NARRATE

Needs for Digital Recording and Documentation of Ecclesiastical Cultural Treasures in Monasteries and Temples

Project Information

Project Title:	Needs for Digital Recording and Documentation of Ecclesiastical Cultural Treasures in Monasteries and Temples
Programme/Action Type/Call:	ERASMUS+ / KA220-HED - Cooperation partnerships in higher education / 2022
Contract Number:	2022-1-EL01-KA220-HED-000089867
Start date:	29/12/2022
Duration in months:	24
Project Coordinator:	ARISTOTLE UNIVERSITY OF THESSALONIKI

The purpose of NARRATE project is to codify the actual recording and documentation needs for the ecclesiastical cultural treasures, through a systematic study of the users' needs.

Consortium partners

NARRATE

Needs for Digital Recording and Documentation of Ecclesiastical Cultural Treasures in Monasteries and Temples

Co-funded by the European Union

Contract no: 2022-1-EL01-KA220-HED-000089867

Document Information

Title	R2.1. Literature review of interdisciplinary approaches on religious cultural heritage documentation and preservation through new technologies.
Deliverable No.	R2.1.
Version	1.0
Type	☒Report ☐Demonstrator ☐ORDP ☐Ethics ☐Other
Work Package	WP2 Needs Analysis, Best Practice Collection and Conceptual Design of the NARRATE Framework
Work Package Leader	SOFIA UNIVERSITY ST KLEMENT OHRIDSKI
Issued by	INTERNATIONAL HELLENIC UNIVERSITY
Issued date	29/06/2023
Due date	29/06/2023
Dissemination Level	☒Public ☐Confidential

LEGAL NOTICE

The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Main Authors

Name	Organization
Konstantinos Evangelidis Stella Sylaiou Konstantinos Papatheodorou Uros Todorovic	INTERNATIONAL HELLENIC UNIVERSITY

Contributing Partners

Organization
ARISTOTLE UNIVERSITY OF THESSALONIKI
SOFIA UNIVERSITY ST KLEMENT OHRIDSKI
ASSOCIATION FOR THE PROTECTION OF CULTURAL HERITAGE (KMKD)
COGNITIVE UX

Co-funded by the European Union
Contract number: 2022-1-EL01-KA220-HED-000089867

Abbreviations

3D	Three-dimensional
AR	Augmented Reality
CH	Cultural Heritage
CIDOC-CRM	ICOM International Committee for Documentation-Conceptual Reference Model
EU	European Union
GIS	Geographic Information Systems
ICOM	International Council of Museums
ICOMOS	International Council of Monuments and Sites
TEI	The Text Encoding Initiative
UNESCO	United Nations Educational, Scientific and Cultural Organization
VR	Virtual Reality
ICT	Information and Communications Technology
PCDK	Promotion of Cultural Diversity
AAT	Art and Architecture Thesaurus
TGN	the Getty Thesaurus of Geographic Names
ULAN	Union List of Artist Na

Executive Summary

The EU Erasmus+ “NARRATE: Needs for Digital Recording and Documentation of Ecclesiastical Cultural Treasures in Monasteries and Temples” (2022-1-EL01-KA220-HED-000089867) aims at identifying and promoting the needs and priorities concerning ecclesiastical Cultural Heritage (CH) documentation.

The current study is being performed to codify the actual recording and documentation needs for the ecclesiastical cultural treasures, through a systematic study of the users’ needs. NARRATE reflects an emphasis on documenting ecclesiastic CH treasures in ways that will enable stakeholders to narrate their intertwined histories, functions, and spiritual importance throughout time.

In this report we provide the results of the R2.1 - *Literature review of interdisciplinary approaches on religious cultural heritage documentation and preservation through new technologies*, the first result of the Work Package n°2 - Needs Analysis, Best Practice Collection and Conceptual Design of the NARRATE Framework.

Table of contents

1. Interdisciplinary approaches on religious cultural heritage documentation and preservation through new technologies.

Interdisciplinary approaches to religious cultural heritage documentation and preservation through new technologies involve the integration of various fields and methodologies to effectively capture, document, and safeguard religious artifacts, sites, traditions, and practices. These approaches are connected with religious communication and technology [1] as well as the so-called digital religion [2]. By integrating these interdisciplinary approaches and technologies, religious cultural heritage can be documented, preserved, and made accessible to future generations while respecting its sacredness and cultural significance. These approaches leverage modern technologies to enhance the preservation, interpretation, and dissemination of religious cultural heritage.

1.1 Digital Documentation

Digital documentation techniques, such as 3D scanning, photogrammetry, and laser scanning, are used to create accurate and detailed digital representations of religious artifacts, buildings, and sites. These techniques capture precise measurements, textures, and colors, allowing for virtual preservation and reconstruction of damaged or destroyed heritage.

- **Photography:** High-resolution photography is employed to capture detailed images of religious artifacts, architectural elements, and sacred texts. Multiple angles and close-up shots help in capturing intricate details, textures, and colors [3].
- **3D Scanning:** 3D scanning technologies, such as laser scanning or structured light scanning, are used to create three-dimensional digital models of religious artifacts, sculptures, or architectural features. Laser scanning uses laser beams to measure the distance between the scanner and the object, creating a point cloud that represents the object's surface. This technique is particularly useful for capturing intricate details of sculptures, reliefs, or delicate artifacts. These

scanners capture millions of data points to generate accurate and realistic 3D representations [4]-[8].

- **Photogrammetry:** Photogrammetry involves capturing a series of overlapping photographs from different angles and processing them with specialized software to create 3D models. This technique is useful for capturing complex architectural structures, such as temples or churches [9], [10]. Digital documentation can be used to create virtual reconstructions of religious sites or structures that may have been damaged or lost. By combining the digital data with historical research, architectural knowledge, and artistic interpretations, virtual reconstructions offer immersive experiences of religious heritage.
- **Digital Archiving- Metadata and Annotation:** Once the digital documentation is complete, the data is organized and stored in digital archives. These archives can include high-resolution images, 3D models, metadata, and contextual information. Digital archiving ensures long-term preservation and accessibility of the documented religious heritage. Metadata, such as descriptions, classifications, and historical information, is attached to the digital documentation to provide context and facilitate searchability. Annotation tools enable scholars and experts to add additional information, interpretations, or notes to the digital records.
- **Online Platforms and Virtual Exhibitions:** Digital documentation allows for the creation of online platforms and virtual exhibitions, where users can explore and learn about religious artifacts, sites, and practices. These platforms provide interactive experiences, educational resources, and opportunities for global access and engagement.

1.2 Geographic Information Systems (GIS)

GIS technology is employed to map and analyze religious sites, pilgrimage routes, and cultural landscapes. By combining spatial data with other information, such as historical records, archaeological findings, and cultural practices, GIS aids in understanding the context and significance of religious heritage. It enables effective planning, management, and conservation strategies.

GIS can be used to create detailed maps of religious sites, including temples, churches, mosques, synagogues, and sacred natural sites [11]. These maps can

include information about their location, architectural features, historical significance, and associated rituals or practices. GIS enables the analysis of religious heritage within broader cultural landscapes. It helps identify the spatial relationships between religious sites, natural features, settlements, and other cultural elements [11].This analysis contributes to a deeper understanding of the interconnections between religious practices and the surrounding environment. GIS also assists in the conservation and management of religious heritage by identifying vulnerable or at-risk sites. It helps assess environmental factors, such as erosion, land-use changes, or natural disasters, that may impact religious sites. GIS can also support decision-making regarding buffer zones, land-use regulations, and conservation strategies [12], [13]. Furthermore, GIS technology facilitates the mapping and analysis of pilgrimage routes and networks. It allows for the identification of key pilgrimage sites, the visualization of pilgrimage paths, and the analysis of patterns, distances, and durations of pilgrimages [14]-[19]. GIS also aids in planning and managing infrastructure, facilities, and services along pilgrimage routes.

1.3 Augmented Reality (AR) and Virtual Reality (VR)

AR and VR technologies provide immersive experiences that allow users to explore and interact with virtual reconstructions of religious sites, artifacts, and rituals. These technologies facilitate education, interpretation, and virtual visits, especially for inaccessible or vulnerable sites. Users can experience religious heritage in a realistic and meaningful way, promoting cultural understanding and engagement. AR and VR can provide **virtual tours of religious sites**, allowing individuals to explore and experience sacred spaces remotely. Users can navigate through detailed 3D reconstructions of temples, churches, mosques, or other religious sites, immersing themselves in the architectural beauty, artwork, and ambience of these places. AR and VR technologies enable the reconstruction of historical religious sites that may no longer exist or have undergone significant changes. By combining archaeological data, historical records, and artistic representations, virtual reconstructions offer a glimpse into the past, allowing users to witness the grandeur and architectural details of ancient religious structures.

AR and VR applications can provide and present **contextual information, historical narratives, or cultural interpretations** while exploring religious heritage. Users can access multimedia content, including audio guides, visual annotations, or text overlays,

enhancing their understanding of religious rituals, symbolism, and historical significance associated with artifacts or sites. AR and VR offer interactive learning experiences for religious heritage education. Users can engage with virtual artifacts, manuscripts, or religious texts, examining them closely, and accessing additional information or multimedia content. These immersive experiences promote a deeper understanding of religious practices, beliefs, and cultural contexts. AR and VR can aid in the preservation and restoration of religious heritage. By creating digital archives of religious artifacts, artworks, or structures, these technologies can contribute to the documentation and conservation efforts. Digital replicas or virtual simulations assist in monitoring, planning, and simulating restoration projects.

There are pertinent articles and research that analyze how:

- the Church can use VR and AR and the ways these emerging technologies can be used to provide an intense cultural, historical, and religious visitor experience [20], [21].
- the Church can use the Metaverse [22]-[25].
- the emerging technologies can be used for religious education [26], [27].

1.4 Ethical Considerations

Interdisciplinary approaches should address ethical considerations associated with the use of new technologies in religious cultural heritage. Sensitivity to religious beliefs, practices, and cultural protocols is essential to avoid misappropriation or disrespectful use of religious artifacts, sites, or rituals. Collaboration with religious communities and experts ensures ethical guidelines and informed decision-making.

More specifically, there are several areas in which ensuring observance of ethical guidelines and respectful conduct of research related activities is of the utmost importance given the nature of the religious heritage domain. First and foremost, there must be Respect for Religious Sensibilities especially in handling sacred spaces, objects, relics, and artworks: Religious heritage is often deeply intertwined with sacred beliefs, rituals, and practices. When using ICT for documenting, digitizing, or disseminating religious heritage, it is crucial to respect the sensitivities and sacredness associated with the artifacts, sites, and traditions. Consultation and collaboration with religious communities, experts, and cultural authorities can help ensure that the use of

ICT aligns with religious protocols and values. Furthermore, involving shareholders in an adequate manner, by ensuring informed Consent is also vital. When involving individuals or communities in ICT projects related to religious heritage, obtaining informed consent is vital. Clearly explain the purpose, potential uses, and implications of the project, ensuring that participants understand and agree to the extent of their involvement. Consider the potential impact on privacy, cultural values, and religious practices when requesting and sharing information or images.

Moreover, rules, decrees and formal documents or agreements regarding the Ownership and establishing who is the custodian of sacred religious heritage is often, complicated and should be given due consideration before engaging in research that should observe and Intellectual Property rights. Therefore, researchers, clarify ownership and intellectual property rights when digitizing or reproducing religious artifacts, texts, or images using ICT. They should respect copyright laws, cultural protocols, and community ownership rights. Seeking appropriate permissions or licenses is imperative, and researchers should acknowledge the contributions of individuals or communities involved in the preservation or documentation process.

Research often puts emphasis on heritage items and sites, while the key beneficiaries are the public and thus, accessibility and inclusivity should be given proper attention when designing the ways individuals will engage with the outcomes of pertinent research. Researchers should therefore ensure that the use of ICT for religious heritage promotes accessibility and inclusivity and consider the diverse needs and capabilities of users, including those with disabilities or limited technological access. The development of platforms, interfaces, and content should be user-friendly, multilingual, and culturally sensitive to ensure broad participation and engagement.

In terms of accuracy and integrity, it is of the outmost importance that researchers do maintain the accuracy and integrity of digital representations of religious heritage. They must Ensure that digitized artifacts, sites, or practices are faithfully represented without misrepresentation or distortion. Clearly distinguishing between original artifacts and digital reproductions, in accordance with specified protocols and in accordance with best practices, will help audiences/users to avoid confusion or misinterpretation.

Moreover, safeguarding the digital data associated with religious heritage, including personal information, images, or research findings is also key, as Data Security and Privacy issues should be addressed properly. Researchers should thus adhere to best

practices for data security, storage, and transmission. They should also respect privacy rights and protect sensitive information, particularly when dealing with sacred texts, personal rituals, or sensitive cultural practices.

Last but not least, even new technologies should be employed with a view to safeguarding the longevity of the data and research results that accrue. So, in order to address the issues of Digital Preservation and Sustainability researchers should ensure the long-term preservation and sustainability of digitized religious heritage. Moreover, they should employ proper metadata standards, backup systems, and data migration strategies to prevent loss or degradation of digital assets. Finally, Considering the longevity and compatibility of digital formats to ensure continued access and usability over time, is key in order to preserve the results of their scientific work, and resolve any foreseeable interoperability issues.

2. Policy Documents, Guidelines & International Standards

2.1 Selected policy documents

- **UNESCO World Heritage Convention**[1]**.** The World Heritage Convention, administered by UNESCO, aims to identify, protect, and preserve cultural and natural heritage sites of outstanding universal value. It includes religious heritage sites such as ancient temples, churches, mosques, and pilgrimage routes. The convention provides guidelines and mechanisms for the identification, nomination, and conservation of religious heritage sites.
- **Intangible Cultural Heritage Policies**[2]. UNESCO's Convention for the Safeguarding of the Intangible Cultural Heritage recognizes the importance of intangible aspects of religious heritage, such as rituals, music, dance, and oral traditions. National and regional policies based on this convention aim to safeguard and promote intangible religious heritage through documentation, education, and community involvement.
- **ICOM Code of Ethics for Museums**[3] provides a framework for ethical documentation practices. These guidelines emphasize the importance of respect for cultural diversity, community engagement, and the ethical acquisition and documentation of religious artifacts. The code addresses various ethical considerations, including the following relevant to documentation:
    - *Acquisition and Disposal:* The code emphasizes responsible acquisition practices, ensuring that museums acquire objects through legal and ethical means. It encourages museums to consider the provenance and cultural significance of objects, including religious artifacts, before acquisition. Disposal should also be done ethically and responsibly,

[1] https://whc.unesco.org/en/convention
[2]https://ich.unesco.org/en/convention#:~:text=The%20%E2%80%9Cintangible%20cultural%20heritage%E2%80%9D%20means,part%20of%20their%20cultural%20heritage
[3] https://icom.museum/wp-content/uploads/2018/07/ICOM-code-En-web.pdf

respecting legal obligations and the interests of donors and communities.

- *Documentation and Research:* The code stresses the importance of accurate and comprehensive documentation of collections, including religious heritage. It encourages museums to undertake research, establish clear records, and make information accessible to the public. Documentation should respect privacy, confidentiality, and cultural sensitivities, especially concerning religious materials.
- *Authenticity and Integrity:* Museums should strive for authenticity and integrity in their collections and documentation. The code emphasizes the importance of conducting research, verifying authenticity, and providing accurate information about objects, including religious artifacts. Museums should also avoid misleading practices or misrepresentation of cultural heritage.
- *Respect for Cultural Diversity and Communities:* The code highlights the significance of respecting cultural diversity, religious beliefs, and practices. Museums should engage with communities associated with religious heritage, involve them in decision-making processes, and seek their input and collaboration in documentation and interpretation.
- *Access and Use:* The code promotes access to cultural heritage for all, including religious heritage, while respecting legal and ethical considerations. Museums are encouraged to make their collections and documentation accessible to the public, researchers, and communities, while also protecting sensitive information and ensuring appropriate use and handling of religious artifacts.

- **ICOMOS, Principles for the recording of monuments, groups of buildings and sites**[4]. The purpose of this document is therefore to set out the principal reasons, responsibilities, planning measures, contents, management and sharing considerations for the recording of the cultural heritage. The principles outlined in the document are intended to guide professionals involved in the recording and documentation of monuments, groups of buildings, and sites.

[4] https://www.icomos.org/en/charters-and-texts/179-articles-en-francais/ressources/charters-and-standards/387-principles-for-the-recording-of-monuments-groups-of-buildings-and-sites-1996

While it does not specifically focus on religious heritage, the principles are applicable to a wide range of cultural heritage, including religious sites. Some key points addressed in the document include:

- *Documentation Purposes:* The document highlights the importance of documentation for research, understanding, preservation, and dissemination of cultural heritage. It emphasizes that documentation should serve as a basis for decision-making processes, conservation measures, and public education.
- *Methodologies and Techniques:* The document encourages the use of appropriate methodologies and techniques for recording and documenting cultural heritage sites. It emphasizes the need for accurate measurement, comprehensive graphic and written documentation, and the integration of various data sources.
- *Multidisciplinary Approach:* The principles emphasize the importance of a multidisciplinary approach to documentation. Collaboration between architects, archaeologists, historians, conservation professionals, and other relevant experts is encouraged to ensure a holistic and comprehensive understanding of the cultural heritage site.
- *Contextual Understanding:* The document highlights the significance of documenting the context of cultural heritage sites, including their historical, social, cultural, and environmental aspects. It emphasizes that documentation should go beyond physical attributes and consider the broader cultural significance and values associated with the site.
- *Documentation Standards and Formats:* The document acknowledges the need for standardized documentation formats and metadata standards to facilitate interoperability and accessibility. It encourages the use of clear and consistent terminology and the integration of traditional and digital documentation techniques.
- *Preservation of Documentation:* The document emphasizes the importance of long-term preservation and accessibility of documentation. It recommends the establishment of appropriate archives, databases, and repositories for the storage and management of recorded information.

- **UNESCO Charter on the Preservation of Digital Heritage**[5]: emphasizes the importance of safeguarding digital materials for the benefit of present and future generations. It recognizes that digital heritage includes a wide range of content, such as texts, images, audio, video, and interactive applications. Some key principles and objectives of the charter include:
    - *Awareness and Collaboration:* Encouraging governments, institutions, and the public to be aware of the challenges of preserving digital heritage and to collaborate in its preservation efforts.
    - *Access and Usability:* Ensuring that digital heritage remains accessible and usable over time, taking into account technological, legal, and cultural factors.
    - *Preservation Strategies:* Developing comprehensive strategies for the long-term preservation of digital heritage, including the use of appropriate technologies, standards, and methodologies.
    - *Legal and Ethical Considerations:* Respecting legal and ethical norms, including intellectual property rights, privacy, and cultural sensitivity, when preserving and providing access to digital heritage.
    - *Capacity Building:* Promoting the development of skills and expertise necessary for the preservation and management of digital heritage, particularly in less-resourced regions.
    - *International Cooperation:* Encouraging international cooperation in the preservation of digital heritage, including sharing knowledge, resources, and best practices.

  The UNESCO Charter on the Preservation of Digital Heritage provides a framework for policymakers, institutions, and individuals involved in the preservation of digital heritage. It aims to raise awareness, guide decision-making processes, and foster international collaboration in this field.

[5] https://en.unesco.org/about-us/legal-affairs/charter-preservation-digital-heritage.In its analysis on the concept of digital heritage, UNESCO claims that digital heritage is made up of computer-based materials of enduring value that should be kept for future generations. Digital heritage emanates from different communities, industries, sectors and regions. Not all digital materials are of enduring value, but those that are require active preservation approaches if continuity of digital heritage is to be maintained

- **European Commission Recommendation on the digitization and online accessibility of cultural material and digital preservation**[6]: This Recommendation aims to encourage and guide EU member states in their efforts to digitize cultural material and make it accessible online while ensuring its long-term preservation. The Recommendation recognizes the potential of digital technologies for improving access to cultural heritage, promoting cultural diversity, and stimulating innovation. Some key points and objectives of the Recommendation include:
    - *Promoting the digitization of cultural material:* The Recommendation encourages member states to prioritize the digitization of cultural material, including books, manuscripts, artworks, photographs, audiovisual material, and archival documents.
    - *Enhancing online accessibility:* Member states are urged to ensure that digitized cultural material is made available online through user-friendly platforms, taking into account accessibility requirements for people with disabilities.
    - *Supporting interoperability and multilingualism:* The Recommendation emphasizes the importance of interoperability among digital cultural repositories and the provision of multilingual access to cultural content, promoting broader cross-border and cross-domain use.
    - *Ensuring digital preservation:* Member states are advised to establish strategies and frameworks for the long-term preservation of digital cultural material, including the use of metadata standards, technical formats, and preservation systems.
    - *Collaboration and exchange of good practices:* The Recommendation encourages member states to collaborate, exchange experiences, and share best practices in the digitization, online accessibility, and preservation of cultural material.
    - *Funding and financing mechanisms:* The Recommendation highlights the need for adequate funding and financial support to facilitate digitization initiatives and the sustainable operation of digital repositories.

[6] https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:283:0039:0045:EN:PDF

The 2011 Recommendation provides guidance to member states but does not impose legally binding obligations. However, it serves as a framework for member states to develop their own strategies, policies, and initiatives related to the digitization, online accessibility, and digital preservation of cultural material.

- **Getty Conservation Institute Recording, Documentation, and Information Management for the Conservation of Heritage Places Guiding Principles**[7]: by Robin Letellier (and contributions from Werner Schmid and François LeBlanc). It provides a comprehensive overview of the fundamental principles and guidelines for documenting cultural heritage places. It seeks to aid heritage managers and decision makers in understanding their roles and responsibilities in this essential activity. It acknowledges the work by international organizations such as ICOMOS and the World Heritage Center in this field and adds to their efforts by offering arguments and a framework for integrating documentation into the conservation process. The section on effective documentation and information management offers new concepts and ideas to advance the field. The glossary and annotated selected bibliography will help the reader to further explore this important subject.
- **Guidelines on Cultural Heritage. Technical tools for heritage conservation and management**[8], JP - EU/CoE Support to the Promotion of Cultural Diversity (PCDK). It provides information about possible contents of an inventory of immovable cultural heritage assets.

2.2 International standards

- **CIDOC-CRM**[9]**:** Information and documentation: a reference ontology for the interchange of cultural heritage information (ISO 21127:2006) by International Organization for Standardization (2006), Geneva: International Organization for Standardization. It is widely used and developed by the International Council of Museums (ICOM), is an ontological framework for the documentation of cultural

[7]https://www.getty.edu/conservation/publications_resources/pdf_publications/pdf/guiding_principles.pdf
[8] https://rm.coe.int/16806ae4a9
[9] https://cidoc-crm.org

heritage objects. It provides a common language and structure for describing the relationships between objects, events, and actors in a cultural heritage context. CIDOC-CRM can be applied to religious artifacts and their associated information.

- **SPECTRUM**[10]: The SPECTRUM standard, developed by Collections Trust, provides a framework for managing collections, including religious artifacts and objects. It covers various aspects of documentation, including object identification, description, condition assessment, and location tracking. SPECTRUM is widely used in the museum and heritage sector.
- **TEI**[11]: The Text Encoding Initiative is an XML-based standard for encoding and exchanging textual information. It provides guidelines for marking up and describing various types of text, including religious texts, inscriptions, and manuscripts. TEI allows for detailed transcription, annotation, and analysis of religious texts and supports interoperability between digital projects.
- **Getty Vocabulary Programs**[12]: The Getty Vocabulary Programs offer standardized vocabularies and thesauri for describing art, architecture, and cultural heritage objects. They include the Art and Architecture Thesaurus (AAT), the Getty Thesaurus of Geographic Names (TGN), and the Union List of Artist Names (ULAN). These vocabularies can assist in providing consistent and controlled terminology for documenting religious artworks, architectural elements, and geographical locations.
- **Arches**[13]**:** Arches is an open-source software platform specifically designed for cultural heritage inventory and management. It incorporates international standards such as CIDOC-CRM and supports the documentation of religious heritage, including sites, monuments, and artifacts. Arches provides a flexible and customizable framework for capturing and sharing religious heritage information.

[10] https://collectionstrust.org.uk/spectrum
[11] https://tei-c.org/
[12] https://www.getty.edu/research/tools/vocabularies
[13] https://www.archesproject.org

3. Conclusions

When documenting religious heritage, it is essential to follow certain guidelines to ensure comprehensive and accurate documentation. Here are some guidelines that we propose for the documentation of religious heritage:

- **Object Identification:** Assign a unique identifier to each religious artifact or object to facilitate its identification and tracking throughout the documentation process.
- **Description and Cataloging:** Provide detailed descriptions of the religious artifacts, including their physical characteristics, materials, dimensions, inscriptions, and any associated rituals or cultural significance. Use standardized terminology and vocabulary when describing the objects.
- **Provenance and History:** Research and document the object's provenance, including its origin, acquisition history, and ownership chain. Record any significant historical events, cultural practices, or rituals associated with the object.
- **Visual Documentation:** Capture high-quality photographs of the religious artifacts from multiple angles to document their visual appearance, details, and condition. Use proper lighting and color calibration techniques to ensure accurate representation.
- **Measurements and Material Analysis:** Record precise measurements of the objects, including height, width, and weight. Consider conducting material analysis to determine the composition, age, and deterioration factors of the artifacts.
- **Conservation and Condition Assessment:** Document the conservation history, treatment, and current condition of the religious objects. Include information about any damage, deterioration, or restoration work that has been done.
- **Contextual Information:** Provide contextual information about the religious artifacts, such as their original purpose, cultural or religious significance, and their role within specific rituals or ceremonies. Include narratives, myths, or legends associated with the objects if available.

- **Digital Documentation:** Utilize digital tools and databases to store and manage the documentation of religious heritage. Use appropriate metadata standards to ensure consistency and interoperability of data. Consider creating 3D models or virtual representations of the artifacts for enhanced documentation and visualization.
- **Legal and Ethical Considerations:** Adhere to legal and ethical guidelines when documenting religious heritage, including obtaining proper permissions for access, photography, or publication. Respect religious sensitivities, cultural protocols, and intellectual property rights.
- **Collaboration and Community Involvement:** Involve religious communities, experts, scholars, and stakeholders in the documentation process. Seek their input, insights, and knowledge to ensure accurate representation and interpretation of the religious artifacts.
- **Access and Dissemination:** Ensure that the documented information is accessible to researchers, scholars, and the general public. Consider publishing the documentation in digital archives, online platforms, or scholarly publications to facilitate wider access and understanding of the religious heritage.

These guidelines provide a framework for documenting religious heritage, but it's important to adapt them to the specific cultural, religious, and regional contexts in which the documentation takes place. Working collaboratively with religious communities and experts is crucial to capturing the nuanced and authentic aspects of religious heritage.

4. References

[1] Campbell, H. A. (2017). Religious communication and technology. In Annals of the International Communication Association (Vol. 41, Issues 3–4, pp. 228–234). Informa UK Limited. https://doi.org/10.1080/23808985.2017.1374200

[2] Campbell, H. A., & Evolvi, G. (2019). Contextualizing current digital religion research on emerging technologies. In Human Behavior and Emerging Technologies (Vol. 2, Issue 1, pp. 5–17). Hindawi Limited. https://doi.org/10.1002/hbe2.149

[3] Beck, L. S. (2013). Digital Documentation In The Conservation Of Cultural Heritage: Finding The Practical In Best Practice. In The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences: Vol. XL-5/W2 (pp. 85–90). Copernicus GmbH. https://doi.org/10.5194/isprsarchives-xl-5-w2-85-2013,

[4] Schaich, M. (2007). From 3D Scanning to Analytical Heritage Documentation. In: Nimmrichter, J., Kautek, W., Schreiner, M. (eds) Lasers in the Conservation of Artworks. Springer proceedings in physics, vol 116. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-540-72130-7_55

[5] Rüther, H., Bhurtha, R., Held, C., Schröder, R., & Wessels, S. (2012). Laser Scanning in Heritage Documentation. In Photogrammetric Engineering & Remote Sensing (Vol. 78, Issue 4, pp. 309–316). American Society for Photogrammetry and Remote Sensing. https://doi.org/10.14358/pers.78.4.309

[6] Gautier, Q.K., Garrison, T.G., Rushton, F., Bouck, N., Lo, E., Tueller, P., Schurgers, C. and Kastner, R. (2020), "Low-cost 3D scanning systems for cultural heritage documentation", Journal of Cultural Heritage Management and Sustainable Development, Vol. 10 No. 4, pp. 437-455. https://doi.org/10.1108/JCHMSD-03-2020-0032

[7] Agosto, E., Ardissone, P., Bornaz, L., & Dago, F. (2020). 3D Documentation of Cultural Heritage. In Applying Innovative Technologies in Heritage Science (pp. 1–15). IGI Global. https://doi.org/10.4018/978-1-7998-2871-6.ch001

[8] Siu, S. L. K. (2021). Application of 3d Scanning Technology ın Restoration of Heritage Site Damaged by Natural Disaster. In The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences: Vol. XLVI-

M-1–2021 (pp. 685–691). Copernicus GmbH. https://doi.org/10.5194/isprs-archives-xlvi-m-1-2021-685-2021.

[9] Themistocleous, K., Mettas, C., Evagorou, E., & Hadjimitsis, D. G. (2019). The use of UAVs and photogrammetry for the documentation of cultural heritage monuments: the case study of the churches in Cyprus. In K. Schulz, K. G. Nikolakopoulos, & U. Michel (Eds.), Earth Resources and Environmental Remote Sensing/GIS Applications X. SPIE. https://doi.org/10.1117/12.2533056

[10] Llerena-Izquierdo, J., Cedeño-Gonzabay, L. (2020). Photogrammetry and Augmented Reality to Promote the Religious Cultural Heritage of San Pedro Cathedral in Guayaquil, Ecuador. In: Botto-Tobar, M., Zambrano Vizuete, M., Torres-Carrión, P., Montes León, S., Pizarro Vásquez, G., Durakovic, B. (eds) Applied Technologies. ICAT 2019. Communications in Computer and Information Science, vol 1194. Springer, Cham. https://doi.org/10.1007/978-3-030-42520-3_47

[11] Cozma, I., Federici, A., Giorda, M. C., & Omenetto, S. (2023). From Secular Spaces to Religious Places: The Case of the Romanian Orthodox Place of Worship of Lunghezza (Rome, Italy). In Religions (Vol. 14, Issue 1, p. 100). MDPI AG. https://doi.org/10.3390/rel14010100

[12] Box P., GIS and cultural research management: A manual for heritage managers, https://unesdoc.unesco.org/ark:/48223/pf0000116270

[13] Xiao, W., Mills, J., Guidi, G., Rodríguez-Gonzálvez, P., Gonizzi Barsanti, S., & González-Aguilera, D. (2018). Geoinformatics for the conservation and promotion of cultural heritage in support of the UN Sustainable Development Goals. In ISPRS Journal of Photogrammetry and Remote Sensing (Vol. 142, pp. 389–406). Elsevier BV. https://doi.org/10.1016/j.isprsjprs.2018.01.001

[14] Mapping the Way of St. James: GIS Technology, Spatial History, and the MiddleAges,https://www.arcgis.com/apps/View/index.html?appid=686ab9f3f4924c1ab3ce68e40744b73d

[15] Pilgrim paths, https://data.gov.ie/dataset/pilgrim-paths

[16] Boukouvalas, L., Grigorakakis, G., & Tsatsaris, A. (2018). Cultural Routes in Kynouria of Arcadia: Geospatial Database Design and Software Development for Web Mapping of the Spatio-Historical Information. In Heritage (Vol. 1, Issue 1, p. 10). MDPI AG. https://doi.org/10.3390/heritage1010010

[17] Planning Your Pilgrimage: The Way of St. Jameshttps://lbsc650.weebly.com/gis-sources.html

[18] The Camino de Santiago, https://storymaps.arcgis.com/stories/9950520ddff343149e59f8e3a45b5c99

[19] Camino Routes, https://followthecamino.com/en/camino-de-santiago-routes/

[20] Allal-Chérif, O. (2022). Intelligent cathedrals: Using augmented reality, virtual reality, and artificial intelligence to provide an intense cultural, historical, and religious visitor experience. In Technological Forecasting and Social Change (Vol. 178, p. 121604). Elsevier BV. https://doi.org/10.1016/j.techfore.2022.121604

[21] Strapping on the Sacred: When Religion Enters Virtual Reality, https://archinect.com/features/article/149982444/strapping-on-the-sacred-when-religion-enters-virtual-reality

[22] Jun, G. (2020). Virtual Reality Church as a New Mission Frontier in the Metaverse: Exploring Theological Controversies and Missional Potential of Virtual Reality Church. In Transformation: An International Journal of Holistic Mission Studies (Vol. 37, Issue 4, pp. 297–305). SAGE Publications. https://doi.org/10.1177/0265378820963155

[23] VR Church in the Metaverse, https://www.vrchurch.org/

[24] God has entered the metaverse - and faith in the virtual world is flourishing, https://www.euronews.com/next/2022/02/01/god-has-entered-the-metaverse-and-worship-in-virtual-worlds-is-booming

[25] Why a growing number of Americans are choosing to worship in virtual reality, https://www.abc.net.au/news/2022-02-01/faith-metaverse-virtual-reality-church-service/100794466.

[26] Johnson, C. D. L. (2018). Using virtual reality and 360-degree video in the religious studies classroom: An experiment. In Teaching Theology & Religion (Vol. 21, Issue 3, pp. 228–241). Wiley. https://doi.org/10.1111/teth.12446

[27] School VR Subjects: Religious Education Resources, https://www.classvr.com/vr-ar-resources/religious-education-vr-teaching-resources/