista insoliti e nascosti.[26]

Così, durante il primo lockdown (più precisamente dalla metà di marzo alla metà di giugno 2020), la comunicazione del museo ha virato verso un *tone of voice* rassicurante ed evocativo, grazie alla creazione *ad hoc* di contenuti originali che rendessero visibile ciò che durante una visita ordinaria in presenza non era possibile cogliere. Il progetto, dal titolo *#Grimaniacasa*, giocava con le parole sulla scia della neonata campagna governativa di sensibilizzazione *#iorestoacasa*. Fu realizzata una serie di video della durata di massimo tre minuti e raggruppati in una playlist, nella quale l'oggetto primario della comunicazione non era l'opera in sé, ma l'emozione che la stes-

tuti privati o para-pubblici (come la Fondazione Musei Civici di Venezia, il cui personale tecnico-scientifico è stato posto in disoccupazione per molte settimane).

25 Riconoscendo in maniera subitanea quanto, durante la chiusura, «la scelta di accedere [da remoto, n.d.a.] a un luogo come il museo, nasce dalla necessità di soddisfare dei bisogni emotivi personali e unici, non sempre individuabili dalle indagini, perché generati da una situazione esistenziale particolare e personale» (Biondi 2021, 122).

26 È interessante ricordare che un simile approccio ha caratterizzato anche le iniziative social proposte da altri musei statali nel medesimo momento. Così, ad esempio, per i Musei Reali di Torino che «[p]er sentir[si] meno soli, e per farvi sentire meno soli nelle vostre case, [hanno] pensato di far uscire allo scoperto tutte quelle cose che di solito stanno chiuse, dietro a una porta riservata, dentro agli armadi o nei cassetti, dentro ai depositi» (`https://museireali.beniculturali.it/events/closed-in-i-musei-visti-da-dentro/`), attraverso il progetto *Closed In. I Musei visti da dentro*, svoltosi nei mesi di aprile e agosto 2020 sul Instagram e Youtube. Ancora, Castel del Monte, afferente alla Direzione regionale Musei Puglia, ha pubblicato sulla pagine Facebook (@CastelDelMonte.PoloMusealePuglia) durante il primo lockdown una serie di video con cui permetteva di scoprire spazi del castello altrimenti non accessibili al pubblico, nemmeno durante l'ordinaria apertura.

sa poteva suscitare nel fruitore. Questi veniva invitato a immergersi nel video, lasciandosi trasportare dalle immagini, dai suoni e da musiche evocative. In alcuni casi abbiamo scelto di accompagnare le immagini anche con una voce narrante, che, tuttavia, non andava meramente a descriverle, ma a *completarle* con citazioni letterarie o descrizioni avvincenti, con un tono della voce caldo e rassicurante.[27]

Tale approccio innovativo (quantomeno per le nostre pagine social) è stato colto sia dall'utenza che dalla stampa locale, la quale ha dato ampio spazio alle iniziative digitali del museo durante tutto il primo lockdown.[28] I risultati online ottenuti nella primavera del 2020, come il forte aumento dei follower sia su Facebook sia su Instagram, ma soprattutto l'elevato *engagement* prodotto (con singoli post che hanno raggiunto anche le 10.000 interazioni totali), hanno poi generato una importante risposta di pubblico in presenza nel periodo estivo,[29] sia in termini quantitativi (ovviamente parametrati alla disponibilità di spostamento delle persone nel territorio nazionale)[30] che qualitativi, in relazione all'affezione che i visitatori mostravano avere nei confronti del museo fin dal primo giorno di riapertura.[31] Ovviamente si trattava prevalentemente di persone veneziane o venete e anche di molti giovani, come appurato da un piccolo sondaggio condotto nel periodo autunnale,[32] una novità per il Museo di Palazzo Grimani che, come si diceva, poteva contare fino a quel momento su un'*audience* di nicchia, in gran parte straniera (francese, soprattutto), di cultura medio-alta e di età matura.

Tale evoluzione antropologica dei visitatori e la perdurante quasi completa assenza di turisti, così come il sentimento generale che

27 I 10 video realizzati (Laocoonte, La Tribuna, Leda e il Cigno, La Sala a Fogliami, Antinoo, La disputa tra Atena e Poseidone, Palazzo Grimani 1959-1968, Atena, Il Camerino di Apollo, Ganimede) sono stati pubblicati come post su Facebook e come video e storie su Instagram, sono stati caricati sul canale Youtube della Direzione regionale Musei del Veneto e, successivamente, raggruppati in playlist sulle piattaforme social per facilitarne la ricerca e la visione.

28 *Corriere del Veneto*, 7 aprile 2020; *La Nuova Venezia*, 3 aprile 2020.

29 Il Museo di Palazzo Grimani ha riaperto al pubblico il 26 giugno del 2020.

30 Oltre 10.000 visitatori nei tre mesi di luglio-agosto-settembre 2020, nonostante l'apertura su tre giorni anziché sei, alternando aperture infrasettimanali ai weekend.

31 *Corriere del Veneto*, 27 giugno 2020; *La Nuova Venezia*, 27 giugno 2021.

32 Purtroppo l'impossibilità, per ragioni di sicurezza, di utilizzare questionari cartacei, la mancanza di adeguata strumentazione digitale e l'esiguità di organico non ci hanno consentito di svolgere una campagna di rilevazione continuativa e di massa, che pure avevamo programmato di effettuare nel mese di novembre, salvo poi dover retrocedere dall'intento a causa delle nuove chiusure. Abbiamo quindi predisposto due questionari telematici che abbiamo diffuso tramite le pagine social e la newsletter, chiedendo a tutti coloro che avessero visitato il museo tra giugno e ottobre 2020 di compilarlo. I risultati (i questionari compilati sono stati in totale 80) hanno confermato le nostre prime impressioni: la maggioranza dei visitatori proveniva da Venezia, o al massimo dalle città venete; molti conoscevano e avevano già visitato il museo ma una quota considerevole lo ha visitato per la prima volta; la maggioranza seguiva le pagine social.

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andava affermandosi nell'opinione pubblica, hanno inciso fortemente sulla progettazione della programmazione social del secondo lockdown, tra l'autunno 2020 e l'inverno 2021.[33] Questa nuova fase di chiusura si è prospettata fin da subito molto diversa dalla prima, soprattutto per quanto riguarda la risposta della cittadinanza agli eventi pandemici: il fortissimo aumento dei contagi e il rinnovo di limitanti misure di prevenzione e contenimento hanno provocato una reazione diametralmente opposta al lockdown della primavera 2020, caratterizzata da un forte senso di scoraggiamento e delusione per una situazione che si sperava sostanzialmente superata (a fronte, in principio, di un bisogno di comunione e di speranza testimoniato dallo slogan 'andrà tutto bene'). In tale circostanza, dunque, il rinnovato rischio di sembrare in qualche modo 'privi di vita', come ci si aspetterebbe da un'istituzione culturale chiusa al pubblico per la seconda volta in pochi mesi, è stato scongiurato agendo sulla percezione che del museo si voleva indurre nell'utenza: non un corpo immobile ma un fenomeno fortemente reagente con l'esterno. Un essere vivente, attento a cogliere e rispondere alle sollecitazioni provenienti dal mondo, in particolare le trasformazioni che stavano avvenendo nella città di Venezia, dominata fino a quel momento dalla monocultura turistica, e con le quali eravamo in qualche modo costretti a confrontarci. Riportiamo alcuni esempi che aiutano a comprendere questa dinamica, selezionati tra i post che hanno raggiunto il più alto numero di interazioni.

Coerentemente con la metodologia già positivamente sperimentata durante il primo lockdown, abbiamo innanzitutto cercato di interpretare nuovamente gli umori dell'utenza e rispondere a questi attraverso le narrazioni che il nostro patrimonio custodito poteva riservare. Il *tone of voice*, dunque, è passato dal rassicurante all'ironico, volendo offrire momenti di 'riflessione scherzosa' che potessero, perché no, anche solo divertire i fruitori, alleggerendo un momento molto pesante per il morale collettivo, compreso il nostro. È nata così, in primo luogo, la campagna *#Sorrisiforzati*, condotta nei mesi di novembre e dicembre 2020. Applicando un filtro fotografico di semplice utilizzo, abbiamo realizzato una piccola rassegna di immagini, nelle quali mostravamo la reazione delle nostre opere alla nuova chiusura forzata del museo: un sorriso dissacrante accompagnava la carrellata di personaggi dipinti e scolpiti, dal doge Antonio Grimani all'imperatore Adriano, dal Patriarca d'Aquileia Giovanni Grimani **[fig. 1]** agli dei dell'Olimpo, stravolgendo la percezione delle opere attraverso il paradosso: perché i personaggi ritratti non avevano alcuna ragione per sorridere, in quel preciso frangente, e perché para-

33 Il Museo di Palazzo Grimani ha chiuso il 5 novembre 2020 per riaprire il 3 febbraio 2021 per sole tre settimane.

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dossale era la chiusura forzata di un servizio pubblico ritenuto, per legge, essenziale, nel quale erano adottati protocolli più che stringenti (ad esempio la capienza del palazzo calibrata su 30 mq/visitatore).

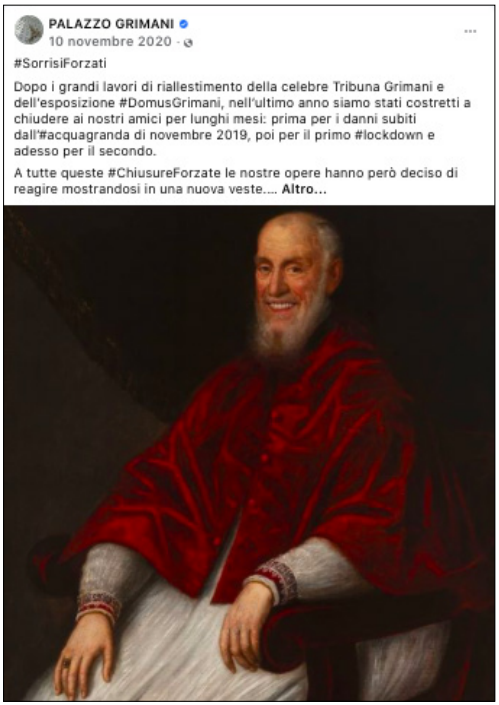

Figura 1
Esempio di post della campagna social #sorrisiforzati, pagina Facebook 'PALAZZO GRIMANI'. Il dipinto è di D. Tintoretto, Ritratto di Giovanni Grimani, olio su tela, XVI-XVII secolo, Museo di Palazzo Grimani, Venezia

Tale scelta retorica ha generato un'interessante risposta da parte degli utenti delle pagine social che hanno mostrato di apprezzare l'utilizzo del registro sarcastico, cogliendone l'intento iniziale, senza percepire alcuna contraddizione rispetto ai contenuti storico-artistici che andava a connotare. Questo ci ha spinto a proseguire su questa strada e a compiere un ulteriore passo avanti, volgendo tale sguardo ironico anche al contesto urbano di riferimento anch'esso oggetto di paradossali metamorfosi, a cui abbiamo accennato poco sopra, talvolta in maniera più pungente, altre volte con tono garbato e quasi affettuoso. Riportiamo, a titolo di esempio, due post pubblicati nel dicembre 2020.

Il primo riguarda un acceso dibattito che ha coinvolto l'opinione pubblica cittadina nel periodo natalizio. Il Comune di Venezia, con accordi antecedenti lo scoppio della pandemia, aveva infatti pensato di sostituire il tradizionale albero di Natale di Piazzetta San Marco con un'installazione dell'artista Fabrizio Plessi. Già durante le fasi di montaggio dei monitor che andavano a comporre la videoinstalla-

zione, in città è scoppiata la polemica: non tanto per la scelta in sé, ma perché ritenuta incoerente col momento storico che si stava vivendo. In una città vuota, senza presenze straniere per il secondo inverno consecutivo e con interi settori economici in fortissima crisi, la scelta 'tecnologica' fin da subito è sembrata rivolta a un pubblico in realtà assente, ovvero i turisti. Nei social di Palazzo Grimani abbiamo cercato, con l'ironia della comicità paradossale,[34] di placare sul nascere il malcontento generale spiegando che l'albero di Plessi non solo esisteva in natura, ma la specie era stata rappresentata già nel Cinquecento nell'affresco del soffitto della celebre Sala a Fogliami del museo **[fig. 2]**.

Figura 2
Post sull'albero di Natale di F. Plessi, pagina Facebook 'PALAZZO GRIMANI'

34 Precursore in questo senso, è stato il social media manager della fondazione Sandretto Re Rebaudengo di Torino, Silvio Salvo. Si rimanda all'intervista di Maria Elena Colombo per ArtTribune, pubblicata anche in Colombo 2020, 157-63.

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Il secondo esempio si riferisce al post che ancora oggi costituisce un record per numero di like alla singola pubblicazione.[35] La prolungata assenza del turismo di massa durante i mesi di lockdown ha avuto a Venezia conseguenze inattese e apprezzabili dal punto di vista ambientale. La drastica diminuzione dei rifiuti, degli scarichi fognari e della circolazione delle migliaia di imbarcazioni dell'indotto turistico ha fatto sì che i canali assumessero colorazioni di cui si era persa memoria, con i fondali visibili grazie alla limpidezza dell'acqua, e soprattutto che si ripopolassero di fauna acquatica che poteva nuotare quasi indisturbata. Durante i mesi di chiusura del museo, infatti, lungo il Rio di San Severo (adiacente alla facciata principale del Palazzo sull'acqua) non era infrequente vedere intere famiglie di germani reali e altri volatili al posto delle barche o delle gondole ormai riservate solo all'uso *foresto*. Così, ironicamente, abbiamo utilizzato una fotografia scattata proprio di fronte a Palazzo Grimani per rassicurare i nostri interlocutori sul fatto che la città non avesse smesso di essere frequentata, scherzando sul concetto di turismo migratorio, nell'attesa che questi potessero tornare a visitarci e, al tempo stesso, per mostrare quanto il museo fosse attento a ciò che avveniva al di fuori di esso e non già ripiegato su sé stesso e sulla sua chiusura al mondo esterno **[figg. 3-6]**.

Assieme alle altre decine di post pubblicati in quel periodo,[36] in cui l'approccio ironico si alternava a proposte più evocative e a contenuti scientifici e di approfondimento, l'azione socio-digitale del Museo di Palazzo Grimani ha garantito una percepibile centralità dell'istituto nel panorama cittadino, non solo come uno degli organi dell'organismo complesso che è la città di Venezia, ma come uno dei più vitali e quasi necessario alla sua sopravvivenza come ecosistema culturale.[37] Ancora una volta, alla riapertura (purtroppo temporanea) del febbraio 2021 abbiamo potuto raccogliere i frutti di questo lavoro per quanto riguarda il rapporto tra fruizione in remoto e visita in presenza,

35 Ovvero 8.498 like, 761 condivisioni, 141 commenti e un pubblico raggiunto superiore ai 310.000 utenti al 5 settembre 2022.

36 A titolo esemplificativo, si riportano alcuni esempi in foto **[figg. 8-10]**.

37 L'esigenza di riscoprire il legame con il proprio territorio è uno degli elementi caratteristici dell'esperienza non solo del Museo di Palazzo Grimani, ma anche di altri soggetti, come la Direzione regionale Musei Toscana, che fin dalla primavera 2020 ha proposto un progetto che coinvolgeva tutti gli istituti a essa afferenti, dal titolo *Il giro della Toscana in 49 musei*, che consisteva in tappe numerate con video anche molto diversi tra loro, come riprese a effetto con sottofondo musicale o spiegazioni di opere d'arte. Tale esigenza ha, appunto, un carattere ricorsivo: era stata chiaramente inquadrata già negli anni Settanta del Novecento dalla *Nouvelle Muséologie* e dalle sue declinazioni: le connessioni di senso e di metodo delle esperienza dei musei durante la pandemia con questo capitale approccio alla teoria e alla pratica museale, in particolare nel richiamare il 'ruolo sociale' del museo, sono state chiaramente delineate in un recente contributo di Antonietta Biondi (2021).

con più di 500 visitatori in due settimane col Museo aperto solo parzialmente per restauri nelle sale dell'ala antica, in vista del riallestimento della Sala del Doge e il ripristino delle dimensioni della Sala di Psiche, sale che sarebbero state inaugurate nel maggio successivo nell'ambito dell'operazione espositiva *Domus Grimani. La Sala del Doge*, unitamente alla mostra *Archinto* di Georg Baselitz, tutt'ora in corso. La chiusura al pubblico della primavera 2021 è dunque coincisa con importanti cantieri che hanno orientato fortemente i contenuti social con anticipazioni sulle nuove sale e sulla scoperta di un bassorilievo con una *Salamandra tra le fiamme* ritrovato fortuitamente all'interno di una parete durante i lavori **[fig. 7]**.

Figure 3-4 Post sulla famiglia di volatili davanti alla facciata di Palazzo Grimani; Esempio di post dedicato allo sguardo sullo spazio urban. Pagina Facebook 'PALAZZO GRIMANI'

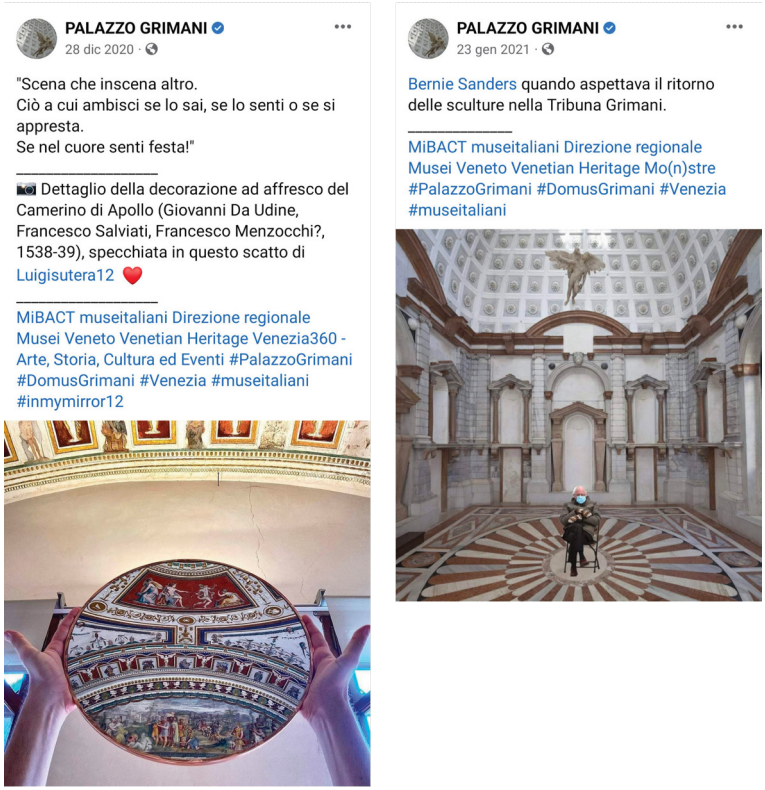

Figure 5-6 Esempio di post evocativo; esempio di post ironico dedicato a eventi salienti internazionali. Pagina Facebook 'PALAZZO GRIMANI'

L'esperienza del secondo lockdown ha inciso fortemente nell'elaborazione di un nuova metodologia d'uso delle pagine social – e non solo – anche in una situazione di 'normalità' post-COVID, da una parte facendo dell'ironia e della dissacrazione uno dei tratti caratteristici del Museo di Palazzo Grimani su Facebook e Instagram (riconosciuto dall'utenza in quanto tale), anche attraverso l'utilizzo massivo di *meme,* sempre in funzione di un obiettivo comunicativo o di valorizzazione legato al museo stesso;[38] dall'altra parte rendendoci piena-

38 Nel 2021 l'Italia ha ospitato alcuni summit del G20. Una tappa fu anche Venezia, dove il 9 e 10 luglio si riunirono sia i Ministri delle Finanze e Governatori delle Banche Centrali, sia i Ministri dell'Ambiente. In piena ripresa turistica, Venezia fu blindata e, per pochi metri, il Museo di Palazzo Grimani non fu costretto chiudere per motivi di sicurezza, come avvenne ad altri istituti di cultura. Per comunicare l'ordinaria apertura scegliemmo di realizzare un fotomontaggio, sfruttando lo scatto già diventato iconi-

mente consapevoli dell'importanza di mantenere costante il legame con uno spazio di riferimento, inteso sia come organismo urbano nelle sue componenti fisiche e monumentali che in termini socio culturali (il patrimonio di esperienze, tradizioni, opinioni che lo caratterizza), nonché della necessità per il museo di rimanere ancorato, quasi 'immerso' nel proprio tempo, inteso qui non tanto nella sua componente diacronica, quanto nel suo valore sincronico.

Figura 7
Post sulla scoperta della Salamandra tra le fiamme. Pagina Facebook 'PALAZZO GRIMANI'

co della settimana precedente: nella tappa del G20 a Matera, infatti, un professore in pensione si affacciò inconsapevolmente a petto nudo dal suo balcone, proprio nel momento in cui sotto di lui sfilavano i Ministri degli Esteri e dello Sviluppo. Ironicamente abbiamo quindi ribadito che la presenza del G20 a Venezia non avrebbe modificato gli orari del museo, tanto quanto il G20 a Matera non modificò le abitudini di Nicola Frangione, il professore nudo affacciato al balcone.

5 Spazio e tempo per una nuova forma di Museo

Dobbiamo allo storico dell'arte Sergio Bettini una significativa definizione delle categorie di spazio e tempo, che egli riprese dalla trattazione filosofica (da Kant a Husserl, passando per il pensiero strutturalista) per definire il concetto di 'forma' dell'opera d'arte e che crediamo possano assisterci adeguatamente nel tentativo di ricondurre tali categorie alla definizione di una rinnovata forma per il nostro Istituto e per il museo come organismo complesso, che tragga cioè dalla dimensione socio-digitale il più ampio beneficio (Calveri, Sacco 2021, 34). Bettini (1953, XII-III) afferma:

> La *forma* è l'intuibilità (determinazione) della sintesi dialettica di spazio e tempo. Lo spazio è l'essere, il dato, il mondo, insomma l'oggetto; il tempo è il non essere (il passato non c'è più, il futuro non c'è ancora, il presente è inobbiettivabile, perché se lo si obbiettiva è passato): è l'esistere: è, in una parola, il soggetto. È perciò che il tempo non è rappresentabile (quando si crede di farlo, lo si obbiettiva, lo si riduce ad evento, cioè lo si traduce in termini spaziali). […] Nel battere del tempo si raccolgono non solo la coscienza immediata di esistere o il senso della durata o le emergenze o le intermittenze della memoria, ma soprattutto quel che si dice il sentimento, con le sue sfumature incomparabili, irripetibili: serenità o angoscia, amore o repulsione, ebbrezza, speranza, timore: questo è il tempo, che è sempre di ciascun di noi e non può essere di nessun altro. Mentre lo spazio (il mondo) è di tutti, ognuno ha, anzi è, il proprio tempo. (Corsivo nell'originale)

Attualizzando dunque i concetti bettiniani, vediamo come, nel giungere a concepire sé stesso in senso spaziale, ovvero come 'oggetto' (nelle sue componenti materiali e immateriali) e come 'entità territoriale' (dentro Venezia, ma non solo), il Museo di Palazzo Grimani sia tornato ad appartenere anche fisicamente, quasi carnalmente, al mondo che lo circonda e ai suoi abitanti, riconquistando un proprio posto all'interno dell'ecosistema-città, paradossalmente nel momento di maggiore chiusura rispetto a questo.[39] Tornando a 'essere' nel contesto, il museo acquista un grado di sempre maggiore riconoscibilità, poiché finalmente 'si vede'. Non si creda che questa piccola conquista sia cosa da poco, poiché ha innescato non solo, molto ba-

39 In questo smentendo in un certo qual modo che attraverso i social media i musei «hanno potuto […] favorire la costruzione di una comunità i cui elementi forti sono la 'non spazialità', affidandosi esclusivamente a un luogo virtuale, e l'immediatezza della comunicazione» (De Biase, Valentino 2016). L'esperienza condotta durante la pandemia ha dimostrato che la virtualità non annulla affatto il concetto di spazio, anzi contribuisce a definirlo nell'assenza, poiché ne è complemento.

nalmente, un circuito virtuoso che sta facendo emergere il Palazzo da una condizione di invisibilità fisica[40] e iconografica, ma progetti strutturali e continuativi con il territorio di riferimento, che coinvolgono anche la dimensione 'analogica'.[41]

I lockdown hanno inoltre costretto non solo il Museo di Palazzo Grimani a confrontarsi con un fatto evidente: che per la prima volta ci si è trovati a condividere la medesima condizione 'esistenziale' dei nostri interlocutori, da cui è scaturita la necessità non solo di gettare un ponte verso l'esterno ma di sentirsi quotidianamente parte di un processo collettivo, che si sviluppava prevalentemente nel contesto dei social media.[42] Rispondendo a tale esigenza, il Museo ha conquistato la cognizione di esistere in quanto 'soggetto', ovvero organismo vitale e in grado di interagire nel contesto sociale con i mezzi che gli erano propri in quel preciso momento, mostrandosi attivo e, come abbiamo avuto modo di descrivere, cercando di incontrare i bisogni dell'utenza remota: il 'tempo' del Museo ha coinciso con quello non solo del suo pubblico di riferimento, ma dell'intera collettività.[43] Non solo: come afferma Biondi (2021, 128), «[d]ocumentare ed esporre la crisi in atto[44] non è solo servito a creare una memoria storica, ma ha significato mettere in grado le persone di comprenderla ed elaborarla».

I risultati di un simile approccio non hanno tardato a giungere, non solo in termini quantitativi (anche in presenza, una volta riaperto al pubblico), ma soprattutto in relazione alla cosiddetta *sentiment analysis*: si è generata negli interlocutori un'affezione nuova rispet-

40 Acuita dalla mancanza di adeguata segnaletica stradale.

41 Ci riferiamo nella fattispecie al protocollo di intesa siglato dal Museo con il Convento di San Francesco della Vigna e l'Associazione San Francesco della Vigna finalizzato a una collaborazione pluriennale per la valorizzazione del patrimonio immateriale del territorio di riferimento, a cui i tre attori sono in vario modo connessi.

42 Tale fenomeno è stato in parte 'guidato' dall'alto, con le campagne social #iorestoacasa o, per quanto concerne strettamente il mondo della cultura, #laculturanonsiferma, ma noi crediamo, per l'esperienza che abbiamo vissuto in prima persona, che sia emerso in maniera del tutto fisiologica fin dalle primissime fasi del lockdown di marzo 2020. Non a caso, un istituto come la Pinacoteca di Brera ha concepito, per questa prima fase della pandemia, un progetto social dal titolo *Appunti per una resistenza culturale*, una serie di video sul sito del Museo e condivisi sulle pagine social dedicati ad approfondimenti su opere d'arte e tematiche della collezione; il progetto si è poi perfezionato (fino a dicembre 2021), nel palinsesto digitale *Brera on Air* (`https://pinacotecabrera.org/brera-media/`).

43 Se infatti era corretto affermare, prima della pandemia, che «chi non comunica non esiste» (Dal Maso 2018, 16; vedi anche Bonacini 2020, 214) ora dovremmo piuttosto dire che la condizione di esistenza si determina in relazione all'azione nello spazio/tempo del museo.

44 Nel nostro caso documentando le trasformazioni urbane e la nuova quotidianità del museo, ma c'è chi ha inserito questa memoria, anche oggettuale, in un vero e proprio sistema espositivo in remoto (Biondi 2021, 128).

to al passato, quella (per usare un'espressione banale, ma efficace) che può darsi tra due amici. Un esito, questo, quasi insperato per un istituto del contesto italiano, dove ancora era (e forse è) radicata una concezione di museo ottocentesco quasi avulso dalla realtà che lo circonda (sebbene per moltissimi istituti non sia così, ma qui parliamo di 'percezione').

La pandemia, dunque, ha reso evidente e palpabile come il Museo di Palazzo Grimani abbia avuto nei mezzi socio-digitali uno strumento efficacissimo per costruirsi un proprio *timing*,[45] ovvero per ricrearsi costantemente nel rapporto con la società e con i suoi accadimenti in una dimensione di 'condivisione', con un'immediatezza impossibile nel contesto analogico, e così facendo iniziando a essere riconosciuto progressivamente (e finalmente!) parte di quella società esattamente come lo sono altri attori sociali:[46] è questa dinamica, a nostro avviso, che spiega il successo (durante e dopo i lockdown) dell'utilizzo di *meme* che giocano in relazione a situazioni condivise o a fatti noti e recenti. L'utilizzo dei mezzi relazionali con cui oggi, dopo esservi state in qualche modo costrette dal lockdown, la maggior parte delle persone entra in contatto, volenti o nolenti, nella distanza (dunque concludendo quel processo di 'normalizzazione' di cui si diceva poco sopra) dimostra forse l'efficacia dei social media al fine di un ripensamento globale della posizione dei musei nella società e dunque non va affatto demonizzato, né tanto meno concepito come un 'dovere della contemporaneità', del quale si potrebbe anche fare a meno, o ancora come uno strumento informativo tra i tanti.

Se in questa fenomenologia, dunque, la dimensione social/pandemia ha avuto indubbiamente un ruolo fondamentale di innesco, di miccia, non è certo a questo che la presa di coscienza di un nuovo spazio/tempo museale deve limitarsi, ma invero permeare tutta l'attività di progettazione culturale nel medio e lungo periodo. È stato già da più parti riconosciuto come molte delle nuove acquisizioni forzatamente introdotte durante il lockdown non debbano essere accantonate e dimenticate in un sempre più concreto ritorno alla normalità, ma questo assunto non può limitarsi solamente a sollecitare una pur imprescindibile infrastrutturazione digitale degli istituti o a organizzare attività estemporanee come l'utilizzo di realtà virtuale e aumentata dentro e fuori il museo o l'organizzazione di eventi in modalità 'ibrida', tanto per fare alcuni esempi. Le variegate forme del digitale, al contrario, devono essere pienamente ricomprese nelle trame – gli strumenti, le metodologie – che intessono il patrimonio

45 Per usare un'altra efficace espressione di Bettini (1958; 1972).

46 Non è più in forse dunque l'esistenza del Museo come «istituzione al servizio della società, in relazione con la comunità, locale e globale, e [...] proprio in questa relazione risiede la sua ragion d'essere» (Colombo 2020, 225).

museale nei suoi orditi – gli oggetti e le sue narrazioni – che, solo se attraversati da altri fili, possono farsi tessuto.

6 I mezzi socio-digitali nella progettazione museale presente e futura

Siamo solo al principio di questo nuovo percorso e dobbiamo augurarci che tutte le esperienze condotte e le riflessioni da queste scaturite mantengano solidità e si trasformino in orientamenti metodologici condivisi e riconosciuti validi. Da parte nostra possiamo senza dubbio affermare che quanto vissuto sul piano professionale ha inciso fortemente sulla maniera di concepire la progettazione futura e il nostro stesso lavoro. Va infatti riconosciuto come l'utilizzo dei mezzi socio-digitali nella prospettiva che abbiamo qui descritto abbia contribuito ad attuare processi ideativi del tutto peculiari e innovativi, sia sul piano della forma che dei contenuti, sia in remoto che, una volta possibile, nella presenza. Le pagine social hanno cessato di essere meri 'contenitori' di narrazioni e/o materiali foto-audio-video preconfezionati indipendentemente dal contesto nel quale venivano messe a disposizione dei fruitori, ma sono divenute contesti per i quali pensare a nuove forme di valorizzazione del patrimonio culturale *a partire* dalle potenzialità date da questi stessi mezzi: un'estensione pressoché illimitata dello spazio/tempo per la condivisione dei contenuti e l'accesso non forzatamente sequenziale a questi da parte degli utenti (difficile, se non impossibile, in presenza), la loro indicizzazione, la possibilità di costruire reti e palinsesti semantici, nonché interconnessioni con altri soggetti.

Portiamo a titolo di esempio il progetto ideato per la manifestazione 'Venezia 1600', che ha avuto la durata di un intero anno dal 25 marzo 2021 al 25 marzo 2022, poi prorogata fino alla fine del corrente anno solare.[47] Tale progetto aveva l'obiettivo di far emergere non già le peculiarità del Palazzo, della sua storia e dei suoi fatti artistici, ma le connessioni tra questi e l'immenso patrimonio storico-culturale della città, sottolineandone continuità e scarti.[48] I contenuti prodotti e condivisi nelle pagine Facebook e Instagram in dodici mesi sono stati pensati *ah hoc* per quel tipo di fruizione, con testi brevi (massimo 1500 battute) ma densi, con un linguaggio accessibile ed evocativo ma pun-

47 La manifestazione celebra i 1600 anni dalla fondazione mitica di Venezia. Gli istituti di cultura veneziani sono stati chiamati a proporre attività e iniziative volte a valorizzare la millenaria storia della città, attraverso un coordinamento generale dell'amministrazione comunale.

48 Pensato come un percorso immaginario all'interno del Palazzo, il progetto prevedeva approfondimenti in una o due giornate a settimana suddivisi in tre pubblicazioni a giornata, per un totale di circa 180 contenuti totali.

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tuale e mai banale, una sintassi e un approccio retorico simili a quelli di un racconto (così da coinvolgere alla lettura), un corredo iconografico ricco e funzionale alla comprensione del soggetto dei post e una forma ripetuta (titolo, hashtag, tre blocchi di testo intervallati da marcatori spaziali, uso di *emoticon*) che serviva a connettere visivamente le diverse pubblicazioni nella giornata, nella settimana e nei mesi. Inoltre tali contenuti spaziavano verso le tematiche più disparate ma sempre coerenti con l'assunto di partenza, generando una quantità di percorsi di senso e analisi – di cui una buona parte del tutto inediti – mai affrontata prima sia nel numero che nella ricchezza argomentativa, stimolando la curiosità degli utenti (come dimostrano i commenti ai post rintracciabili attraverso l'hashtag #Grimani1600) verso storie, luoghi, opere, cronologie che non appartengono strettamente al patrimonio culturale del museo ma che a questo si relazionano, anche secondo prospettive ardite, per, tra gli altri, affinità iconografica (come per la contiguità tra le storie del mito – Marsia e Callisto – di Palazzo Grimani e dei dipinti tizianeschi), richiamo al mondo lagunare (la fauna autoctona presente sia nel soffitto della Sala a Fogliami, che nella Cupola della Genesi del nartece della Basilica di San Marco) o alle tradizioni artigiane (come per l'excursus sulla tecnica degli specchi veneziani a partire da quello del Camerino di Callisto), riferimento a destinazioni d'uso degli ambienti coerenti con la consuetudine della casa veneziana o meno (il Portego come luogo dei banchetti, le cucine, la sala da pranzo) o a vicende peculiari dei membri della famiglia (ad esempio la figura di Antonio Grimani, a partire dai ritratti esposti nel Camaron d'Oro, nel contesto del *cursus honorum* dei patrizi veneziani) e così via **[figg. 8-10]**.

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Figure 8-10 Esempi di post del progetto #Grimani1600, pagina Facebook 'PALAZZO GRIMANI'

Un «patrimonio di storie» (Bodo, Mascheroni, Panigada 2016) che non sarebbe stato possibile condividere, pur in un lasso di tempo così prolungato, se non attraverso la 'vetrina' dei social network, ma che diventa ricchezza acquisita per il futuro, dal momento che per ognuno degli argomenti trattati sarebbe possibile sviluppare ulte-

riori attività, iniziative, approfondimenti scientifici.[49] Al tempo stesso, rovesciando il punto di vista temporale, solo il contesto socio-digitale poteva permetterci di svolgere un così corposo e sfaccettato percorso di valorizzazione volendo estenderlo per tutti i dodici mesi della manifestazione, senza relegarlo a una sola giornata (un convegno, un seminario) e rinnovandolo costantemente (a differenza di una mostra, che rimane 'uguale a sé stessa' per tutto il tempo della sua apertura al pubblico).[50] Tale esperienza ci ha permesso di comprendere, inoltre, che non si deve affatto temere di 'andare oltre' ai propri confini semantici, di parlare e raccontare le storie di un 'altro da sé', peraltro utili a guardare e analizzare da un diverso punto di vista le nostre, e che i social network, nella loro condizione di 'piazze' digitali che in qualche modo facilitano l'incontro (e, talvolta, lo scontro), sono un contesto ideale nel quale svolgere tale genere di attività: questo non solo non banalizza i discorsi sul patrimonio materiale e soprattutto immateriale[51] di riferimento, ma anzi li esalta, li fa risplendere, perché ne amplifica l'accesso in modo esponenziale.[52]

7 Conclusioni

A distanza di circa trenta mesi dall'avvento della pandemia, possiamo cogliere i primi frutti del lavoro che abbiamo analizzato in queste pagine sia nel contesto specifico delle pagine social, con un aumento esponenziale di follower e interazioni per Facebook (raddoppiati) e per Instagram (quasi triplicati),[53] ma anche in una costante alta affluenza di visitatori che solo parzialmente si spiega con le operazioni espositive rinnovatesi anche nel 2022 (la mostra *The Flaying of Marsyas*, dell'artista americana Mary Weaterford, organizzata in occasione della Biennale Arte 2022) e il conseguente aumento di vi-

49 Aprendo, peraltro, a nuove prospettive di ricerca scientifica.

50 In questo senso, anche i social network contribuiscono a trasformare il museo da mero 'contenitore di oggetti' a 'contenitore di storie', da 'museo di narrazione' a 'museo di connessione' (Bonacini 2020, 30).

51 Il riferimento è ovviamente alla Convenzione di Faro e alle necessità che questa ha posto agli istituti di cultura, che purtroppo spesso non vengono tradotte in azioni concrete. Crediamo che il contesto socio-digitale possa avere un ruolo importante anche nella valorizzazione dell'eredità culturale (`http://musei.beniculturali.it/wp-content/uploads/2016/01/Convenzione-di-Faro.pdf`).

52 In questo senso il presente studio tocca il concetto di accessibilità culturale, su cui non possiamo soffermarci ma che ci ripromettiamo di affrontare in altra sede. Si veda comunque Bonacini 2020, 215.

53 Alla data del 5 settembre la pagina Facebook riporta: 21.223 follower, 120.000 utenti di copertura media mensile, una media mensile di 7.000 interazioni (like, commenti, condivisioni); il profilo Instagram riporta 25.361 follower, 80.000 utenti di copertura media mensile.

sibilità sui media tradizionali e nelle 'bolle' social degli *stakeholder* coinvolti, giacché si continua a ricevere attestazioni del legame tra 'frequentazione' del museo in remoto e desiderio di farne esperienza anche reiterata in presenza.[54] Questo certamente si spiega con la progressiva definizione della 'reputazione' del museo sui social network, dal momento che «[è] attraverso il meccanismo di formazione della reputazione che i social media influiscono sulle intenzioni di visita» (Orsini, Lampis 2019, 35). Siamo in procinto di dare avvio a una nuova fase di rilevazione del feedback degli utenti che aiuterà a comprendere ancora più a fondo la situazione.

Vogliamo dunque concludere questo contributo valorizzando quanto di positivo l'era COVID-19 ha potuto consegnare al variegato mondo dei musei, ben consapevoli tuttavia delle criticità che comunque esistono, soprattutto nel contesto dei musei statali non dotati di autonomia speciale, qual è il Museo di Palazzo Grimani. Criticità dettate dalla difficoltà di reperire risorse umane e finanziarie da dedicare a mansioni di progettazione digitale e socio-digitale integrata, dai pur imprescindibili vincoli burocratici, da qualche perdurante resistenza dai vertici alla base (fortunatamente non nel nostro caso specifico) e molte altre, che tuttavia non devono diventare alibi per non progredire ulteriormente nella sperimentazione o, ancora peggio, compiere un passo indietro rispetto a quanto a oggi conquistato.

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54 Citiamo dall'analogico libro firme del museo: «Vi ho conosciuto attraverso i social. Mi sono innamorata del posto e ora sono felice di essere qui» (6 agosto 2022). Possiamo affermare dunque che le pagine social si sono inserite nel nostro *visitor journey*, consentendo a questa di essere «circolare, e ricorsivo rinsaldando da casa la relazione col museo» (Colombo 2020, 37-8).

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Recreating the Sacred Urban Space
Warsaw Churches from the End of the Second Northern War Until the End of the Reign of John II Casimir (1657-68) in the View of the Urban Onto Ontology

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Abstract During the Second Northern War (1655-60) the sacred urban space of Warsaw was demolished. Only four out of 20 church buildings survived the war intact. The others were totally destroyed or severely damaged. The aim of this article is to verify whether the continuity of the functioning of Warsaw churches was maintained in the post-war crisis period until the abdication of King John II Casimir Vasa in 1668. The analysis of changes in urban space is based on the Urbanonto ontology, which is used to describe the changes taking place within the space of the European town between the late Middle Ages and the beginning of the twentieth century.

Keywords Urban space. 17th century. War damage. Reconstruction. Ontology.

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1 Introduction

The Swedish-Transylvanian troops left Warsaw on 29 August 1657. This date marks the end of the period which started in September 1655, and left the town ruined by three occupations, imposed contributions, looting, and war damage. Although the Second Northern War continued until 1660, the area of the town itself ceased to be directly affected by the struggles after 1657 (Bogucka 1984b, 185; Wegner 1957, 131-5). The literature on the subject presents the Second Northern War, known in Poland as the Deluge, as a turning point in the history of both the entire Polish-Lithuanian Commonwealth and the urban space of Warsaw alike, as the destruction of that period negatively influenced the further development of the Polish state. The sacred urban space of Warsaw was demolished, too. Before the war there were 20 church buildings in Warsaw, but only four survived intact. The others were totally destroyed or severely damaged. The aim of this article is to verify whether the continuity of the functioning of Warsaw churches was maintained in the post-war crisis period. I will look at the development of church topography after the end of the war until the abdication of King John II Casimir Vasa in 1668, taking into account how individual buildings changed over time (getting rebuilt, restructured or moved), but still continued to be identified as the same object. I intend to analyse the continuity of such objects in the urban space. Using the example of churches, I will discuss the issues of continuity and changes in the functioning of the town.[1] Urban reconstruction required appropriate financial resources, which were difficult to obtain in Warsaw, as it was devastated both materially and demographically. In this context, I will check which actors were responsible for individual churches, whether it was the king, church authorities, magnate families, specific religious orders, municipal authorities or the townspeople themselves.

The analysis of changes in urban space was based on the Urbanonto System, which is made up of three components: the ontological component (the Urbanonto ontology), the database component and the data presentation component (Geoserver and RDF triple store) (Garbacz, Grądzki 2021, 4).[2] The creation of the Urbanonto ontology was one of the goals of the "Historical Ontology of Urban Space" (HOUSe) project. It is a domain ontology which aims to conceptualise the history of topographic objects as depicted in topographic maps

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1 To read more about the issue, see Madurowicz 2017.

2 To read more about the usage of The Urbanonto System, see Garbacz, Grądzki 2021.

(Garbacz, Grądzki 2021, 5).[3] The use of ontologies in relational databases serves the purpose of efficient data retrieval and information sharing. The Urbanonto ontology is another example of implementation ontology in historical research (Słomska-Przech, Słomski 2022, 2). It could be used to describe the changes taking place within the space of the European town between the late Middle Ages and the beginning of the twentieth century and identify the permanent elements which constitute the town. In the Urbanonto system, ontology serves as a glossary of terms connected with urban representation and as a resource containing the data used in the database (list of topographic object types and list of functions). What is more, the Urbanonto ontology makes direct use of two other ontologies: BDOT10k ontology and ontohgis ontology (Garbacz, Grądzki 2021, 5). BDOT10k ontology is based on the Topographic Object Database (*Baza Danych Obiektów Terenowych*). It is a vector database which accumulates the spatial location of topographic features along with a description of their properties. The content and detail level of the Topographic Object Database corresponds to a traditional topographic map at the scale of 1:10,000.[4] Ontohgis ontology is a predecessor of The Urbanonto ontology. It is a domain ontology focused on settlements units and administrative units (Garbacz 2019, 471).[5]

The database, which is managed with PostgreSQL, by means of Postgis extention, contains information about specific topographic objects and manifestations of such attributes of these objects as: name, location, function and type. It also includes data on the mutual origin of these objects (Garbacz, Grądzki 2021, 8). The database is made up of two diagrams: "ontology_sources" and "ontology". The first includes tables with 'raw' data. The second presents 'refined' data, especially for locations (which are purified by a cartographic expert) and dates (imprecise dates are automatically remapped as precise) (Garbacz, Grądzki 2021, 8). The database aggregates information on the elements of the historical space of Warsaw that can be depicted on a town map. Various sources, from monographs, to encyclopaedias and atlases, are used to try to collect information about objects that exist or have existed in the town. Each of the objects is described using such categories as their assigned names, location, ontology type, and other functions it could have performed or its connections with other objects. This, in turn, allows to register

3 The Urbanonto ontology is stored in a git repository, see: `https://github.com/urbanonto`.

4 `https://www.geoportal.gov.pl/dane/baza-danych-obiektow-topograficznych-bdot`.

5 To read more about ontological foundations for building historical geoinformation systems project and ontohgis ontology, see Szady 2019.

how a given object has changed and how it was referred to in different periods. The important question of identity is analysed in foundational ontologies in several different ways.[6] Also, the definition of 'place', which is very significant for the Urbanonto Ontology, is differently specified in other ontologies (Ballatore 2006; Hamzei, Winter, Tomko 2020).

The implementation of the Urbanonto Ontology and database may be useful in the process of development of further studies in the series of historical town atlases conducted under the auspices of the International Commission for the History of Towns. This project is meant to form the basis for comparative studies of urban spaces.[7] However, before this can be achieved, it is necessary to check the usefulness of the tool in relation to available sources and try to define what it means that an object ceases to exist or what conditions must be met for one object to be replaced by another. Sources and studies will not always be easy to enter into the database and may require interpretation.

An example of describing changes in the urban space using The Urbanonto System is the Church of St. George of the Canons Regular in Warsaw. The first object was a wooden church which existed from 1339 until 1453, when its function was taken over by a new brick church with the same *patrocinium*. Both objects, despite the same name and function, are two different entities according to the ontology. The brick church of St. George was in use until 1819. Then this building became a factory and in 1897 it was finally demolished. In this case, although the same building existed in the same place without significant break, the change of function meant that church and factory are also two different entities.

The Urbanonto System takes into account that a given type can have not only dominant functions, but also additional ones. They can be defined both at the ontology level (they can appear with all objects of a given type) and in the database, as functions which are characteristic for a specific object. In the urban landscape, churches also function as landmarks, e.g. as unique, often monumental buildings which make it possible to describe the urban space and define the location of other elements of space in relation to their own positions.[8]

6 To read more about foundational ontologies and methodology for validating the ontological adequacy of taxonomic relationships, see: Borgo, Galton, Kutz 2022; Guarino, Welty 2009.

7 To read more about the project, see: https://urbanonto.ihpan.edu.pl/about-project/; and about The European Historic Towns Atlases, see: https://www.uni-muenster.de/Staedtegeschichte/en/portal/staedteatlanten/index.html, https://www.historiaurbium.org/activities/historic-towns-atlases/.

8 Churches retain their landmark function to this day. To read about churches as landmarks in contemporary Upper Silesian cities, see Bierwiaczonek 2011.

In addition, other functions of churches may be associated with political purposes (they may be used to celebrate state or municipal ceremonies), or linked to taking advantage of the prestige or defensive qualities of the building.

In the database "ontology_sources" diagram for the Church of St. George of the Canons Regular in Warsaw, data were provided in several tables. First, in the "topographic_objects" table there are three unique objects: ID 17 – Church of St. George in Warsaw, ID 18 – Church of St. George in Warsaw, ID 47 – former Church of St. George in Warsaw **[fig. 1]**.

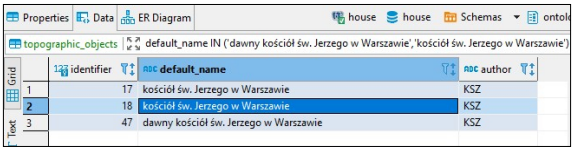


Figure 1 Church of St. George in Warsaw in the topographic_objects table

Then in the "topographic_object_type_manifestation" table we entered data about types from the Urbanonto ontology related to those objects: ID 17 (wooden church building) had a church type from 1339 to 1453, ID 18 (brick church building) had a church type from 1453 to 1819 and ID 47 had a factory type from 1819 to 1897 **[fig. 2]**.

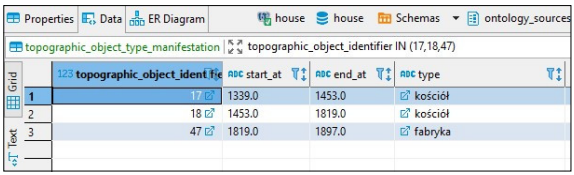


Figure 2 Church of St. George in Warsaw in the topographic_object_type_manifestation table

In the "topographic_object_provenances" table we provided data on the substitutability of objects. When the brick church replaced the wooden one, there is a record where ID 17 is an ancestor and ID 18 is a successor. Then when the church building was used as a factory, we have got a record where ID 18 is an ancestor and ID 47 is a successor **[fig. 3]**.

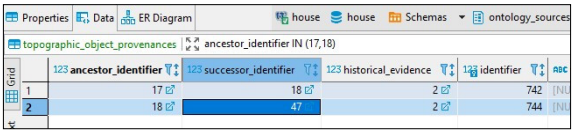


Figure 3 Church of St. George in Warsaw in the topographic_object_provenances table

In the "topograhic_object_name_manifestations" we provided data about all known names of those objects with additional information about date of use and whether it is a primary (*nazwa podstawowa*) or secondary name (*nazwa oboczna*) **[fig. 4]**.

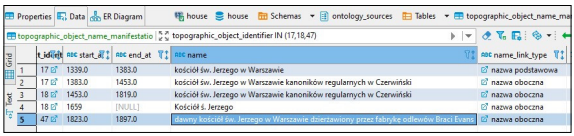


Figure 4 Church of St. George in Warsaw in the topographic_object_name_manifestations table

Data about location of objects are provided in two tables. In the "location_raw" table we provided ID for location. In this example all objects had the same localisation, so in the table there is only one record with ID 6 **[fig. 5]**.

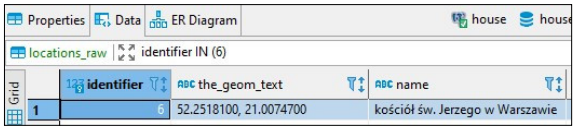
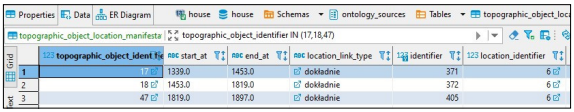


Figure 5 Location of Church of St. George in Warsaw in the location_raw table

Then, in the "topographic_object_location_manifestations" table we linked ID of objects with ID of location and added information about dates and type of this link (for example exact or approximate location) **[fig. 6]**.



	topographic_object_ident	start_at	end_at	location_link_type	identifier	location_identifier
1	17	1339.0	1453.0	dokładnie	371	6
2	18	1453.0	1819.0	dokładnie	372	6
3	47	1819.0	1897.0	dokładnie	405	6

Figure 6 Church of St. George in Warsaw in the topographic_object_location_manifestations table

In the database there are also other tables where data is entered if necessary. All tables of the "ontology_sources" diagram are presented in figure 7 **[fig. 7]**.

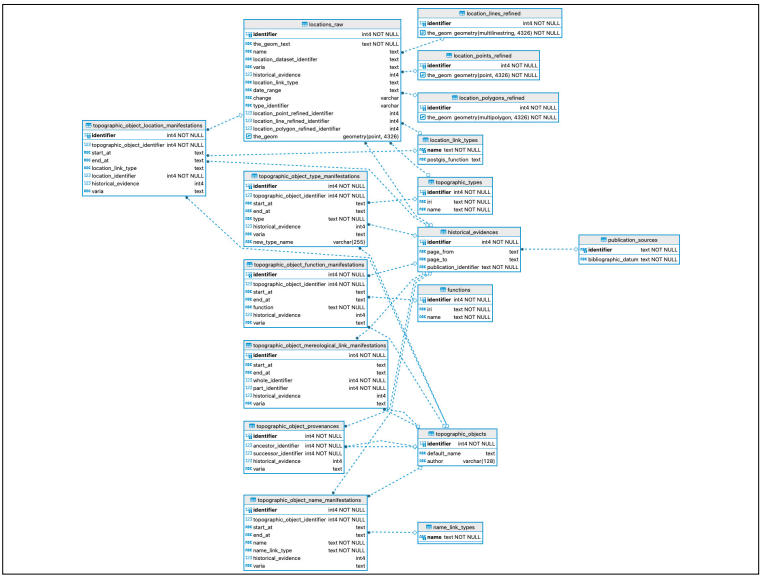


Figure 7 Tables of ontology_sources diagram (Garbacz, Grądzki 2021, 10)

For the purpose of this article, the analysis of sources will be limited to objects which were classified as representing the 'church' type in the Urbanonto ontology. This type belongs to a group of buildings which were intended foremost to be used for religious purposes (i.e. also an Orthodox church, a mosque, a synagogue, and a free-standing chapel). A church is defined as "a building in which a religious community gathers to hear the word of God, conduct a group or private prayer and celebrate the sacraments", while a free-standing chapel is defined as "a small Christian sacred building used for worship purposes (e.g. to conduct a mass or pray) or (rarely) as a burial place,

which include an altar or altars".[9] These two definitions are quite similar to each other, which results from the lack of a clear boundary between the afore-mentioned types of buildings.[10] The distinction is based primarily on the observer's assessment of whether the size of a given temple indicates that it is still small enough to be a chapel or already big enough to be called a church, as well as canon law, established naming conventions or the intentions of the entity that initiated the construction of the building. Churches were also meeting and social places and shaped the space around them (e.g. through the houses or entire streets inhabited by the clergy, establishment of schools and cemeteries, or nearby streets and squares being named after the church). Among the sources taken into account, only the 1669 Inspection includes a reference to a "chapel" – one related to the Moscow Chapel in Krakowskie Przedmieście. In this case, indication of the object's type is part of its proper name.

2 Sacred Space

There is a relatively long tradition of writing about the presence of objects strongly related to the sacred sphere in urban spaces. Mircea Eliade pointed out that every manifestation of the sacred is a paradox – just like a sacred stone that at some level still remains just a stone (Eliade 2008, 7-9). Similarly, a building dedicated to worship is also just another object located in a specific physical place. The sacred can manifest in multitude ways within the urban space, which allows for conducting studies from many perspectives.[11] Halina Manikowska mentioned several types of studies on urban sacred space: sacred geography, sacred topography and ecclesiastical topography. According to her, sacred geography is most comprehensive in its approach, as it deals with activities which are undertaken by communities with the aim of harmonising the material framework of their environment with the supra-material rules that govern their lives. Such actions result in the creation of places which are predisposed to bring the temporal in contact with the supernatural. In such an approach, sacred geography differs from sacred topography and ecclesiastical topography, which deals only with institutional and social issues. On the contrary, it puts emphasis on the perception of

9 Both definitions are taken from the HOUSE ontology available at the following URL address: `https://github.com/UrbanOnto/urbanonto`.

10 Jerzy Rajman uses the term "church in the rank of a chapel" for all temples which are not cathedrals, and collegiate or parish churches, cf. Rajman 2021, 512.

11 The topic of the links between the contemporary city and the sacred sphere was discussed in Kowalewski, Królikowska 2011.

time and space and analyses the relations between these two categories. Sacred geography is mobile and dynamic, which means not only that the number of churches, altars, and celebrated holidays keeps growing, and the liturgy continues to develop, but also that some elements can disappear, temporarily or completely (e.g. when there is a church fire and the building is not used for some time) (Manikowska 2010, 51-6). The dynamics of the sacred – successive waves of sacralisation and desacralisation of space – are characteristic for many places and clearly visible in research on contemporary towns, as exemplified by works on contemporary Warsaw or Prague (Madurowicz 2002; Derdowska 2006).

These issues are also described in the works devoted to the sacred space of the towns where the influence of different denominations or religions collided. Using the example of seventeenth-century Lyon, Natalie Zemon Davis demonstrated how the sacralisation of space changed depending on whether Calvinists or Catholics dominated in a given town. In 1562, the Huguenots desecrated the Catholic sacred space, by, among other things, changing the functions of sacred buildings (chapels, monasteries, chapter houses) to secular purposes (shops, craftspeople's workshops or residential buildings), organising public squares in cemeteries or marking out new streets where the demolished monasteries used to stand (Davis 1981, 58). Similarly, Andrew Spicer demonstrated how the Huguenots seizing the power in Orleans in 1562-63 and 1567-68 influenced the reorganisation of sacred space. Some temples began to serve the needs of Protestants, and some were used for secular purposes (as stables, arsenals or residential buildings), with these temples getting destroyed before the Huguenots left the town in 1568. In the case of Orleans, Catholics tried to restore the destroyed religious infrastructure when they regained control of the town in 1563 and 1569 (Spicer 2007a, 253-8).

Studies of sacred spaces in the Middle Ages and early modern times indicate that the rigid division between sacred and profane remained largely a postulate only, and that the boundary remained blurred in everyday life (McNamara 2015, 215-16).[12] The sacred not only meets the profane in places designated for this purpose, but also mixes with it, and the very difference between the sacred and the temporal is largely in the eye of the beholder. The Reformation brought a new understanding of the sacred, one which did not identify places which were especially sensitive to contact with the sacred – a radical departure from the Catholic approach. However, it had to contend with the habits of congregations concerning the sacredness of specific places, as well as new beliefs linking the concept of sacred-

12 Collective works on sacred spaces include such significant publications as: Hamilton, Spicer (2006); Coster, Spicer 2007; DeSilva 2015.

ness to places of worship, as demonstrated for England and Scotland by Andrew Spicer (2006; 2007b). Similarly, Terese Zachrisson (2019) discussed the problems with believers creating and using unofficial places of worship located along roads, in fields, or forests in early modern Lutheran Sweden. The higher-ranking clergy treated such unofficial temples with suspicion, as a sign of superstition or idolatry.

The very location of churches and other sacred sites and their influence on the surrounding space has also been the subject of separate studies. Referencing the example of pre-location Polish settlements such as Cracow, Wrocław, Gdańsk, Sandomierz and presumably Płock, Marian Morelowski (1966) hypothesised that monumental ecclesiastical and secular buildings were located along the most important roads in such a manner as to form the shape of a cross. Krzysztof Skwierczyński (1996) used his analysis of the location of churches in Polish bishopric seats in the eleventh and twelfth century to propose that they were arranged in space in a very intentional way to ensure that the central church was surrounded by a ring of ecclesiastical foundations, and in some cases, the churches would form a cross within the layout of the town space. Gábor Klaniczay's study was devoted to the analysis of the location of two sacred sites in medieval Buda – the Mountain of St. Gerard and the Margaret Island – and their influence on the town and its inhabitants (Klaniczay 2016). Hélène Noizet (2020) tried to analyse how medieval churches of a certain type, belonging to various orders, influenced the development of their surroundings, using the example of Paris between the ninth and nineteenth century.

3 Warsaw: War and Topography

The layout of seventeenth-century Warsaw was heterogeneous. It included: two royal towns with medieval origins located on the Vistula Scarp above the Vistula River, known as Stara Warszawa (Old Warsaw) and Nowa Warszawa (New Warsaw), vast areas of suburbs, and *jurydyki*[13] – small privately–owned towns exempted from the jurisdiction of Stara Warszawa and Nowa Warszawa whose owners included representatives of nobility and clergy, but also monasteries and hospitals. The beginnings of the development of nobility-held *jurydyki* precedes the outbreak of the war by a few years. Leszno was established in 1648, and Grzybów in 1650. By 1721, there were 16 *jurydyki* on the left bank of the Vistula and another two on its right bank (Radziwonka 2019, 52-8; Lileyko 1984, 26-7). There was also

13 *Jurydyki* (sing. *jurydyka*) were enclaves owned and ruled by entities other than the governing authorities of the town where a given *jurydyka* was located.

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a noticeable size disproportion between the area of the royal towns (which together covered about 26 hectares) and the expanding suburbs and *jurydyki* (which together held a larger area than the two chartered towns combined) (Bogucka 1984a, 19).

The growing popularity of Warsaw was related to several decisions that facilitated its growth as a political centre. The meetings of the Warsaw *sejmik* (dietine) began to be held in Warsaw already in the sixteenth century. Both the general *sejmik* of the Masovian Voivodship and the general *sejm* (diete) were moved to Warsaw in 1569, and the elections of the new rulers of the Polish-Lithuanian Commonwealth were also held in the town's immediate vicinity. The final confirmation of the town's new central status came with the permanent transfer of the royal court to Warsaw. The move began in 1596, after the fire at the royal apartments at the Wawel Castle, and ended in 1611 (Bogucka 1984a, 13-14; Radziwonka 2019, 32; Wrede 2013). The presence of the royal court was a huge draw, attracting not only members of the political elite who built their own palaces in the suburbs of Warsaw, but also merchants, craftsmen, and servants. The number of permanent and temporary residents of Warsaw increased, the suburbs grew, taking up more and more space, with the number of new buildings rising in tandem. The town continued to expand in an almost uncontrolled manner until the start of the war, which heralded its material and demographic catastrophe.

The Second Northern War was initially fought between Sweden and the Polish-Lithuanian Commonwealth, and did not have a religious basis. When the Swedish king, Charles X Gustav, invaded the Polish-Lithuanian Commonwealth, he counted on a quick coronation. However, as the conflict continued, religious antagonisms between the sides came to the fore, and the Protestant attackers were pitted against the Catholic defenders. The defence of the Pauline Monastery of Jasna Góra and the Lwów Oath of King John II Casimir, in which the king entrusted the Commonwealth to the protection of the Blessed Virgin Mary, became the symbols of resistance against the Swedish forces. The heightening of religious sentiments was also noticeable in Warsaw. Reportedly, during the town's siege by the Transylvanian army, the churches were filled with people receiving the sacrament of penance, and the sermons called for a fight against the heretical enemy (Wegner 1957, 132).

According to the literature on the subject, the areas located outside the town walls saw greatest damage to town buildings. The town of Nowa Warszawa and the suburbs of Stara Warszawa were hit most severely (it is estimated that in certain streets between 50% and 90% of the buildings were affected) (Przybyłek 2015, 283). In 1656, while preparing the defence against advancing Commonwealth troops, the Swedish army secured church buildings located outside town gates, incorporating them into the defence system, and

set fire to the suburbs around Stara Warszawa and the area of Nowa Warszawa, thus destroying local buildings (Bogucka 1984b, 181-3; Wegner 1957, 74-5). Similarly, the suburbs and Nowa Warszawa were damaged again during the siege of 1657, when the town, protected by Polish troops, was attacked by the Transylvanian army led by George II Rákóczi, an ally of Charles X Gustav. The Polish troops set fire to the Church of the Bernardine Fathers, which led to the destruction of not only the sacral buildings, but also the food supplies stored at the monastery – a move which accelerated the capitulation of the town (Bogucka 1984b, 185; Wegner 1957, 131-5). Post-war Warsaw consisted of Stara Warszawa surrounded by town walls and expanses of devastated areas filled with ruins and fire-ravaged land.

The war resulted not only in the destruction of buildings, but also in significant population losses. According to the most recent estimates, the number of the town's inhabitants may have dropped from 18,000 to 5-6,000 in 1659, i.e. to the level of about one third of the original population (Przybyłek 2015, 283). On the other hand, Eugeniusz Szwankowski's earlier findings were even more pessimistic. Szwankowski (1952, 78) argued that the population of the town fell to 10% of its pre-1655 population. The main reason which makes it difficult to have an accurate estimate of the scale of population losses is the destruction of archival records during World War II, which has rendered it impossible to determine the size of Warsaw's population before 1655. Wanda Szaniawska (1966, 130-5) estimated that the 1620 population of Stara Warszawa and Nowa Warszawa, together with the suburbs under municipal jurisdiction, amounted to 8,000. Maria Bogucka (1983, 96-7), in turn, estimated that the population of the entire Warsaw complex (including Praga and Skaryszew) amounted to 25,000-30,000 residents. The upward trend was to continue until the outbreak of the war, as the royal court and noble manors and palaces attracted new residents to Warsaw, including people from outside the Polish-Lithuanian Commonwealth (Kersten 1971, 115-23). The demographic recovery of Warsaw's population probably occurred very quickly after the Second Northern War. At the end of the seventeenth century, Stara Warszawa and Nowa Warszawa combined might have been inhabited by about 20,000 people (Bogucka 1984b, 188-9).

The history of Warsaw in the seventeenth century in a nutshell: in the first half of the century, the town developed very rapidly, its area grew, as did its population and the number of buildings – all driven by the actions of the king and his family, secular and clergy dignitaries, and also municipal communes and the townspeople themselves. Then came the war, which cut down this growth, followed by a period of recovery and rebuilding.

4 Religious Denominations in Warsaw

The sacral space of seventeenth century Warsaw was dominated by Roman Catholic churches. The Jewish commune, which had a synagogue inside the walls of Stara Warszawa, was dissolved in 1527 by virtue of a privilege issued by King Sigismund I the Old (Ringelblum 1932, 28-33). Until the 1760s, Jewish migration to Warsaw was sporadic, and despite some individuals and groups' attempts to settle in the town, no new commune was established. In 1570, Sigismund II Augustus confirmed his father's privilege, but allowed Jews to stay in Warsaw during the *sejm* sessions (Ringelblum 2018, 5-6). This presence at the sejm was also connected with the Jewish community's links to the nobility. The Council of the Four Lands, which was the central body of Jewish self-government in the Polish Crown, forbade Jews to settle in Masovia, because their moving could deplete tax revenues for their current communes (Ringelblum 2018, 8).

The Warsaw Protestants did not manage to obtain permission to build their own temple. In the times of the Duchy of Masovia, in 1525, the Duke Janusz III issued a privilege which forbade promoting Luther's teachings in Masovia under the penalty of death and forfeiture of one's property to the ducal treasury (Schramm 1963, 557). In the second half of the sixteenth century, there were attempts to build an evangelical church, but they proved unsuccessful. In the following decades the services were held in private residences of Protestant (mostly Reformed) magnates and nobility, especially during the *sejm* sessions. The situation changed in the mid-seventeenth century, when the Warsaw Lutherans (officers of the royal guard, officials and servitors of the royal court, as well as merchants and craftspeople) made efforts to obtain permanent pastoral care and received help from Bogusław Radziwiłł, who agreed to set up a separate parish for Warsaw at the local Reformed Evangelical church in Węgrów, a town of his which was located about 70 km east of Warsaw. Another concession came in 1671 when the Bishop of Poznań, Stefan Wierzbowski, recognised the Protestant merchant and craftspeople of Warsaw's right to the cemetery situated in Leszno, and allowed for prayers and religious singing to be conducted at home (Kriegseisen 2008, 9-11). The number of Protestants in Warsaw did not begin to grow rapidly until the first half of the eighteenth century (77).[14]

14 To read more about the Warsaw Evangelicals in later periods, see: Kuc-Czerep 2021, 210-29; Stegner 1992; Stegner 1993.

5 Sources

In this article, I will focus on the reign of King John II Casimir Vasa, until his abdication in 1668. This decade was a key period for the reconstruction of Warsaw. It was also suggested at that time that the town's urban space should be reorganised in a more orderly manner (which did not come to pass, due to a complicated land ownership structure) (Bogucka 1984b, 188-90). The literature about Warsaw promotes the opinion that the town itself was basically rebuilt by 1670, and the following years constitute the period of its expansion (Szwankowski 1952, 78-9). A comparison of the following two sources will be used to reach the goal set for this analysis: *Rewizja Gospód Starej i Nowej Warszawy z 1659 r.*[15] (Inspection of the Taverns of Stara Warszawa and Nowa Warszawa of 1659) and *Rewizja Gospód Starej i Nowej Warszawy z 1669 r.*[16] (Inspection of the Taverns of Stara Warszawa and Nowa Warszawa of 1669). Editions of both these sources were published side by side in 1963 in a volume titled *Źródła do Dziejów Warszawy. Rejestry Podatkowe i Taryfy Nieruchomości* (Sources for the History of Warsaw. Tax Registers and Property Tariffs), which already suggests that they are interlinked. The same cannot be said about the manuscripts which were used as the basis of these editions. The 1659 Inspection is now part of unit no. 1431 in the Warsaw Town Books: Economic Fonds in The Central Archives of Historical Records in Warsaw. It contains unbound files, including: a list of real properties in Stara Warszawa and its suburbs from 1655, a fragment of the Masovian Voivodship inspection concerning the Warsaw starosties from 1660, an inspection and measurement in rods (*pręty*) of Warsaw streets for paving from around 1700, a fragment of the inspection of Stara Warszawa from 1722 and the inspection of Stara Warszawa from 1669. The last of the mentioned documents is stapled together with the inspection of 1659 (1659 Inspection, 156),[17] which is of interest for this article. Taking into account the titles themselves, the subject matter of the documents collected in this unit focuses mainly on real properties in Stara Warszawa. On the other hand, the 1669 Inspection is based on a document constituting part of the code created for the Grand Marshal of the Crown, Józef Wandalin Mniszch (1670-1747), which is kept by the Institute of History of the Polish Academy of Sciences in Cracow. In addition to the inspection, it includes documents regard-

15 Hereinafter: "1659 Inspection".

16 Hereinafter: "1669 Inspection".

17 WE, Warszawa-Ekonomiczne, ref. no. 1431, Warsaw: The Central Archives of Historical Records, digitalised copies are available on the Search the Archives website: https://www.szukajwarchiwach.gov.pl/jednostka/-/jednostka/17726774.

ing the functioning of marshal offices and the above-mentioned measurements (in rods) of Warsaw streets for paving from 1700. In this case, the unit in which the inspection is stored is focused on documents concerning the functioning of the office of the Grand Marshal of the Crown, which also covered matters related to accommodation. The publishers of both sources, Anna Sucheni-Grabowska and Hanna Szwankowska, noticed a similarity between *Rewizja Gospód Starej i Nowej Warszawy z 1669 r.* and the above-mentioned inspection of Stara Warszawa from 1669 kept in the Central Archives of Historical Records, and used the latter to correct errors made by the code's writer in the surnames (1669 Inspection, 201).

The publishers noted that the Inspections of 1659 and 1669 were similar in scope and focused primarily on recording the number of plots of land available for use, along with information about the entities authorised to allocate them to users. In 1659, the inspection was conducted while checking the town's condition after the war, and, in 1669, it was done for the approaching first *sejm* under the reign of the new king, Michał Korybut Wiśniowiecki (1659 Inspection, 157-8; 1669 Inspection, 198-201). The church buildings were recorded in the inspections as side notes, as recognisable points of reference in the urban space. The inspectors did not pay attention to the condition of the church buildings, their operation or even decommissioning, and they sometimes overlooked the locations of a small number of temples. The inspections are also similar because of their nature, as they both constitute physical inventories. The persons responsible for the inspections walked along certain streets, holding papers in their hands, and listed real properties they passed along the way. What is more, the edition of the documents links the places mentioned in the manuscript with the land and mortgage register numbers assigned to individual plots of land in 1784, which basically survive to this day (Sucheni-Grabowska 1963, 16). Consequently, it was possible to connect objects from the past with the currently existing ones. One of the goals of the HOUSe project also is to link information about objects that existed in the same places, such as plots.

In the case of both inspections, information about urban space was preserved by means of a long transmission: the data entered into the database is taken from the edition of sources that the publishers took from the manuscripts created as a result of the town's physical inspections.

6 Recreating the Sacred Urban Space of Warsaw

When judged in the context of the entire country, Warsaw was not a significant ecclesiastical centre. It was the seat of the Archdeaconry of Warsaw and an enclave of the Catholic Diocese of Poznań, directly bordering the Archdiocese of Gniezno and the Dioceses of Płock and Cracow. Warsaw itself was located near the border of the archdeaconry, while the area on the right bank of the Vistula was part of the Płock diocese (Nowacki 1964, 35-9). The highest-ranking church in the hierarchy was the Collegiate Church of St. John the Baptist, located within the walls of Stara Warszawa, which also served as a parish church and provided services to the king and his court (Putkowska 1991, 195). The second parish church of medieval origin, dedicated to the Blessed Virgin Mary, was located in Nowa Warszawa. In 1626, a third parish was established, with its seat in the Church of the Holy Cross in Krakowskie Przedmieście, until then, a filial church to the collegiate church (Nowacki 1964, 587). The Warsaw parish churches were located along the north-south line: the Church of the Blessed Virgin Mary in Nowa Warszawa, the Collegiate Church of St. John the Baptist within the walls of Stara Warszawa, and the Church of the Holy Cross in Krakowskie Przedmieście. Warsaw's ecclesiastical topography was reorganised in the first half of the seventeenth century, during the reign of Sigismund III Vasa (1587-1632) and his son, Ladislaus IV Vasa (1632-48). Before this period, there were only six churches in the town. However, numerous foundations were established in Warsaw (mainly monasteries) before the Second Northern War, with new churches built in their vicinity. According to Jolanta Putkowska, wooden places of worship were built first (temporary free-standing chapels or churches), and brick churches were erected only at a later stage (Putkowska 1991, 184). By the outbreak of the war, there were 15 churches in total in Warsaw, and four more were under construction. Potentially, there could also have been some sort of temple next to the monastery of the Brothers Hospitallers of St. John of God in Leszno, and even though not much is known about it, for the purpose of this article I will assume that it existed.[18] That gives 20 buildings in total. Taking into account the location of the individual churches, it is possible to distinguish four topographic units: Unit I within the walls of Stara Warszawa, Unit II in Nowa Warszawa, Unit III in the northern suburb of Stara Warszawa – from Freta Street, along Długa Street –, and Unit IV in Krakowskie Przedmieście. Unit I included the Collegiate Church of St. John the Baptist (a brick building), the

18 A. Kersten notes, maybe on the basis of the writings of Julian Bartoszewicz, that a wooden building and a monastery and the Church of Brothers Hospitallers were built in 1650 (Kersten 1971, 36; Bartoszewicz 1855, 233).

Church of the Order of Hermits of Saint Augustine (a brick building) and the Jesuit Church (a brick building). Unit II included: the parish Church of the Blessed Virgin Mary (a brick building), the Church of St. George of the Canons Regular of Czerwińsk (a brick building), the Church of St. Benno which belonged to the St. Benno's Brotherhood (a brick building), and the Franciscan Church (a wooden building). Unit III included: the Church of the Holy Spirit under the auspices of the town council of Stara Warszawa (a brick building) and the Dominican Church (a brick building), two Piarist churches (one wooden and one brick building under construction) and the Bridgettine Church (brick), which was under construction. Unit IV included the churches of Bernardine Fathers and Bernardine Sisters (both brick buildings) and the churches of the Discalced Carmelite Friars and Nuns under construction (both brick buildings), as well as the Visitationist Church (a wooden building) and the parish Church of the Holy Cross (a wooden building). Only the Church of the Franciscans Reformed at the Sigismund Embankment in Senatorska Street (a wooden building) and the Church of the Brothers Hospitallers in Leszno (probably a wooden building) remained peripheral to these units.

Churches located within the walls of Stara Warszawa survived with the least amount of damage. On the other hand, according to the inspection of royal estates of 1660, Nowa Warszawa was completely burnt down (Wawrzyńćzak 1989, 29). The parish and Franciscan churches located in the area were most likely destroyed by fire as well, while the Church of St. Benno was damaged, but managed to avoid burning. The fate of the Church of St. George is unknown (Kałamajska-Saeed 2001, 2, 5, 25).[19] The suburban Dominican church was damaged during the war and required renovation. What is more, two villages which constituted the endowment of the monastery were also destroyed, which limited the financial resources of the order after the war (Przybyłek 2015, 270; Kałamajska-Saeed 2001, 41). The Church of the Holy Spirit (turned into part of the town fortifications) and the Piarist monastery complex in Długa Street were also destroyed (Putkowska 1991, 230). However, the Bridgettine Church at the end of Długa Street, which had been under construction since 1652, got through the war unscathed.[20] On the southern side of Warsaw, the churches were either destroyed (churches of the Bernardines, the Discalced Carmelite Friars and Nuns, and the Visitationists) or damaged (churches of the Holy Cross and the Francis-

19 A different opinion was formed by Ryszard Mączyński (2008, 38) who believes that the buildings of the brick churches of Nowa Warszawa and the northern suburbs (the parish church of Nowa Warszawa, as well as the Church of St. Benno, St. George Church, St. Hyacinth Church, and the Church of the Holy Spirit) remained standing after the war, although they had been "chipped".

20 Putkowska 1991, 230.

cans Reformed) (Putkowska 1991, 230). It is possible that the Leszno buildings which belonged to the Brothers Hospitallers were also destroyed during the war (238).[21] The condition of the Church of the Bernardine Sisters after the war is unknown. To sum up: all churches of Unit I survived the war with no significant damage; in Unit II, two churches were burnt down and had to be rebuilt, one was damaged, and the fate of one church is unknown; in Unit III one church was damaged, three were destroyed, and one suffered no significant damage; and in Unit IV one church was damaged, four were destroyed, and there is no data about one church. Of the two remaining churches, one was damaged and the other destroyed.

When discussing the presence of churches in the post-war space of Warsaw, it should be noted that each of the sources taken into account covered a different area of the town. While their core is common (including Stara Warszawa and Nowa Warszawa, the suburb from Freta Street through Długa Street, and Krakowskie Przedmieście), the scope of coverage of the Warsaw suburbs varies across the documents. In the context of the study of Warsaw churches, the most important issue is the fact that the buildings in Leszno appear in the 1669 Inspection, but are not recorded in the 1659 Inspection, so there is no information on the monastery buildings of the Brothers Hospitallers two years after their last occupation. The table below summarises information on the recorded churches, and where no church was noted, it indicates which other object of a given congregation was registered or notes that it was not included in a given document. Buildings which were funded after the date of a given source are entered into the table with the "not applicable" annotation.

Table 1 Own work, based on the 1659 Inspection and the 1669 Inspection

No.	Church	Topographic unit	1659 Inspection	1669 Inspection
1	Collegiate Church of St. John the Baptist	I	church	church
2	Jesuit Church	I	church	church
3	Augustinian Church	I	church	church
4	Parish church of BVM	II	church	church
5	Church of St. Benno	II	church	church
6	Franciscan Church	II	church	new church, old church
7	Church of St. George of the Canons Regular	II	church	not included

21 A. Kersten (1971, 97) mentions a Carmelite church in Leszno as one of the churches destroyed during the war. The order was brought to Leszno in 1677, and the church was built in 1683-1731. The author may have meant the Brothers Hospitallers.

No.	Church	Topographic unit	1659 Inspection	1669 Inspection
8	Dominican Church	III	church	church
9	Church of the Holy Spirit	III	church	church
10	Piarist Church I	III	not included	house
11	Piarist Church II	III	not included	house
12	Bridgettine Church	III	church	church
13	Church of the Bernardine Sisters	IV	church	church
14	Church of the Bernardine Fathers	IV	not included	church
15	Church of the Discalced Carmelite Nuns	IV	two empty plots	church
16	Church of the Discalced Carmelite Friars	IV	church	church
17	Visitationist Church	IV	monastery	church
18	Parish church of the Holy Cross of the Vincentians	IV	church	small church
19	Church of the Franciscans Reformed		indication of the direction: "from the Bernardine Reformers"	church
20	Church of the Brothers Hospitallers in Leszno		not applicable	small monastery
21	Church of the Brothers Hospitallers in the suburb		not applicable	monastery

Information presented above leads to the conclusion that despite the extensive damage brought by the war to the urban and suburban buildings, most of the Warsaw churches which had existed before this conflict (nos 1-20) remained identifiable in 1659 and 1669. The 1659 Inspection mentioned 13 churches directly, and the 1669 Inspection listed 17. According to the first document, in 1659, the non-existent churches include the unfinished Church of the Discalced Carmelite Nuns (the inspection mentions only an empty square where the entire monastery complex used to stand) and the Visitationist Church (only the monastery was recorded in the inspection). Furthermore, the Franciscan Reformers were mentioned twice as a point of reference for the chosen direction, without any specific mentions of any of their properties, and the churches of the Piarists and Bernardine Fathers were not included in the inspection. On the other hand, in 1669, the following churches can be classified as non-existent: the Piarist Church (only a house is mentioned) and the Church of the Brothers Hospitallers (the inspection records the order's old monastery in Leszno and a new one in the suburbs). The inspection ignores the Church of St. George, which still existed at that time, but

records that the land belonging to the provostry of this church on Świętojerska Street was built-up (1669 Inspection, 557).

Identifying the location of pre-war and post-war churches is another issue that has to be taken into consideration. Most of the churches destroyed or devastated during the war were rebuilt in the same places or on the same plots of land. In Warsaw, there were only two cases of significant transfers of foundations: the Discalced Carmelite Nuns and the Brothers Hospitallers. The buildings which belonged to the Carmelite Nuns were completely destroyed. The founders' daughter, Helena Tekla née Ossoliński, and her husband, Aleksander Lubomirski, decided to renew the foundation in 1661 and, a year later, moved it into part of the Kazanowski Palace adjacent to the Bernardine Fathers monastery. The fact that the church is mentioned as located in the new place as early as in 1669 is interesting because, as was established in the literature of the subject, the actual construction of the Church of St. Teresa of the Discalced Carmelite Sisters did not begin until 1696-99 (Lorentz 1962, 64; 1669 Inspection, 251; Putkowska 1991, 233). It indicates that the afore-mentioned church could have been a temporary, wooden temple.

The Church of the Brothers Hospitallers changed its location for different reasons. The order's monastery was founded in 1650 in the *jurydyka* of Leszno by its owner, Bogusław Leszczyński. The Brothers Hospitallers themselves decided to change its location and, after signing an agreement with Tobiasz Morsztyn, moved to a plot of land located on the road between Krakowskie Przedmieście and the Grzybów *jurydyka*. In return, the Hospitallers promised to build a family mausoleum within the new church. According to the literature on the subject, the construction of the church was to begin in 1665, but the inspectors did not register such a building in 1669. On the other hand, the construction was never completed. After Tobiasz Morsztyn's death, his brother, Jan Andrzej, became the sponsor, but when he was forced to flee Poland for political reasons, the construction stopped. In the first half of the eighteenth century, the Brothers Hospitallers were moved again and were granted new buildings (Putkowska 1991, 211-13).

Other churches and monastic complexes indicate greater permanence of the link between the location and the sacred space. It was not unknown in Warsaw for a monastery to be planned for one place and, for various reasons, change its location, and later, once it began operating, to become almost permanently attached to the latter location. The Discalced Carmelite Friars were to arrive in the town as early as in 1622, but their assigned plot of land ultimately became the site of the Franciscan Reformers' monastery. Eventually, the Friars came to Warsaw in 1637, and from 1639, they used a wooden chapel located next to the monastery. Although the church under construction was destroyed during the war, the Carmelites were still linked

to the same plot (Lorentz 1962, 27). The Piarists' history is similar. They were invited by King Ladislaus IV in 1642 and meant to settle in Nowa Warszawa. However, these plans were thwarted by the resistance of the local parish priest and the Jesuit order. Consequently, the Piarists were moved to Długa Street, where they temporarily moved into already existing wooden buildings. The plans for the expansion of the complex included an addition of a wooden church and a second, small, brick church dedicated to Saints Primus and Felician, patrons of the date of the king's birthday, whose relics were gifted to the monks by the ruler. Due to problems with the terrain, the construction of a brick church was very cost-intensive and was never completed. The last mention of the brick church comes from 1648 and indicates that the construction was in danger of falling apart. In 1646, however, a wooden church was put into use (Samsonowicz 1990, 92-6; Nowacki 1964, 771). Despite the complete destruction of the entire Piarist complex, the Piarists returned to their plot of land after the war, and reportedly started building a new brick church there in 1660 (Putkowska 1991, 209-10). As in the case of the Brothers Hospitallers, the 1669 Inspection does not mention any Piarist churches.

The Franciscans are the last example of an order moving its foundation site at an early stage. They were brought to Nowa Warszawa in 1646 on the initiative of members of the royal court of Ladislaus IV. They sold the plot they had originally received and bought a new one on the corner of Zakroczymska Street, where a church and a monastery were built in 1646 (Kałamajska-Saeed 2001, 25). After the war, the buildings were reconstructed on the same site, despite the destruction of the entire monastery complex. The fact that the Franciscan Church was the only wooden church in Nowa Warszawa facilitated its quick reconstruction. In this case, it is worth noting the interchangeability of successive buildings fulfilling the same function. The 1659 Inspection mentions a church that was rebuilt after the war, while the 1669 Inspection mentions two: the old one located deep within the plot and the new one located closer to the market square (the new one was mentioned twice in the inspection) (1669 Inspection, 221, 224). This stage of the history of Franciscan buildings is usually missing from the literature on the subject. The volume of *Katalog Zabytków Sztuki w Polsce* (Catalogue of Art Monuments in Poland) which describes this building provides information only about the construction of the church, its subsequent destruction, the construction of a new wooden church in 1662-63 (i.e. the second church mentioned in 1669) and its dismantling once a brick church was constructed after 1679 (Kałamajska-Saeed 2001, 25). The period in which two wooden Franciscan churches existed on that plot has been forgotten.

7 Methodological Comment

This begs the question: what makes it possible for certain buildings which exist in different periods to be classified as the same object? In our work on the ontology, we assumed that one such determinant is the ontology type – if it does not change, the object remains the same. This condition was met by the Warsaw churches before and after the Second Northern War and the type continuity was maintained. It should be noted that type is understood broadly. For example, after the Second Northern War, the Holy Spirit Church in Warsaw, previously under the patronage of the town council of Stara Warszawa, was in 1662 handed over by King John II Casimir to the Pauline Fathers for their services during the war (Kersten 1971, 68). This is also reflected in the inspections – in 1659, it is simply called the Church of the Holy Spirit, and in 1669, it is already referred to as the Church of the Holy Spirit of the Fathers of Częstochowa. However, this change did not affect the type (the church continued to function as a church although its affiliation changed), so the object remained the same.

The second important determinant is the location – if the type and location of objects are the same at different times, then they are classified as the same object. The example of the church, or rather churches, of the Warsaw Franciscans, shows that this requirement is not easy to fulfil. The Franciscan churches constitute several objects that inherit their function from one another and replace each other over time, which can also be traced in the database. This is a different approach than the one adopted by such publications as the Catalogue of Art Monuments in Poland series, where an existing building is the actual object, and the buildings that existed beforehand constitute, in a way, its variants. The object becomes an idea of sorts which is present in space through buildings existing at different times.

As for the destroyed church buildings reconstructed after the war, the continuity of the place was easier to maintain in the case of brick structures. The parish Church of the Blessed Virgin Mary and the Church of Bernardine Fathers in Krakowskie Przedmieście were burned down during the war, but their remaining walls were used during the restoration and extension of the buildings (Putkowska 1991, 190-2). However, in the case of destroyed wooden objects, it was easier to create a new object that inherited the functions of its predecessor in a slightly different place within the same plot of land. In the case of churches which were completely destroyed during the war, the list of objects which were reconstructed on the basis of the remains and represented a direct continuity of the object includes: the parish Church of the Blessed Virgin Mary, the Church of the Holy Spirit, the Church of the Bernardine Fathers and the Church of the Discalced Carmelite Friars. On the other hand, in the case of the Piarist Church, the Church of the Discalced Carmelite

Nuns, the Visitationist Church, and the Church of the Brothers Hospitallers, the buildings destroyed during the war were replaced with completely new ones.

Table 2 Own work

No.	Church	Objects before the war	Objects after the war
1	Parish Church of BVM	brick	brick
2	Franciscan Church	wooden	two new wooden ones
3	Church of the Holy Spirit	brick	brick
4	Piarist Church	a wooden one and a brick one under construction	new, brick
5	Church of the Bernardine Fathers	brick	brick
6	Church of the Discalced Carmelite Nuns	a brick one under construction	a new one, possibly wooden
7	Church of the Discalced Carmelite Friars	a brick one under construction	continuation of the construction of the brick church
8	Visitationist Church	wooden	new, brick
9	Church of the Brothers Hospitallers	wooden	the beginning of the construction of a new brick church

The next element of the description is the name of the object. It does not have to be constant – a given object may have different names at different times, and may also be called differently depending on the context or the person describing the space. For this reason, the database distinguishes between basic names, the official ones for given objects in a specific period, and secondary names, which are synonyms defining the object. The names of the churches appearing in the inspections of 1659 and 1669 refer mainly to the orders they served (hence the Jesuit Church or the Church of the Bernardine Sisters, etc.) without naming the church's *patrocinium*. There is one exception to this rule in the 1659 Inspection – the Church of St. Martin, which appears without reference to the Order of the Augustinian Hermits which in 1669 is already called the Church of the Augustinian Fathers. *Patrocinia* are provided mainly for parish churches and the Church of St. Benno which belonged to the St. Benno's Brotherhood. Hence, the Collegiate Church of St. John the Baptist is referred to as the Church of St. John in the inspections, and the parish church in Nowa Warszawa, as the Church of the Virgin Mary (1659) and the parochial (*farny*) Church of the Virgin Mary (1669). *Patrocinia* are also used in reference to churches whose origins or genealogy are older than the religious orders to which they were grant-

ed. This is the case of the parish Church of the Holy Cross, which derives from the sixteenth-century chapel of the same *patriocinium*, and which became the seat of the parish in 1627. In 1651, the Vincentians arrived in Warsaw in response to the invitation of Queen Marie Louise and took patronage over this church from the townspeople of Stara Warszawa (Putkowska 1991, 233; Nowacki 1964, 772). Nevertheless, in both inspections, the church is identified primarily by its *patrocinium*, and in the 1669 version, there was an additional reference to the fact that it belonged to the Vincentians. Moreover, the only reference to the size of the building which appeared in the 1669 Inspection concerned this very church, as it was referred to as a "small church" (*kościółek*) of the Holy Cross.

The Bridgettine Church was treated in a similar manner. In 1622, the Bridgettines settled near the existing municipal Chapel of the Holy Trinity, which they ultimately took over, and the church they built inherited the *patrocinium* from its predecessor (Borkowska 1997, 256-7; 2010, 321; Nowacki 1964, 776). Hence, in 1659, the church is referred to as the Holy Trinity Church, and the monastery as the monastery "of the Bridgettinne Ladies" (*pań brygidek*), while, in 1669, the whole complex is recorded as the Church and Monastery of St. Brigid, the Holy Trinity. The name of the afore-mentioned Church of the Holy Spirit was supplemented in 1669 with information about the Pauline Order and was recorded as the Church of the Holy Spirit of the Fathers of Częstochowa.

It is more difficult to determine who exactly invested in the reconstruction of Warsaw's churches during the reign of John II Casimir. More information is available for the later period, lasting until the end of the seventeenth century. Construction work was carried out throughout the period, expanding the existing churches and replacing wooden buildings with new brick ones. In the case of churches which belonged to religious orders, their post-war renewal depended mostly on the congregations and the resources they collected. In the case of the Franciscans, the construction of a brick church began in 1679, when the monks obtained funds from King Jan III Sobieski and Adam Kotowski, the pantler of Wyszogród (Putkowska 1991, 219). Similarly, the Bernardine Fathers could continue the reconstruction of the church after receiving financial support from the castellan of Wojnicz, Jan Wielopolski, in 1663 (Putkowska 1991, 191, 194; Murawiec 1973, 42-3). King Jan II Casimir provided financial support for the reconstruction of the Church of the Discalced Carmelite Friars (Lorentz 1962, 27-8, 33), and Queen Marie Louise provided aid to the Visitationists who helped them construct a new brick church in 1664 (Putkowska 1991, 233).

The townspeople's participation in the reconstruction efforts is noticeable primarily through the transfer of funds for the reconstruction of the parish Church of the Blessed Virgin Mary in Nowa War-

szawa, which lasted until around 1690 (Kałamajska-Saeed 2001, 2; Putkowska 1991, 190), the St. Benno's Brotherhood providing funds for the renovation of the Church of St. Benno (Kałamajska-Saeed 2001, 10; Mączyński 2008, 39-42), or financing a new bell and repair of the belfry at the Collegiate Church of St. John the Baptist, which was destroyed during the occupation (Przybyłek 2015, 271). The townspeople probably took part in collections conducted by various congregations, but the difficult post-war economic situation meant that their donations did not make a significant contribution to the reconstruction. The reconstruction of Warsaw churches was founded mainly by the ruling family and the representatives of the political elite who were the founders of various congregations.

8 Summary

The aim of the article was to check, based on the example of post war Warsaw, how the process of restoring churches in the urban space looked like and what was the impact of the extensive war damage on the continuity and durability of sacred urban space. The ecclesiastical topography of Warsaw, which was developed in the first half of the seventeenth century, proved to be extremely durable. There were 20 churches in Warsaw before the Second Northern War, including the ones which were still under construction. The ones which suffered the least damage were the three churches located within the town walls (the Collegiate Church of St. John the Baptist, the Augustinian Hermit Church, and the Jesuit Church) and the Church of the Holy Trinity of the Bridgettines, located on the town's periphery. Nine other churches were destroyed and four were severely damaged. There is no data about the condition of the two other churches. The reconstruction of the church infrastructure began almost immediately after the end of the hostilities. Thirteen churches are listed directly in the 1659 Inspection, and 17 are mentioned in the 1669 Inspection. Almost all churches have been restored on the plots of lands which are related to their original locations. The exceptions were: the Church and Monastery of the Discalced Carmelite Nuns, which were completely destroyed and moved by the founders to a completely new place, and the Monastery of the Brothers Hospitallers who, on their own initiative, moved closer to the centre of the town. In Warsaw, anchoring a church in a specific, permanent space was usually associated with the beginning of its operation. The order's arrival in the town could precede the choice of a place for their church or monastery. In the case of the Piarists, their chosen foundation site was contested and they moved to Długa Street, and the Franciscans decided to exchange the plot of land they had been given for another on their own. This persistent connection between specific places in the town

and the church buildings contrasts with the literature on the subject, which often included a view that ownership of secular plots underwent significant changes and the burghers' properties were taken over by the nobility (Bogucka 1984b, 190-3).

A similar process took place in Orléans after the end of the Huguenot rule. The restoration of the Catholic churches aimed not only to reconstruct the destroyed buildings, but also to return them to operation. After the period of destruction, the restoration of churches was also meant to symbolise the triumph of Catholicism and highlight its dominant role in the town and the state (Spicer 2007a, 268). Churches were not only places of worship, but also symbols of the domination of one religion, arriving after the period of unrest. In Warsaw, the church buildings emphasised the mono-confessional nature of the central town of the Polish-Lithuanian Commonwealth (at least in the context of build-up areas). Churches, as well as their construction and restoration, are inextricably linked with political and state events. The very restoration of the destroyed churches signified the triumph of Catholics over Protestants.

The continuity of functioning of individual churches was analysed in terms of the object description elements such as the type, location, and name of the object, which are used in the UrbanOnto ontology. No building which was classified as a "church" type before the war changed its type classification in the post-war period (if it still existed or was restored to operation). The churches destroyed during the war were treated in two ways: the buildings were either reconstructed in the same place using the remains of the original structures, which makes the pre-war and rebuilt objects the same, and maintains the continuity of the object, or they were replaced with new buildings (built on the same plot of land or in a completely different place) which inherited functions and names from their predecessors. It should be noted that the names could be unofficial ones, such as the Franciscan Church or the Carmelite Nuns Church. In this case, continuity is maintained by transferring the properties of the old church to a new building. The church names used in the discussed inceptions of 1659 and 1669 are predominantly meant to link churches and chapels to the correct order, which serves as their primary identification. The *patrocinia* are applied to churches other than monastery churches (parish churches, brotherhood's churches) or those that were granted to specific orders and whose *patrocinia* functioned for a long time as identifiers (such as the Church of the Holy Spirit which was given to the Paulines or the Chapel of Holy Trinity which was given to the Bridgettines).

The initiators of the reconstruction and expansion of churches were primarily the country's rulers and their families, as well as the noble elite and the orders themselves. Despite the war damage, these groups were able to collect funds to restore the destroyed or damaged church-

es to operation in the town space. The town, both the communes of Stara Warszawa and Nowa Warszawa and individual residents, did not play a significant role in these efforts, which is the result of economic and demographic devastation brought by the war. Although there are records of individual bequests left to parish churches in Stara Warszawa and Nowa Warszawa or people participating in collections for the reconstruction of specific churches, the financial needs related to the construction of the church exceeded the financial capacity of municipal communes and the town's residents. It is worth emphasising that there were no new church foundations in Warsaw in the post-war period during the rule of Jan II Casimir. The only royal initiatives related to changes in the church network in Warsaw were related to bringing new orders to already existing places of worship: the Pauline Fathers to the Church of the Holy Spirit and the Observant Dominicans to the Moscow Chapel (Nowacki 1964, 764). The example of Warsaw visualised that in the face of the extensive destruction of churches in the urban space, the most important thing was to recreate the state from the pre-war period, then to create new church buildings in new places and reorganise the sacred urban space.

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