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DIGITIZATION AND DOCUMENTATION OF URBAN HERITAGE USING DIGITAL TECHNOLOGIES

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Abstract
This study examines the challenges facing urban heritage, represented by human factors such as urbanization, urban expansion, neglect, conflicts and wars, and natural factors such as earthquakes and floods, with an analysis focusing on the old Rusafa area in Baghdad, which is rich in cultural heritage and currently suffers from many dangers. The challenge lies in confronting these risks and preserving heritage.
This research provides a comprehensive exploration of the key influences, methodologies, results, and conclusions related to the preservation of the cultural heritage of the ancient region amidst these challenges. Drawing on a mixed-methods approach that includes expert surveys, thematic analysis, and case studies, this study identifies a consensus among scholars and practitioners about the risks posed by current challenges to cultural heritage. Despite the diversity of opinions regarding the entry of digital technology into the field of heritage, there is now a strong consensus regarding the use of digital technologies in documenting cultural heritage, and the main results indicate that heritage is one of the fields that has had a noticeable benefit in digital transformation, and to ensure the long-term sustainability of heritage without being exposed to various factors, documentation is the first step in protecting urban heritage using various techniques. A database is created as a result of the documentation process, which is the basic stage in the protection and dissemination of final information in the media for tourism, with the possibility of collaboration between the public and private sectors to conduct documentation. He emphasizes research on the role of technology in diagnosing and recording heritage to preserve it, enjoy it, and pass it on to current and future generations

Keywords: Digital technologies, Documentation, GIS, Historical Building Information Modeling (HBIM), LIDAR.

1. Introduction
Heritage is a cultural wealth for every nation that reflects its history and originality, and from this concept, people and international organizations begin to search for this concept and how to preserve it through international agreements, conferences, and charters that call for the preservation of human heritage in genera (Soliman and Mustafa, 2012), and it represents a continuation of what is inherited by children and grandchildren from their fathers and grandfathers, meaning that it is a starting point towards the future(Sayed, 2010). Urban heritage represents a social, economic, and cultural asset and resource and consists of architectural components (buildings and monuments) as well as urban features (open and green areas, built form, and urban infrastructure) (United Nations, 2015).

The establishment of self-identity and nationalism in the globalization era and the fast-paced consumer

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society of today depends on the ability to recognize and understand historical details and cultural values ingrained in a nation's cultural heritage. Because of this, many nations have elevated the protection of cultural heritage from "state action" to "national strategy," which has resulted in a revolution in all traditional industries and a drastic change in how people communicate and disseminate knowledge as a result of recent scientific and technological advancementsV (He, Ma and Zhang, 2017) .

Beyond the bounds of conventional heritage protection, new digital information technologies offer potent tools for heritage designation, protection, display, and communication that could potentially resolve a number of contemporary issues pertaining to the preservation of monuments and sites. But this necessitates a fundamental shift in our understanding of how we utilize cultural heritage and poses vital concerns for further research and development in this area, such as "How should we approach the relationship between heritage protection and use"? How do we assess and evaluate suitable technologies? What services does technology offer the historical record? In general, how do you offer the service? How can we innovate this service? These questions have fairly complicated answers, yet they all stem from the same straightforward idea: we must return to the original idea of preserving monuments and sites (China, 2016) .

Digital technologies refer to the use of digital technology to improve processes and develop products and services, and digital technologies include a variety of tools and technologies such as artificial intelligence, cloud computing, the Internet of Things, big data analysis, virtual reality, and augmented reality. These technologies play a vital role in improving efficiency and saving time and resources in various fields. New terms have emerged as a result of the collective use of digital technologies at the beginning of the twenty-first century, including digital heritage, digital humanities, and digital organization. Digital technologies play a crucial part in the field of heritage preservation and provide wider access for the public to learn about cultural heritage. Digital technologies in general also contribute to protecting and enhancing cultural heritage and making it available to everyone in innovative and exciting ways (Sotirova et al., 1972).

2.1. problem Statement

With modern developments and the increasing challenges facing urban heritage, such as migration, urban expansion, wars, and conflicts that negatively affect historical resources and heritage sites, the need to document heritage is increasing as a precautionary measure to ward off risks and provide a digital archive record that can be referred to for the purposes of restoration, maintenance, monitoring, and management, as well as for the purposes of.to keep pace with developments in Tourism and science, digital technology has emerged and has spread increasingly in many fields, including heritage, where the need has emerged to integrate it within this era, which is called the digital age, to ensure its efficient management. The documentation process is the first stage of management, and from here the research problem ends. The lack of clarity, function, and potential of digital technologies in the documentation process, especially among non-specialists, is due to the relative newness of the field, especially in developing countries, which possess an enormous cultural heritage, which requires exploiting all means to preserve and document it for future generations.

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2.2. Research objectives

The research aims to shed light on digital technologies and their function in documenting and digitizing heritage, identify their potential at every stage of documentation, and rely on them later in formulating broad outlines for the controls of the documentation process. This is done by first identifying digital heritage and the importance of digitizing heritage and clarifying the concept of documentation in preparation for reviewing digital technologies and their functions at each stage of documentation, so that these stages are the basic guide to the capabilities of digital technologies.

Theoretical Framework

2.1. Digital Heritage

A novel idea arising in the digital age, digital heritage is described as resources obtained for informational and knowledge-seeking purposes through information and communication technology (ICT) instruments. Resources related to digital legacy can be found in writings, photos, music, software, databases, artwork, and more. The preservation of local and regional heritage against causes that contribute to its loss is made possible in large part by the digitalization of such assets. Furthermore, this procedure facilitates information exchange and opens it up to people and cultures around the world (Economou, 2015).

Digital heritage is defined as "computing (digital) resources of lasting historical and cultural value that should be preserved for future generations" in the "Charter for the Preservation of Digital Heritage" published by UNESCO in 2003 (United Nations Educational, 2003). Digital heritage, which is shared material that the general public uses, is anticipated to grow in significance and prevalence over time. Even if the original is digital, it still needs to be safeguarded and maintained. With impressive outcomes, digital technology has been extensively employed in cultural heritage site management, research, communication, and protection since the 1990s (Wu, Wang and Dai, 2006).

The main advantage of digital heritage is to transfer heritage from its physical, analogue form to its electronic or digital form so that it can be easily managed, maintained, stored, accessed, and shared among stakeholders and end-users. Heritage in its physical form is obtained using ICT tools in physical form and converted directly into digital form (Sullivan, 2015). Computer-based processing can also be applied to digital heritage for improved management and other purposes. With advances in ICT tools, it is now possible to easily view, manage, and tour heritage remotely without being physically there, which means digital heritage has transformed the way that natural and cultural heritage are managed Fig .11 (Mukhopadhyay et al., 2020) .

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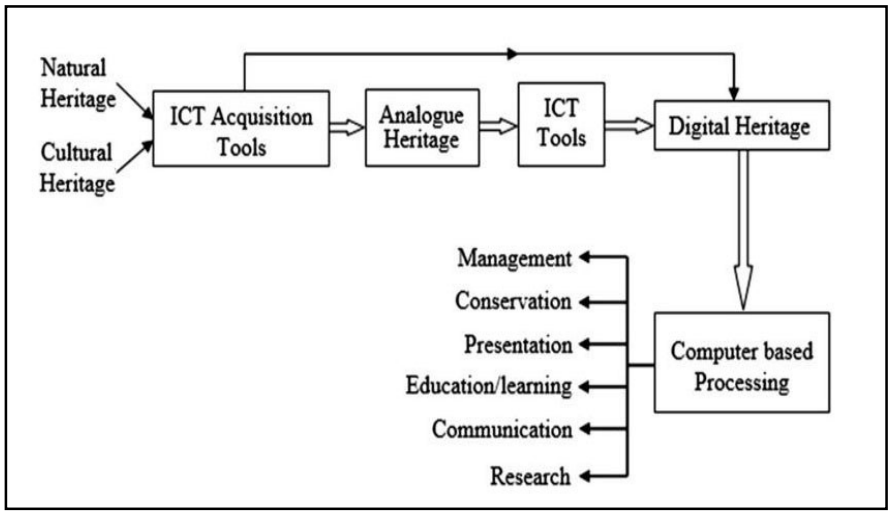

Figure1.Digital Heritage System

2.2. The importance of digitizing urban heritage

Digitization is an effective means of preserving valuable information, especially in its traditional (paper) state or in the event that the heritage site exists in reality and is in a deteriorated condition, making it difficult for the beneficiaries to access it. Therefore, digitization works to eliminate or reduce the return to the original source due to the presence of a copy. An alternative electronic form that beneficiaries can refer to. Sources can also be shared, as the digital source can be used by several people or beneficiaries at the same time, thus overcoming the problem of not having enough copies of the sources (Sayed, 2021). In addition, it provides the possibility of providing sources remotely (via the information network system) and easy searching for them, as they are arranged either according to the region, the subject, the person, or the chronology, and this feature is not available in traditional manual methods. Digitization in general in this aspect works to maintain accurate records of historical and cultural monuments, which contributes to their preservation for the future (Dalbera, 2000).

Digitization also represents the most important means at the present time for providing protection and safety for heritage and historical areas, as well as conservation areas in general. By digitizing heritage sites, safety measures can be implemented to safeguard the site from damage or danger, such as automated communication systems, sensors, and graphic analysis to predict emergency situations and provide early warning. reduces the risk of disasters and thus enables the crisis to be managed efficiently and effectively (Demas, 2002). The digitization of heritage is the basic step in moving from local tourism to global tourism, especially in the event of the existence of a common heritage stock with historical and cultural dimensions shared by a specific civilization that existed geographically in various countries of the world, which helps in digitally promoting the common local and global heritage through smartphone applications and immersive technologies. Or websites. Through these digital measures, it is possible to raise the level of awareness of heritage and culture and encourage tourists to visit the sites. Digitization also helps in this aspect by providing access to heritage sites for everyone, especially for people who cannot reach them geographically (Al-muhrzi and Al-Azri, 2019).

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2.3. Documentation

The documentation process is one of the important procedures that guarantees the protection of historical sites, regions, and neighborhoods, including buildings and heritage landmarks. This process is characterized by being an identification card with detailed information for the site, region, or building in terms of data, history, and original and current condition. It is based on a complete understanding and study of the conditions of the region. Or the building. The process of documenting urban areas, neighborhoods, and buildings before technology was carried out manually and by traditional methods, such as photography and hand drawing. This process was laborious and required a long time, in addition to being inaccurate. It was conducted by documentarians, architects, and planners as they toured the neighborhoods. And areas to draw streets, landmarks, and prominent buildings using manual methods, namely traditional cameras, and then the images are developed using chemicals. As for the development of technology, new methods of image processing have emerged that rely on computers and software for processing digital images. Advanced algorithms and techniques are used to analyze and process images quickly and efficiently. Thanks to these techniques, it has become possible to edit and modify images easily, in addition to obtaining more accurate and clear results (Scherer, 2002).

2.4. Techniques used in documenting urban areas

Digital technology has provided many possibilities that can be exploited in the field of heritage, whether at the hardware, equipment, or software level (Al-Sherbiny and khaled, 2013). Here are the techniques employed during the documentation stages:

2.4.1. Detection stage

The process refers to the discovery and identification of sites that hold important historical or cultural value, and the main goal of uncovering sites is to preserve and document them.

Table 1 shown the Detection stage technology

Technique	Possibility
lidar It is a technology that relies on the use of laser beams to measure distances, or remote sensing. Lidar is used in various fields, including geological drawing to draw three-dimensional DEM maps of the Earth, terrain and water analysis, remote sensing to analyze environmental changes, and aerial surveying to draw three-dimensional models of cities and buildings Dimensions (Fernández-Toribio, 2013) .One of its most prominent features is its precise measurements that reach a centimeter and reach critical points, especially sites densely populated with plants, which no other technology can reach (Canuto et al., 2018).	Aerial detection

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2.4.2. Documentation stage

In this process, detailed information is collected, resulting in a set of documents such as photographs, drawings, and records covering a smaller area and focusing more on details.

Table 2 shown the documentation stage technology

Technique	Possibility
Drones or UAVs Use for monitoring forest fires and rivers, inspecting infrastructure and providing great possibilities for photography from the air in an effective and simple way, controlled remotely, giving the possibility of aerial photography at low distances to contribute to obtaining aerial images with high accuracy and at various angles. It is also possible to record video during which (Shim, 2016).	Photography
Laser scanner its work depends on sending laser beams and monitoring their reflection from the observed object with high speed and accuracy to provide the possibility of obtaining three-dimensional point cloud models of structures and buildings, which are then entered into programs to process color and texture (Al-Sherbiny and Khaled 2013).	3D photogrammetry
lidar Lidar was mentioned in the site detection phase, but it can also be used in the documentation phase, especially in the case of a site with a large area and high altitude to obtain a 3D model and three-dimensional terrain.	

2.4.3. Database creation stage

The task of building a database for metropolitan places comes after the documentation stage, and it is thought to be essential for maintaining the documentation and data gathered about these locations

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Table 3 shown the database stage technology

Technique	Possibility
Historical Building Information Modeling (HBIM) This program is at the architectural level, as it combines CAD engineering drawing programs, simulation programs, and design and analysis programs at the same time, giving the possibility of organizing the main data and information of the building or site with high efficiency by forming an integrated three-dimensional model that contains all the architectural elements and systems. And the structural information contained in the site or building, with descriptive data as well (Jordan-Palomar et al., 2018).	Create database at an architectural level
Geographic information systems (GIS) In recent years, this system has become one of the most important tools in the field of urban planning, as a result of its efficiency in storing, analyzing, and interpreting geographical data. It is used in a range of applications such as geology, environment (analyzing changes in vegetation), and urban planning. Its importance can be included in the field of documenting historical areas through the preparation of aerial maps of urban areas, the possibility of integrating descriptive data for the region with aerial maps, and the formation of a digital archive as an alternative to paper records to be safer and easier to transport (Badr, 2016).	Create database at an urban level

1. Research Methodology

This study adopted a mixed-methods approach. Quantitative and qualitative data were combined to explore the potential of digital technologies for documenting heritage areas. 60 experts in the fields of architecture, urban planning, and archeology, in addition to decision-makers, participated in the research to ensure a comprehensive understanding of the issue of heritage digitization and preservation.

Sample selection: The sample included 60 experts who were selected through sampling that included a variety of experiences related to the objectives of the study.

Data Collection: The questionnaire was distributed in June 2024 via email and professional networks to tap into a well-connected community of experts on relevant topics, and the process was designed to be clear, accessible, and encourage thoughtful responses by participants. Data were collected according to a Likert format starting with strongly disagree to strongly agree, and a 5-point Likert scale allowed for an accurate understanding of experts' opinions about the potential of digital technologies in documenting heritage.

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Data analysis: The responses resulting from the questionnaire were analyzed quantitatively to interpret the answers based on a Likert scale. The analysis focused on identifying agreement and patterns among the opinions of experts, which provides a clear picture of the collective point of view on the topic.

Ethical considerations: Ethical standards were strictly maintained throughout the study, as participants were informed of the research objectives, their consents to participate were obtained, and the confidentiality of responses was ensured to maintain the integrity of the research process.

Methodological rigor: This methodology, with its focus on expert opinions and structured data collection using a Likert scale, provided a strong framework for understanding the nuanced aspects of the importance of digital technologies in heritage documentation, as viewed by experts in the fields of architecture and urban planning. The precise nature of the questions and the systematic analysis of the answers ensured that the results were reliable.

2. Description of the study area (Old Rusafa)

The history of the city of Baghdad, which extends for more than a thousand years, has made it rich in the heritage of civilizations and antiquities, and most of the historical monuments are gathered in the old city center (Al-Rusafa) [23].The city of Baghdad includes many important landmarks of authenticity and historical dimension, and the urban developments that the city went through in previous historical periods gave it features through which it tried to preserve its authenticity and identity (Hamdan, 2015) Fig .2 Fig .3 (Al-Saffar, 2018).

Old Rusafa is in the historical center of organism. The area of Rusafa covered by the wall was about 5.4 kilometers, and its population was 203,000 people in 1980 AD. Rusafa currently forms a shrinking mixture. Of population density. The irregular traditional fabric and modern developments often conflict with each other in form, size, and function. The importance of ancient Rusafa is not only of local dimensions but also of regional and national dimensions. It contains the largest concentrations of traditional markets, workshops, some mosques, and governmental and administrative buildings in Iraq. There are many important historical buildings, some of which date back to the Abbasid era and some of which date back to the Ottoman era, so it is an important heritage that requires urgent protection for its historical identity(Al-Saffar, 2018).
The historic center suffered from problems such as the destruction of many buildings and the deterioration of the traditional urban fabric (Yung and Chan, 2012) , Among the challenges facing old Rusafa is the process of change in the old city center through uncontrolled and uncontrolled modernization processes, as well as the rapid extinction of the historical area through the uncontrolled spread of commercial markets at the expense of the historical urban fabric, the deterioration of old residential areas, conflicts, wars, and security disturbances that. Iraq has witnessed since 1980 and for more than three decades a devastating impact on the old city, and the looting and destruction operations during the American occupation in 2003 caused the distortion of many heritage buildings, so they lost their landmarks and characteristics, in addition to the terrorist operations that caused the demolition and

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burning of the urban heritage, so it disappeared from existence.The threats of these challenges to the urban heritage are escalating in the center of the old city, which is full of urban landmarks and was the center of the Abbasid Caliphate and a source of knowledge and generosity (Al-Waeli, 2017).

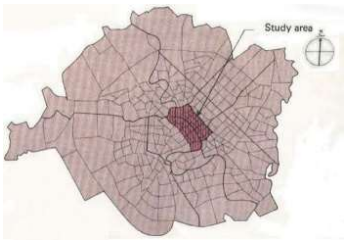

Figure 2: Old Rusafa in Baghdad, Iraq

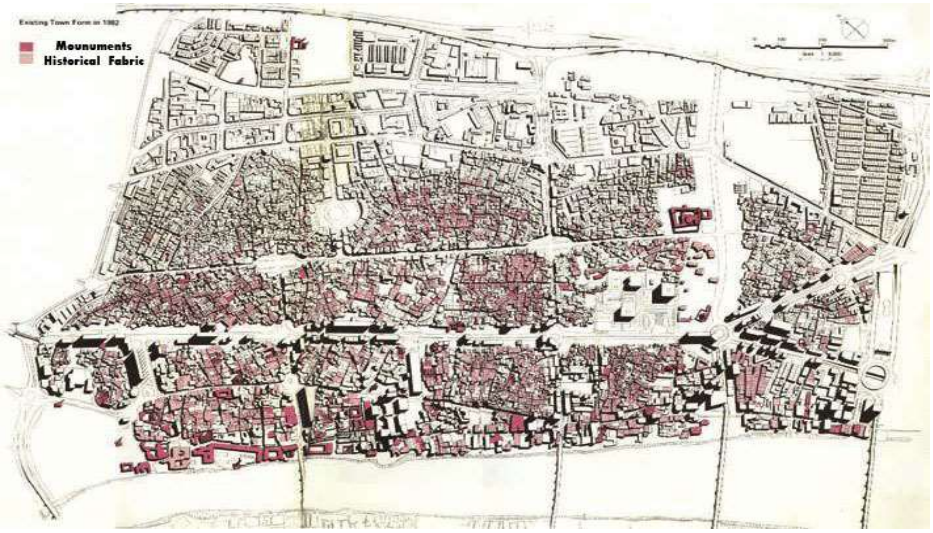

Figure 3: The old fabric and Mounuments in (Old Rusafa)

3. Findings

This section highlights the nuanced insights and perspectives gathered from the structured survey, which have been rigorously analyzed to extract the collective views of experts regarding the importance of digital technologies in digitizing and documenting heritage. This critical examination is based on a separate table displaying a variety of responses to serve as a column. The quantitative backbone of qualitative explanations Table 4.

1.Technology transformations in heritage

The mean score is 4.22, with the mode being “strongly agree” (5). The clear consensus among participants confirms that the transformations brought about by technology in the field of heritage have been profound. The standarddeviation of 0.739 points indicates a wide range of responses.

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2. Documenting heritage using effective tool

The mean score is 4.23, and the mode is "strongly agree" (5). There is a large consensus that digital technologies constitute effective tools for documenting urban areas with important heritage. Although the standard deviation of 0.537 indicates a noticeable difference in opinions, in general there is agreement.

3. Digital technologies and detection of heritage area

The mean is 3.98 regarding the necessity of using efficient techniques in detecting heritage areas, with agree (4) as the most common response, and the standard deviation of 0.676 indicates a difference in views, albeit with a general tendency toward agreement.

4. The need for advanced documentation techniques

The mean score of 4.35 and the "strongly agree" (5) indicate agreement on the increased need to use advanced technologies in heritage documentation, such as lidar and laser scanning, and the standard deviation of 0.761 indicates diverse answers but strong consensus.

5. Documentation, skills, and experience

The mean of 4.35 with Strongly Agree (5) highlights a strong position on the need for those undertaking documentation to be sufficiently experienced and skilled, with a standard deviation of 0.777 reflecting broad agreement.

6. Digital technologies, speed, and quality of work

The mean of 4.43 with strongly agree (5) indicates a unified opinion regarding the ability of digital technologies to enhance the speed, efficiency, and quality of work. Although the standard deviation of 0.673 indicates diversity in the answers, there is prevailing agreement.

7. Cooperation between the public and private sectors

The mean score is 4.02, with mode of agreement (4) as the most common answer. There is a general consensus on the need for cooperation between the public and private sectors to enhance documentation of heritage areas, and a deviation of 0.965 indicates widespread responses.

8.Updated database

The mean of 4.3 and very agree (5) reflects agreement on the urgent need to have a constantly updated database to ensure the addition of new data, with a standard deviation of 0.591 indicating a noticeable difference in opinions, but in general there is agreement.

9. Historical building information modeling (HBIM) database

Participants indicate a mean agreement of 4.17 that buildings and architectural structures need a protection database represented by historical building information modeling to ensure protection and management, with agree (4) as the common answer and a standard deviation of 0.668 indicating diversity but generally positive.

10. Digital technology and its relationship to protection

The mean score indicates 4.38 with mode strongly agree (5) as there is a firm belief that technology provides toolstoprotect heritage from destruction and loss, with a standard deviation of 0.585. Although

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it indicates a difference in opinions, there is agreement.

11. The stage of creating a database and its protection

This aspect recorded the highest mean of 4.48 with mode Strongly Agree (5) as a method that emphasizes belief in the role played by the database creation stage in protecting heritage, and the standard deviation is 0.596. Although it indicates a diversity of opinions, there is a prevailing agreement.

12. Use of documentation information in tourism

The mean of 3.93 with mode agree (4) indicates the possibility of using the information and final images resulting from the documentation in marketing tourist destinations, and the standard deviation of 0.634 indicates diverse answers, but there is comprehensive agreement

Table 4. shown Responces obtained from a survey

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Mode	Standard Deviatio
The field of heritage has seen significant transformation as a result of technology.	0	1	8	28	23	4.22	Strongly Agree	0.739
Digital technologies are powerful tools for documenting urban areas with significant heritage.	0	0	2	37	21	4.23	Strongly Agree	0.537
Efficient technologies such as lidar should be used to detect heritage areas.	0	0	14	33	13	3.98	Agree	0.676
There is an increasing need to used advanced technologies in documenting heritage areas such as 3D scanning and lidar.	0	3	24	26	7	4.35	Srongly Agree	0.761
Documentation requires technical skills and expertise to ensure comprehensive and accurate documentation of areas of heritage value.	0	1	8	20	31	4.35	Strongly Agree	0.777

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The use of digital technologies has had a positive impact on the documentation process in terms of speed, quality and efficiency of work.	1	0	3	25	31	4.43	Strongly Agree	0.673
Pubic-private cooperation to enhance documentation of heritage areas.	1	3	12	22	22	4.02	Agree	0.965
The need for a constantly updated GIS database to ensure the addition of new data layers.	0	1	1	37	21	4.3	Strongly Agree	0.591
The need to provide a database of historical building information modeling (HBIM) of historical structures and buildings to provide an accurate method for preservation.	0	1	6	35	18	4.17	Agree	0.668
Digital technology has provided important tools to protect and preserve heritage from destruction and loss.	0	0	3	31	16	4.38	Strongly Agree	0.585
The database creation phase is an essential tool for buildings and urban sites.	0	0	3	25	32	4.48	Strongly Agree	0.596
The information and images resulting from documenting heritage areas can be used in media publication for tourism and destinations marketing.	0	1	11	39	9	3.93	Agree	0.634

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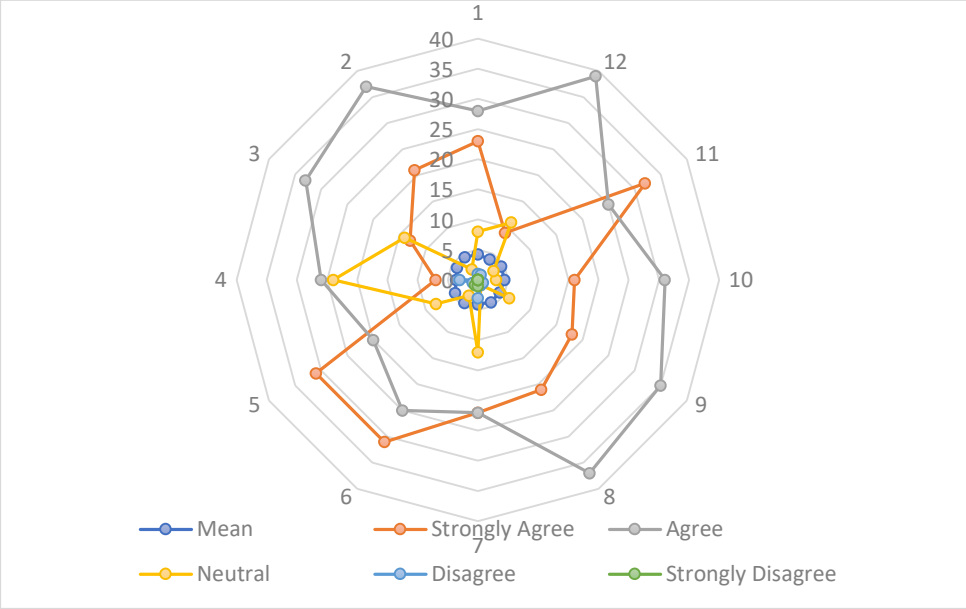

Figure 4. Responces obtained from a survey

4. Results

7.1 Technology transformations in heritage fields

Digital technology has facilitated the process of documenting and preserving heritage sites using various technologies and has made it possible to create digital copies of sites, ensuring their long-term preservation. It has facilitated access to information for a wider audience through applications and websites and has made it possible to learn about heritage in interactive ways, such as educational games and virtual reality.

7.2 Digital technologies are effective tools for documentation

Digital technologies constitute effective tools for documentation by providing a wide range of techniques for data collection and analysis, creating digital copies of urban areas, and providing comprehensive documentation used for conservation, study, and to support management of heritage urban environments.

7.3 Detection using digital technologies

The use of efficient technologies such as LiDAR to detect heritage areas is important, through which comprehensive data can be collected about heritage areas. It is characterized by its flexibility, easy access to difficult or dangerous places, and the availability of high-resolution images, in addition to its speed, which makes it effective in documentation.

7.4 The increasing need for documentation using advanced technologies

The need for lidar in documenting heritage areas is increasing for many reasons, including providing high-resolution data for landmarks, buildings, and infrastructure of heritage areas, which enables planners and engineers to better understand their characteristics and components, and providing

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accurate three-dimensional models of heritage areas, which facilitates their analysis and evaluation .These models can be used for tourism and education purposes.

7.5 The documentation process requires skills and experience

Documentation requires technical skills and expertise to ensure comprehensive and accurate documentation. Skills include knowledge of heritage, a good understanding of its types and importance, high-resolution photography skills, accurate surveying skills of areas, and the ability to use technologies. Training and continuing education are important to ensure that documenters have the experience and skills necessary to conduct comprehensive documentation in all areas.

7.6 Digital technologies, speed, and quality of work

The use of digital technologies has had a significant positive impact. These technologies help speed up the documentation process and reduce human errors. They also allow information to be stored securely and easily accessible. They can also improve the quality of documentation and provide greater efficiency in documentation.

7.7 Cooperation between the public and private sectors

Collaboration between the public and private sectors is a powerful tool to enhance the documentation of heritage areas, as the public sector provides resources and funding while the private sector can provide technical expertise and innovation, which contributes to revolutionizing the way heritage sites are documented and preserved.

7.8 A constantly updated database

Updating the database regularly helps maintain the accuracy of the data, and updating spatial information periodically. Thanks to GIS and HBIM technology, new data can be easily added or out-of-date data removed, which helps maintain the accuracy and quality of the data.

7.9 Database for buildings and structures

The HBIM database helps comprehensively document the historical infrastructure
of buildings, such as architectural, historical, and construction details. This data is used to conduct infrastructure analysis, develop strategies for preserving buildings and structures, and ensure the continuity of architectural heritage.

7.10 Digital technology and protection

Digital technology contributes to protecting and preserving heritage by providing accurate and effective tools to document and analyze urban areas and buildings through databases such as GIS and HBIM.

7.11 Database and protection

Creating a database is an essential step in protecting buildings and urban areas to preserve them, as the documentation process leads to creating a database and organizing the systematic collection of information in a database. These rules represent the basis for providing protection against risks and contribute to understanding the value of heritage, such as GIS and HBIM.

7.12 Documentation and tourism

Digital tourism requires a huge database that contains all the information that the tourist needs to obtain the service. Therefore, the final information and images that have been documented and archived in the

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database of a region or site can be used for media dissemination in the field of tourism to create distinctive content that attracts visitors, such as pictures, articles, and blogs. And virtual tours to help promote, market, and enhance tourism.

5. Conclusion

The world is currently witnessing a technological revolution that has affected various areas of life, causing profound and irreversible transformations, some of which have had a positive impact on the mechanism of work, its efficiency, speed, and quality. Heritage is one of the fields that has significantly benefited from digital transformation, as technology has played an important role in the field of heritage by providing effective tools to protect and preserve it in the long term. This process requires a comprehensive approach that combines scientific, artistic, political, and societal efforts, and documentation is a step. Essential to the conservation process, which requires intervention from all concerned parties. Documentation includes sequential and deliberate stages that ensure comprehensive and accurate documentation. These stages vary according to the type of heritage being documented, but in general they include disclosing the site, documenting the site, and then creating a database, and each stage has specific techniques. These stages represent the general framework of documentation, and their details may vary in terms of the possibility of adding or deleting a step according to its purpose and need. Documentation comes as a prior precautionary step in the event it is exposed to damage and destruction, or it may come after it is exposed to these factors for the purpose of analysis, study, and documentation of the damage.

The documentation process requires technical and scientific skills and expertise, so it is conducted by specialized bodies such as the public sector in cooperation with the private sector using various technologies to be stored and archived in digital bases for the purpose of development and preservation and for purposes with more comprehensive planning dimensions.

The old Rusafa area has cultural and historical value and is rich in buildings and monuments dating back to the Abbasid era. It requires comprehensive documentation using various advanced technologies to protect it and promote tourism. Documentation helps understand the value of this area and its historical importance and encourages taking concrete steps to protect it from factors that threaten it, such as expansion and neglect. Documenting this region will lead to the creation of a database that includes all information related to it, such as its architectural landmarks, its population, and its history. The database can be linked to photographs and 3D models of landmarks, as well as the creation of a website to provide images and virtual tours of the region to enhance tourism and promote and market the region’s heritage.

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