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A Framework for Community Participation in Conservation of World Heritage Site by Using Smartphone Application

Case Study: Bisotun World Heritage Site

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Declaration

I hereby declare that, the contents and organization of this dissertation constitute my own original work and does not compromise in any way the rights of third parties, including those relating to the security of personal data.

Ahmad Nasrolahi

2023

I would like to dedicate this thesis to my lovely family…Leila, Tiam & Roham

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Abstract

Local participation in cultural heritage conservation has been a concern since the adoption of the Venice Charter in 1964. The Faro Convention of 2005 shifted the focus from the values of cultural heritage to the values of cultural heritage for society, emphasizing the need for maximum engagement of stakeholders in all stages of management. This research specifically focuses on empowering local communities and involving them in the conservation and management of cultural heritage sites. The research questions addressed in this thesis are: How can a mobile application be developed as a tool to facilitate interactions between cultural heritage institutions and local people in the protection of cultural heritage sites? How can a participatory approach to cultural heritage conservation and management be applied, given that public engagement is critical to the long-term preservation of cultural heritage?

The study employs a qualitative, case-study-based methodology. The research was conducted within a local community that is affected by a protected area (the landscape zone of the Bisotun World Heritage Site) as a way to find out how those affected people can be included in the decision-making process. The Bisotun World Heritage Research Base, which was set up in 2000 as a national research center and designated as a world heritage site in 2006, is in charge of preserving and managing the Bisotun landscape zone. The Research Base, which served as the government organization in this study, has long wished to involve the local community in the conservation and management of the Bisotun landscape zone. Based on international documents about the community-based participation approach, the government organization, and the local participants, the iCommunity application's needs and requirements have been figured out, and a digital prototype of the application has been made using Adobe XD software. Then the prototyped application was repeatedly modified in order to provide a standard mock-

up. The results of this research show how the local community can be involved in making decisions about the Bisotun World Heritage Site. It also provides guidance, strategies, and challenges for long-term effective community participation at the Bisotun World Heritage Site. Moreover, the iCommunity mobile application was prototyped using a participatory approach based on the real users' needs and desires.

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1 Chapter One: Introduction

Local participation in cultural heritage conservation has always been a concern since the Venice Charter so far (1964). In addition, the Faro Convention (2005) shifted focus from cultural heritage values to the values of cultural heritage for society. In this case, it is necessary to achieve the maximum engagement of stakeholders in all stages of management. Nowadays, the concept of community engagement in all stages of cultural heritage management is widely accepted and considered important by many in the field (I. UNESCO, ICOMOS, IUCN, 2013). If we accept that community engagement is beneficial for cultural heritage conservation and management, one challenge can be finding ways to encourage and enable people to participate. In some cases, communities may not be fully aware of their rights regarding their cultural heritage, and some cultural heritage authorities may face challenges in involving people in their decision-making processes.

While there are examples of successful community engagement in cultural heritage management and guidelines for implementing a people-centered approach, it can still be challenging to determine the best way to use such an approach in the context of cultural heritage. Even in an ideal society where people are aware of their rights and administrators are open to collaboration, finding the most effective methods for community engagement may require ongoing effort and adaptation to the specific context and needs of the community and cultural heritage in question. This refers to two main issues related to the community engagement approach: the lack of a recognized method for applying a people-centered approach in cultural heritage conservation on the one hand, and determining an appropriate tool for that purpose on the other hand. This research developed and examined a method and a tool to facilitate public participation in cultural heritage conservation management. The focus of this research is on involving and empowering the local community, including residents, authorities, and other interested parties, in the decision-making process and implementation of heritage conservation initiatives.

Engaging local community in conservation is different from visitor and tourism participation and engagement, which refers to the ways in which cultural heritage

institutions[1] use technology and other means to enhance the visitor experience and promote tourism. While both local community engagement and visitor engagement are important in the context of cultural heritage, **this research specifically focuses on empowering the local community and involving them in the conservation and management of cultural heritage sites**.

1.1 Overview

Cultural heritage management[2] is a complex and multifaceted task that involves preserving and managing culturally and historically significant sites, monuments, buildings, and artifacts. The successful and sustainable conservation and preservation of cultural heritage sites requires the participation of local communities and individuals in cultural heritage management (Bandarin & Van Oers, 2012; Committee, 2021). Due to a number of factors, however, the effective participation of communities in cultural heritage management can be a challenging and intricate process.

One of the primary obstacles is the lack of community engagement and participation in cultural heritage management decision-making processes. Communities and locals frequently feel excluded from cultural heritage management decision-making processes, which can lead to a lack of trust and a feeling of detachment from cultural heritage management initiatives. This can lead to a lack of commitment and engagement, which can eventually result in the deterioration of cultural heritage sites. Another difficulty is the lack of understanding and awareness of the significance and value of cultural heritage sites among local communities and individuals. Without understanding their broader cultural and historical significance, many people may view

[1] Cultural heritage institution is "an organization that operates under a culture/subculture to preserve or promote cultural heritage" (Moreira & Ward, 2021).

[2] Cultural heritage management (CHM) is the practice of managing cultural heritage sites and resources. It involves the identification, interpretation, maintenance, and preservation of significant cultural sites and physical heritage assets, as well as intangible aspects of heritage such as traditional skills, cultures, and languages. The goal of CHM is to balance the conservation of cultural heritage with its sustainable use and development. This often involves collaboration with various stakeholders, including local communities, government authorities, and experts in the field. CHM also involves addressing the social, economic, and environmental threats and opportunities that can impact heritage places and their significance. Heritage managers must have the capacity to influence decisions about what takes place in the surroundings of heritage places to ensure that changes do not damage their values (I. UNESCO, ICOMOS, IUCN, 2013).

cultural heritage sites as nothing more than historical places. This can result in a lack of engagement and motivation in cultural heritage management initiatives (Grcheva & Oktay Vehbi, 2021).

In addition, there can be imbalances of power between the various stakeholders in cultural heritage management. Local communities and individuals may feel excluded and powerless if government agencies and other powerful entities dominate decision-making processes. This can lead to a lack of confidence and opposition to cultural heritage management initiatives. Lastly, a lack of resources and funding for cultural heritage management initiatives can hinder the ability of communities and locals to participate in conservation and preservation efforts effectively. This can lead to a lack of engagement and participation, as communities and local people may lack the resources or expertise necessary to contribute to cultural heritage management initiatives.

To overcome these obstacles and promote effective community and local people participation in cultural heritage management, a number of strategies can be implemented. Developing participatory decision-making processes that include community members and locals in the planning, implementation, and evaluation of cultural heritage management initiatives is one approach. This can help foster a sense of ownership and engagement among community members, resulting in greater commitment and participation. Promoting greater awareness and education about the value and significance of cultural heritage sites and their broader cultural and historical significance is a second strategy. This can contribute to the development of a sense of pride and attachment among community members, resulting in greater motivation and participation in cultural heritage management initiatives (Wanner, 2022).

Consequently, partnerships can be established between government agencies, local communities, and other stakeholders to ensure that cultural heritage management initiatives are carried out in a collaborative and inclusive manner. This can help to promote trust, reduce power imbalances, and ensure that the interests and concerns of local communities and people are considered in cultural heritage management decision-making processes.

Mobile applications have revolutionized our daily lives by providing numerous advantages and benefits. For example, they offer convenience by allowing us to access information and services easily and quickly, from anywhere and at any time. Mobile apps have facilitated various activities, such as shopping online, booking a ride, paying bills, ordering food, and making reservations, without leaving our homes. Furthermore, mobile applications offer advantages such as improving productivity, providing educational resources, and promoting health and well-being through fitness and wellness apps.

Mobile applications are also valuable in the context of cultural heritage management. They can provide a platform for communication, information sharing, and collaboration between local communities, heritage professionals, and other stakeholders (Cao, Srirama, Chatti, & Klamma, 2006). For instance, heritage professionals can use mobile applications to understand the community's perspectives on cultural heritage sites and involve them more effectively in decision-making processes related to heritage management. Moreover, mobile apps can offer access to practical and historical information about cultural heritage sites, increase public awareness and understanding of cultural heritage, and promote sustainable tourism practices. By facilitating engagement and participation in cultural heritage management activities such as volunteering, fundraising, and advocacy, mobile apps can empower communities and provide them with more power to make their own decisions for conservation and management.

1.1.1 Current Situation

Community-based participation in preserving cultural heritage needs a collaborative and inclusive approach that involves local communities as active participants in decision-making processes. But in Iran, this process can be harder because of things like a lack of knowledge and interest, a lack of resources, a lack of skills, the way power works, and a lack of trust. The recent Mahsa Amini[3] movement

[3] Mahsa Amini was a 26-year-old Iranian woman who died on September 16, 2022, while she was in police custody, and her death sparked widespread outrage and protests in Iran. The death of Mahsa Amini has sparked a movement in Iran, with many Iranians using social media to demand justice for her and other victims of police brutality and human rights abuses. The movement, which began under the

in Iran has also brought up the problem of unequal power relationships and the need for more community involvement in decision-making.

The Mahsa Amini movement, which gained momentum in Iran in 2022 and is still going, brought attention to the issue of gender-based violence and systemic inequalities in the country. Mahsa Amini, a young woman, is believed to have died after police arrested her for failing to wear a hijab in public, which is what sparked the movement. The movement led to protests all over Iran and started talks about human rights, justice, and who is responsible for what. In this situation, the Mahsa Amini movement has had complicated and many different effects on how people participate at the Bisotun World Heritage Site.

On the one hand, the movement made people in local communities more aware of and involved in issues of human rights and social justice. This could potentially lead to greater interest and involvement in community-based conservation initiatives at the Bisotun World Heritage Site, as communities may be more inclined to participate in activities that promote their rights and interests. On the other hand, the Mahsa Amini movement also made some people in the community mistrust the government and its institutions and lose faith in them. People might think that because these programs are run by the government, they are inherently corrupt or not legitimate.

As a result, they might be less likely to join community-based conservation efforts. The movement also made the country's politics more divided and tense, which could make it harder for local communities to work well with the Bisotun World Heritage Site and other government agencies. This could make it harder for people to talk to each other and work together, which could make it harder for community-based conservation efforts at the site to work.

Even in this complicated situation, in a number of ways, the iCommunity application can make it easier for people to take part in the Bisotun World Heritage Site. The iCommunity application makes it easy for people in the area to find out about the Bisotun World Heritage Site and the ongoing work to protect it. This can make

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hashtag #JusticeForMahsa, has since expanded to include broader calls for reform and greater civil liberties in Iran.

people in the community more aware and interested and encourage them to join conservation efforts. The app also makes it easy for the Bisotun World Heritage Site management team, experts, and local communities to talk to each other. This makes it easier to talk about conservation activities and lets people share ideas and get feedback.

With the iCommunity app, local communities can report on the condition of cultural heritage monuments and sites in the Bisotun Landscape Zone. This is called participatory monitoring. This engages the community in the monitoring process and can increase their sense of ownership and responsibility for conservation efforts. The iCommunity application's Voluntary Positions feature makes it possible for the Bisotun World Heritage Site to find volunteers for certain jobs. This can improve community participation by providing opportunities for local community members to get involved in conservation efforts and gain experience and skills in the field. The iCommunity application makes it possible for people to share old pictures, stories, videos, maps, and other useful information about the Bisotun World Heritage Site. This can help increase community engagement and a sense of ownership over the site.

Cultural heritage management involves the preservation and management of culturally and historically significant sites, monuments, buildings, and artifacts. The successful conservation and preservation of these sites requires the participation of local communities and individuals in cultural heritage management. However, effective participation can be challenging due to various factors, such as a lack of community engagement and participation in decision-making processes, a lack of understanding and awareness of the significance and value of cultural heritage sites, imbalances of power, and a lack of resources and funding.

To overcome these obstacles and promote effective community and local participation in cultural heritage management, several strategies can be implemented. These include developing participatory decision-making processes that include community members and locals, promoting greater awareness and education about the value and significance of cultural heritage sites, establishing partnerships between government agencies, local communities, and other stakeholders, and using mobile applications to facilitate communication, information sharing, and collaboration between local communities, heritage professionals, and other stakeholders.

Mobile applications offer several advantages, such as providing a platform for communication, information sharing, and collaboration between local communities, heritage professionals, and other stakeholders; offering access to practical and historical information about cultural heritage sites; increasing public awareness and understanding of cultural heritage; and promoting sustainable tourism practices. By facilitating engagement and participation in cultural heritage management activities such as volunteering, fundraising, and advocacy, mobile apps can empower communities and provide them with more power to make their own decisions for conservation and management.

While social media platforms such as Facebook can be used for community participation to some extent, they have limitations that make them less effective compared to specialized mobile applications for cultural heritage management. These limitations include a lack of focus on a specific topic or purpose, unreliable and unverified content, limited accessibility, and a lack of a secure and private environment for sensitive information (Liang, Lu, & Martin, 2021).

1.2 Research Objectives and Questions

The primary objective of this research was to develop, demonstrate, and evaluate a methodology for implementing community participation in the management of cultural heritage sites, using the Bisotun World Heritage Site as a case study. To achieve this objective, a mobile application was designed to serve as a tool for effective community participation at the Bisotun World Heritage Site. The mobile application facilitates communication, information sharing, and collaboration between site managers and the local community, providing a generic solution that can be applied to other cultural heritage sites. The methodology was developed in response to the research questions:

How can a participatory approach to cultural heritage conservation and management be applied, given that public engagement is critical to the long-term preservation of cultural heritage?

In addition, it is abundantly clear that a project that engages the community necessitates the establishment of a tool that facilitates communication between the numerous individuals who are engaged in the project. Mobile apps that facilitate social networking, communication, and participation are increasingly being utilized in

organizations devoted to the preservation of cultural heritage (Cao et al., 2006; Rolando & Scandiffio, 2013). Hence, a related question is:

How can we develop a mobile application that can be used as a tool to facilitate the interactions between cultural heritage institutions and local people in the protection of cultural heritage sites?

1.3 Research Methodology

This research followed a qualitative approach, utilizing a review of the literature, interviews, and human-computer interaction evaluations to gather information. The research began about five months before the COVID-19 pandemic, with the author initially planning to conduct in-person research with people in the area. However, the pandemic made it impossible for people to interact in the same way as before, leading to a shift towards remote communication. Despite the challenges posed by the pandemic, this research was able to adapt and continue through the use of digital platforms.

A case study was carried out at the Bisotun World Heritage Site over the course of two years as part of this research. The site had previously worked with the local community to some extent, which helped build relationships with the people living there. In the coming years, they plan to continue using a community-based approach in their conservation and management system to involve people in decision-making. This approach aims to empower local communities and provide them with more agency in the conservation and management of their cultural heritage.

1.4 Thesis Structure

The first chapter introduces the research, providing background information and highlighting the main problems and objectives. It outlines the research's goal, objectives, and questions, while also explaining the research structure and methodology.

Chapter two presents a literature review on people’s participation in cultural heritage and users' involvement in computer sciences. It discusses global and national contexts, including the impact of the Islamic Revolution on cultural heritage

participation in Iran. The chapter also covers the development of human-computer interaction and different approaches to user participation in design, along with the role of digital platforms in preserving cultural heritage.

In chapter three, the detailed process of data collection and analysis is explained. Various methods, such as interviews, focus groups, and evaluations, were used to collect data from computer science and cultural heritage experts. Thematic analysis was employed to identify patterns and themes within the data.

Chapter four, Development Framework, outlines the research design and procedures employed for our project. We introduce the iCommunity Model as the foundational framework and describe the steps involved in our participatory design approach. This chapter details the development process, from observing users at the Bisotun World Heritage Site to the design and modification of the prototype.

Chapter five, Evaluations and Results, delves into the hypothesis, participants, apparatus, and materials used in our study. The chapter presents the findings, starting with community-based participation themes derived from interviews, including themes related to misunderstanding, irregularity, exclusivity, unwillingness, and the hierarchy of power. Furthermore, it discusses the results of usability evaluations, including the collection of user opinions in HCI, predictive evaluation, and mobile application heuristic assessments. This chapter provides a comprehensive overview of the research outcomes, shedding light on the various aspects explored in our study.

Chapter six engages in a thorough discussion of key findings and implications. It addresses the identified challenges, such as the lack of awareness and interest, limited resources, hierarchy of power, power dynamics, lack of trust, and privacy concerns. Furthermore, the chapter offers recommendations for planning for people's participation, emphasizing the need to build trust and enhance capacity within the community. It also acknowledges the limitations of the research, providing a comprehensive reflection on the study’s scope and constraints. This chapter serves as a critical synthesis of the study's outcomes and lays the foundation for informed recommendations and future considerations.

The last chapter provides a concise summary of the study's key findings and their significance. It offers a comprehensive overview of the research outcomes, tying

together the discussions from previous chapters. Additionally, the chapter briefly touches on potential avenues for future work, highlighting areas where further research and development could build upon the current study.

2 Chapter Two: Literature Review

In this chapter, people's participation in the global context; the concept of people's participation in Iran; digital platforms in cultural heritage; and designing an interface for facilitating people's participation in the cultural heritage context have been researched. People's participation includes a wide range of studies and research in different disciplines, from political, societal, technical, cultural, and economic efforts narrowing down to the specific branches of science such as urban planning, environmental studies, computer science, and so forth. Despite the vast number of participatory research and practices in urban planning and computer science as the first topic, there has been little effort to integrate participation in cultural heritage conservation via mobile applications[4]. Therefore, it was a choice to survey the urban planning participatory approach or human-computer interaction methods. Using mobile applications and the treasured resources in the participatory approach to human-computer interaction, attracted the author's attention to choose the second one, which covers both sides of the topic: designing an interface and people's participation in a decision-making process.

The second range of reviewed documents measured the concept of people's participation in cultural heritage issues in the national context. In order to provide a general overview of the specific situation of people and cultural heritage in Iran (which is actually specific in each country), a brief history of public and cultural heritage interactions in the last century will be presented. Due to the lack of concrete information and documents relating to the topic, the main resource was the approved documents in the online library of the Iran Parliament Research Center.

The exploration of digital platforms in the context of cultural heritage highlights the significance of utilizing these platforms to involve individuals with cultural heritage institutions. This significance is aimed at rationalizing the reasons behind the usage of mobile applications in people's participation in cultural heritage management and

[4] The author is aware that there are lots of valuable achievements in using new technology in visitor engagement and management at cultural heritage institutions. But in this research, participation refers to the combination of all levels of *local community engagement* in cultural heritage conservation, from informing to empowering community members in the decision-making process.

conservation. In this regard, the research reviewed the reports and documents focused on the impact of social media on cultural heritage, digital platforms' assistance on people's participation in cultural heritage, and the current impact of digital platforms and social media in Iran. This part of the literature review led to answering the question of why social media is unable to act as a tool for people's participation purposes, in spite of the fact of their values in improving awareness and providing a form of freedom of expression.

2.1 Definitions

People Participation or *citizen participation*, in general terms, means "a state or common wealth's members taking part in the political processes that lead to the selection of political leaders and determine or influence public policy" (Getty, 2022). This definition does not cover all areas of participation. The United Nations Development Programme (UNDP) has provided a better description of citizen participation, which was adopted in this research. According to the UNDP report, "participation means that people are closely involved in the economic, social, cultural, and political processes that affect their lives" (Abel Fattah Nassef - Project Team Leader, 1993) which is the definition that has been used in this research. This meaning of public participation also implies a people-centered approach, people engagement, public involvement, and so forth. People's participation is a basic human right and a core principle of democracy, while there is no compulsion to participate.

Community-based Participation: another form of participation is community participation, which means "the involvement of people in a community in projects to solve their own problem" (Harvey, Baghri, & Reed, 2002). A community is defined as a group of people or nations that share a common history, characteristics, or social, economic, and political interests and live in a specific area (Merriam-Webster, 2022). The difference between public participation and community participation is the size and scale. Public participation pertains to engagement with the broader populace, whereas community participation operates within the confines of local and communal spheres. All forms of community engagement, such as community-based involvement, community-led involvement, community-based participation, community engagement, community-based approaches, community-centered participation, and so on, are included in the definition of community participation.

Participatory Design refers to a democratic process in which users participate in the social or technical design of a service or system, based on the idea that affected people must not only be involved in the process of decision-making but also have equal input in interaction design. In a nutshell, participatory design involves user participation in the design process for work practice. Rather than users, when local people or a community engage in the process of designing, it forms a community-based participatory design (Muller & Kuhn, 1993).

Informing: the "public's participation goal of informing is to provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities, and/or solutions" (IAP2, 2018). It means that all kinds of related information must be publicly published. Moreover, 'informing' in the spectrum of public participation, which is informing, consulting, involving, collaborating, and empowering, will make sense when it acts as a part of the whole process. Since Arnstein's Ladder of Citizen Participation in 1969 (Arnstein, 1969), informing has always been considered a prime stage in people's participation theory. At that time, even until the early twenty-first century, the authorities had the power to inform people or not, as they wished, but after the emergence of the information age, people have independent access to almost all the data whenever and wherever they need. How are people supposed to be informed while they already know? If they would like to, of course. It will be argued that these days informing moved down from a form of participation to a non-participation level. It is interesting to say that sometimes (or probably usually) informing deceives the authorities as well as people in the participation process. In this form, the informing stage itself is considered a kind of public participation, which is literally not. It is again highlighted that *informing*, *consulting*, *involving*, *collaborating*, and *empowering* must be implemented as a system to be able to consider people's participation.

Consulting: although most often 'consultation' is considered a part of the participation process, there is a huge gap between consultation and participation. "Asking or being asked for information and advice" is the implicit concept of consultation meaning, while participation means having a part, collaborating, and sharing ownership or responsibility, which is totally different from the meaning of consultation. Moreover, participation displays various forms of 'communication' and

'involvement' that imply a strong mutual connection. That's why some experts consider a consultation a weak form of listening, which is on the opposite side of the participation (Involve, 2005).

Involving or engaging is the main hidden principle of participation, which means having or including (something or someone) as a necessary or integral part or result and causing one to participate in an activity or situation. In fact, participation without involvement is meaningless. The goal of involvement is "to work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered" (IAP2, 2018).

Collaborating means working jointly on an activity or project. The aim of collaborating is "to partner with the public in each aspect of the decision, including the development of alternatives and the identification of the preferred solution" (IAP2, 2018). At this stage, the authorities will look to people for advice and innovation in formulating solutions and will incorporate people's advice and recommendations into the decisions to the maximum extent possible.

Empowering is considered a utopia and a promised land in the people's participation approach, where all public participation practitioners wish to get there. Literally meaning, empowering is "giving (someone) the authority or power to do something." Moreover, it means "making (someone) stronger and more confident, especially in controlling their life and claiming their rights". The goal of the empowerment stage in people's participation is "to place final decision-making in the hands of the public" (IAP2, 2018). Later on, we will discuss how it is an impossible, or at least backbreaking, attempt to achieve the empowering level.

iCommunity is a term that we have used in this research to separate the mobile application and the model that has been created during this study. This term is used in two ways; iCommunity application and iCommunity model. The first phrase refers to the prototyped mobile application, and the second implies the method has been adapted throughout the research for applying community participation in cultural heritage conservation and management.

2.1.1 Core Values of Public Participation

The general core values have been introduced by the International Association for Public Participation (IAP2) institution, which has been repeatedly accepted by participation practitioners as the following:

- "Public participation is based on the belief that those who are affected by a decision have a right to be involved in the decision-making process.
- Public participation includes the promise that the public's contribution will influence the decision.
- Public participation promotes sustainable decisions by recognizing and communicating the needs and interests of all participants, including decision-makers.
- Public participation seeks out and facilitates the involvement of those potentially affected by or interested in a decision.
- Public participation seeks input from participants in designing how they participate.
- Public participation provides participants with the information they need to participate in a meaningful way.
- Public's participation communicates to participants how their input affected the decision" (IAP2, 2017).

These core values assisted us in identifying and extracting the core values of community participation in the conservation and management of the Bisotun World Heritage Site.

2.1.2 Principles of Public Participation

Community-based participatory research is a partnership approach to research that equitably involves researchers, community members, and organizational representatives in all stages of the engagement process and in which all partners contribute knowledge and share decision-making. Despite the origins in public health participatory research, they are applicable to other forms of participatory research. The principles of Community-based participatory research, as developed and adopted by this research, along with a more detailed explanation of each principle, are listed below. These general principles are extracted and adapted from the previous participatory

research approaches in developing countries dealing with marginalized populations; inclusivity, engagement of stakeholders in the research process, and global north traditions addressing societal problems by involving affected individuals in a cyclical problem-solving process. These principles were originally proposed by Israel et al. (Israel, Eng, Schulz, & Parker, 2005), and later on, other researchers augmented them (Minkler & Wallerstein, 2008). Now, eleven principles are implemented in Community-based participatory research, and each partnership can choose its own composition and initiatives. Community-based participatory research is encouraged to use the eleven key principles as a guide in order to create a unique set of principles that align with the local context (Wallerstein & Duran, 2006). These core principles helped us to form the iCommunity approach principle in the next chapters. The principles are:

- Community is recognized as a unit of identity by Community-based participatory research, which includes an emotional connection and identification with people, shared values, common language and customs, similar needs and interests, and so on.
- Community-based participatory research builds on strengths and resources within the community, including the individuals' and families' skills, and the valuable networks of social relationships.
- Community-based participatory research facilitates collaborative and equitable partnerships in all research phases and involves an empowering and power-sharing process that addresses social inequalities.
- Community-based participatory research promotes co-learning and capacity building among all involved partners, including mutual transfer of knowledge, skills, and capacities.
- Community-based participatory research integrates and achieves a balance between research and action for the mutual benefit of all involved partners.
- Community-based participatory research involves a cyclical and iterative process for systems development.
- Community-based participatory research involves all partners in the dissemination process and disseminates findings and knowledge gained to all involved partners.

- Community-based participatory research requires a long-term process and a commitment to sustainability not based on single research and intervention.
- Community-based participatory research addresses issues of race, ethnicity, and social class in a transparent and accepting manner; embodies cultural humility.
- Community-based participatory research ensures that the research conducted is rigorous and valid.

2.2 The Concept of People's Participation in International Charters and Conventions

Public participation in cultural heritage conservation looks to be more top-down than bottom-up. *The Operational Guideline for the Implementation of the World Heritage Convention* (Operational Guideline) encourages the state parties to involve local people and national populations in various stages of cultural heritage conservation and management. It states that the state parties must adopt an effective method of public participation to ensure the maximum engagement of a wide variety of stakeholders in a sustainable approach. This idea can be understood differently. For example, consider Iran's cultural heritage associations set up by the Ministry of Cultural Heritage, Handicrafts, and Tourism (MCHHT), where the involvement of the public has been entirely taken out of its constitution. They assume it is possible to replace the people's participation with the local authorities' participation, which will be argued later on.

The latest version of the Operational Guidelines (2021) encourages state parties to adopt a gender-equity and human-rights-based participation approach in the identification, nomination, conservation, and management processes of world heritage properties. It declares that a wide variety of rights holders and stakeholders, including local and regional governments, site managers, local communities, indigenous peoples, NGOs, and other interested parties should be involved in all stages of the conservation process. World Heritage properties can support ecosystem benefits and biological and cultural diversity to enhance environmental and cultural sustainability. This ability is also capable of improving the quality of life and well-being of local communities by encouraging and promoting equitable, inclusive, and effective community-based

participation that engages indigenous peoples and stakeholders. This community-based participation aims to enhance capacity building and research; increase public awareness, understanding, and appreciation of the need to preserve cultural and natural heritage; improve the role of World Heritage in community life; and increase the equitable, inclusive, and effective participation of local and national populations, including *indigenous* peoples in the protection and presentation of heritage (Committee, 2021).

2.2.1 Historical Overview

The concept of community participation in cultural heritage issues dates back to the ratification of the *World Heritage Convention* in 1972. Although the Convention did not make a direct reference to this term, it adopts a general policy aimed at giving cultural and natural heritage a function in community life. This idea has been enhanced over time in charters and international documents (Srijuntrapun, Fisher, & Rennie, 2018). In 1975, the *Amsterdam Declaration* (ICOMOS, 1975) was probably the first international consensus on community engagement in cultural heritage management.

The *Amsterdam Declaration* concerned the social dimensions of heritage management as the main principle. It mentioned that taking social factors into consideration is the key to successfully integrating conservation. The declaration also stated that conservation is not a matter just for experts; the support of public opinion is a vital element for the effective management of cultural heritage. It was explicitly stated that people should take an active role in every stage of the work, from design to decision-making, by helping them to understand the situation, clarifying values, and publishing the entire plan. The declaration suggests that the local authorities should call for citizens' participation. They should provide a meeting place for the public to consult together. Furthermore, the decisions of local authorities should be put in the public eye for learning, discussing, and assessing the purposes of the local communities in the form of exhibitions, opinion polls, and the use of mass media. They also should facilitate the formation and efficient functioning of voluntary associations for conservation. In addition, it stated that one of the most important requirements for effective heritage management is the education of young people on environmental issues and their involvement in conservation.

Later on, in 1987, the *Washington Charter* (ICOMOS, 1987)recommended that to encourage people to participate and to be involved, it is necessary to set up an information program for all residents, including children of school age. The Charter is concerned that the participation and involvement of local inhabitants and their support are essential for the success of the conservation program and that the locals, first of all, should be taken into account. After that, in 1990, the *Lausanne Charter* (Elia, 2020) repeatedly recommended that the participation of indigenous people and local cultural groups is essential for the protection and conservation of cultural heritage based upon access to the knowledge necessary for decision-making, which is an important element in integrated protection. It is therefore defined that local participation should be actively encouraged insofar as the protection and management of cultural heritage should be entrusted to the local people.

In 2003, the *Convention for the Safeguarding of the Intangible Cultural Heritage* (UNESCO, 2003) recognized the importance of indigenous communities in the safeguarding, maintenance, and re-creation of intangible cultural heritage. It emphasized that the state parties should encourage the widest possible participation of communities, groups, and relevant non-governmental organizations in identifying and defining the various types of intangible cultural heritage as well as in its management.

Two years later, the *Faro Convention* (2005) mainly focused on people and human values at the heart of an expanded and multidisciplinary concept of the cultural heritage (Fojut, 2018). As highlighted in the Universal Declaration of Human Rights (Assembly, 1948), the rights related to cultural heritage are inherent in the right to participate in cultural life, in all aspects of the interaction between people and the environment through time. It defined the heritage community as the people who value specific aspects of cultural heritage which they wish to sustain and transmit to future generations. The Convention emphasizes lifelong education and training, unlimited access to information, shared responsibilities, and cooperation in the monitoring of the process of cultural heritage management and conservation. The table shows the concept of people's participation in international documents and charters (Table 1).

Table 1 public's participation in international charters

Types of Participation	Level of Participation	International Charters and Documents												
		1964 Venice Charter	1972 Heritage Convention	1975 Amsterdam Declaration	1987 Washington Charter	1990 Lausanne Charter	1996 Underwater Heritage ICOMOS	2001 Underwater Heritage UNESCO	2002 Budapest Declaration	2003 Intangible Heritage	2003 E.C.C.O Professional Guidelines	2005 Faro Convention	2005 European Cultural Heritage	2018 New European Agenda for Culture
Real Participation	Citizen Control											✓	✓	✓
	Delegation													
	Partnership			✓						✓	✓			
Symbolic Participation	Placation													
	Consultation					✓		✓	✓					
	Informing				✓		✓							
Non-participation	Therapy		✓											
	Manipulation	✓												

One of the best practical examples of public participation in cultural heritage management is the Dresden Elbe Valley case (Gaillard, 2014). The reason behind delisting the Dresden Elbe Valley from the World Heritage List in 2009 is well-known: the construction of the Waldschlößchenbrücke Bridge and its conflicted process between the World Heritage Centre and the Federal Republic of Germany. The construction of the Waldschlößchenbrücke Bridge was vital for the city. Therefore, the government decided to vote for the bridge's construction or be on the World Heritage List. It opened a debate on whether local people would be willing or not to live in a world heritage site if it was up for a vote while the construction of the Waldschlößchenbrücke Bridge was vital for the city. This situation led the Federal Republic of Germany to put the decision up for locals to vote on whether they wanted the bridge (which meant being delisted) or to designate the city as a world heritage site. Interestingly, a little over half of the eligible people participated in the referendum, with 67.92% voting for the first option. It took a long time to make the decision because of the concept of people's participation in the world heritage site and the lack of fast and

effective tools. Although no new technologies were used in the process and the whole participation process was done by the traditional method of public participation. The story of the Dresden Elbe Valley case is a fundamental step in people's participation in cultural heritage conservation and management.

2.3 People's Participation in Cultural Heritage-National Context

In order to clarify the social, cultural, and political dimensions of contemporary Iran, it is essential to take a look at the history of public participation in cultural heritage. The background of public participation in cultural heritage in Iran is tied to social and political movements dating back to the 19th century. Public participation in Iran, in general terms, dates back to the Persian Constitutional Revolution, which took place between 1905 and 1911. Based on Iranian nationalism movements, which consist of multifarious social campaigns and public participation in abolishing foreign monopolies, the Revolution led to the establishment of the Persian Constitution in 1906 as the first constitution in Iran. Accordingly, it limited the king's power and created a way to include the public in political elections.

2.3.1 Before the 1970s

The 19th century brought about transformative changes in Iran as a result of its growing ties with Europe after the Industrial Revolution. Naser al-Din Shah, a monarch known for his enthusiasm for the visual arts and languages, introduced innovative educational approaches by founding Dar ul-Funun in 1851. This institution marked a shift from traditional Islamic teaching, focusing instead on modern education across various disciplines for upper-class youth (Tahmasbpour, 2013).

In parallel, efforts were made towards international education to bridge the scientific gap with Europe. This initiative led to a fusion of Western culture and local customs. Concurrently, socio-cultural and political movements emerged, advocating for both national independence and educational advancement. These factors, coupled with challenges such as economic crises and epidemics, paved the way for the Persian Constitution Revolution of 1905 (Abrahamian, 1979).

The growing awareness among the general population, elites, and intellectuals led to an increasing emphasis on the preservation of cultural heritage. This culminated in

the establishment of the Department of Antiquities in 1910, which laid the groundwork for the first policies aimed at safeguarding national monuments. Additionally, the creation of State and Provincial Associations aimed to involve local communities in managing public affairs and protecting cultural sites (SPA, 1906).

The Society for the National Heritage of Iran, founded in 1922 by scholars and intellectuals, marked a significant step in safeguarding the nation's cultural legacy. This period also saw initiatives like the construction of the Mausoleum of Ferdowsi in 1927, funded through mechanisms such as lotteries that engaged the public in the preservation effort (RFM, 1925). Amid evolving laws and policies, the 1960s brought about greater women's rights and community engagement, as exemplified by the Law on Village Societies in 1968. According to this law, local people could participate in the development project, and they were in charge of the conservation of cultural heritage, protecting and reporting the discovered antiquities, and preventing illegal excavations on a local scale.

The lack of people's participation in cultural heritage management in pre-1970s Iran can be attributed to various factors. Despite societal changes and attempts to engage communities through initiatives like State and Provincial Associations, decision-making remained centralized among elites and politicians. Grassroots organizations were limited in scope and subject to government influence. Even public involvement efforts, like crowd-funding the Mausoleum of Ferdowsi, fell short of achieving sustained participation. Legislative gaps and political dynamics hindered progress, while the nationalist agenda of the Pahlavi regime impacted heritage preservation. Although some measures aimed to involve women and local communities, comprehensive and widespread participation was hindered by hierarchical politics, limited engagement mechanisms, legislative shortcomings, and societal dynamics.

2.3.2 After Islamic Revolution (1979)

The Islamic Revolution of 1979 was a conflict between nationalism and Islamism. The ideology of the Pahlavi dynasty (1925–79) was based on nationalism by emphasizing the history of Iran before the Islamic era and ignoring the culture and civilization of the Islamic period. They did not pay attention to the religious trend or

public enthusiasm for Islam. On the other hand, despite the ratification of a number of laws on public participation, there was no effective public engagement in practice as a result of the autocracy and power hierarchy that led to the *Islamic Revolution*.

Following that, attempts were made to involve people in decision-making processes. *Iran's Constitution of 1979* replaced with the Constitution of 1906 and amended once in 1989. It incorporated the Islamic framework into the social, cultural, and political constitutions, transferring power from the king to the ulema. It is officially written based on Islamic law and *Quran* regulations and gives power to God. Despite the fact that human rights are a principle in the constitution, if they are not detrimental to the fundamental principles of Islam, people are free to form parties, societies, and associations. They have freedom of expression "except when it is detrimental to the fundamental principles of Islam or the rights of the public. The "details of this exception will be specified by law" (Constitution, 1979). Although it appears that the Iranian Constitution is a hybrid of democratic, theocratic, and authoritarian regimes, as some researchers have pointed out (Fukuyama, 2009), it is clearly authoritarian rather than democratic, because it is impossible to interpret human rights under the shadow of religion, such as women's and LGBTQI rights (Hollenbach, 2010; Reilly, 2019).

Until 1988, eleven research and cultural organizations were in charge of cultural heritage management and conservation. The *Iran Cultural Heritage, Handcrafts, and Tourism Organization* (ICHHTO) was formed by merging the responsibilities of those eleven cultural heritage institutions. It is an educational and research institution funded and administered by the government to keep an eye on all cultural heritage activities throughout Iran. This organization was recently converted into a ministry (2018). According to the *Constitution of the Cultural Heritage Organization* (ratified in 1988), articles 20 and 21, ICHHTO is responsible for encouraging the public to participate in activities related to identifying, preserving, rehabilitating, and monitoring cultural heritage. The organization is also in charge of establishing and developing cultural heritage associations all over the country (Act, 1988).

The concept of people's participation in cultural heritage conservation has remained silent for fifteen years. The end of the war between Iran and Iraq (1980–1988) was an appropriate situation for transforming civil society and social-political development when the reformists came to power. Again, the concepts of social

freedom, respect for human rights, political pluralism, and public participation were brought to the table. Supported by the public, the government advocated for social and political changes. One of those changes was the law on forming non-governmental, non-profit organizations (NGOs). Before this time, Iran's constitution enabled NGOs to shape their various objectives. However, charity and relief aid organizations such as the *Red Lion and Sun Society* (established in 1923) have been previously successful in achieving their goals. Table 2 shows the summary of Iran's public participation in cultural heritage management after the first constitution.

Table 2 A Summary of Iran's Public Participation in Cultural Heritage Management

PUBLIC PARTICIPATION POLICY IN IRAN		APPROVED LAW	YEAR	DESCRIPTION
	After Persian Constitutional Revolution (1906-1979)	State and Provincial Associations	1906	Approved the invention of political-civil non-governmental organizations at the local level
		Law on the Establishment of Municipalities	1907	Municipalities were required to support and participate in monument and museum conservation and protection.
		law on administrative and country divisions	1907	To explain the roles and responsibilities of local government in terms of cultural heritage
		Law on the Ministry of Education	1910	Promotion of public education and cultural heritage studies; the construction of historical, scientific, and industrial museums and libraries; the supervision of archaeological excavations; and the conservation and protection of antiquities and monuments
		Society for the National Heritage of Iran	1922	Promotion, documentation, and protection of cultural heritage; ending monopolized French archaeology, establishing museums and libraries, identifying and registering all artifacts and monuments that were in need of repair or cataloging, and providing a national heritage list
		Mausoleum of Ferdowsi	1925	Public funding for construction of the mausoleum
		Law on the Preservation of National Heritage	1930	To frame the responsibilities in restoration, protection, and conservation procedures, prohibited commercial excavations, and commercial activities in museum objects
		law on returning cultural heritage objects to museums	1942	the National Bank is obliged to return its valuable historic artifacts to museums
		Law on the establishment of municipalities and associations	1947	Municipality must establish an association that is directly elected by the residents
		Law on cultural agreement between Iran and Italy	1961	To promote cultural, artistic, and scientific relations and archaeological research
		Women's suffrage	1964	Women's right to be a member of parliament and other social, cultural, and political institutions
		Law on Village Societies	1968	Local people participated in the development project, and they were in charge of the conservation of cultural heritage, protecting
	1979-2022	Constitution of the Cultural Heritage Organization	1988	ICHHTO is responsible for encouraging the public to participate in activities related to identifying, preserving, rehabilitation, and monitoring cultural heritage
		Law on institutions and activities of NGOs	2003	Development of previous procedures for registration and administrative matters
		Iran's Cultural Heritage Associations	2004	Establishment of NGOs to improve public awareness, promote consultation, motivate collaboration, and encourage cultural heritage conservation among local people

Several arguments have been made that the laws governing NGOs are burdensome and complicated. The legal framework engages different and uncoordinated centers and institutions in making a decision about NGOs. The registration process was unclear and cumbersome, and it required getting several permits to establish. Moreover, they were not distributed throughout the country because of a lack of financial resources outside of the capital. Therefore, the Ministry of Interior and the NGO communities gathered in 2003 to draft a new law on the institution and activities of NGOs that improved the function of local NGOs by providing additional financial assistance and subsidy services. This new law also developed previous procedures for registration and administrative matters (Katirai, 2004).

In this regard, the constitution of Iran's Cultural Heritage Associations (CHA) has been shaped by the ICHHTO, which is completely different from the meaning of association. As specified by the constitution, the CHAs are non-profit, national-cultural organizations dependent on the ICHHTO that can be established in cities, towns, villages, museums, and cultural heritage sites in order to improve public awareness, promote consultation, motivate collaboration, and encourage cultural heritage conservation among local people. Surprisingly, only local governmental authorities are allowed to be members of these associations. It is obvious that by using the names of associations, they established another governmental organization entitled Iran's Cultural Heritage Associations!

The concept of public participation has never been established in Iran. The main reasons behind this are the dependency of local authorities on governmental resources, the lack of concrete theoretical knowledge on public participation and decision-making and its implementation amongst political, social, and academic elites, and policymaking at the national level (centralized government) without considering the role of locals (Jajarmi, 2017). In order to establish effective public participation, it is necessary to have a basic form of democracy and freedom. Freedom "cannot be judged in absolute terms but only in relation to power: the power to act, the power to understand the consequences of action, and the power to critically reflect and evaluate desires in terms of their consequences; in short, the power to assert control" (Wright & McCarthy, 2010).

2.4 The Emergence of Users' Participation in Computer Sciences

Although people's participation in cultural heritage management is relatively a new concept, it has been well-developed in other interdisciplinary and multidisciplinary sciences that cultural heritage studies can borrow and implement. Human-Computer Interaction provides valuable experience in user engagement in designing a system or service that is applicable to people's participation in cultural heritage management. Why not use the HCI approach in cultural heritage if people are the true users of cultural heritage and cultural heritage management and conservation is a service for people?

Before the emergence of Web 2.0, public participation was based on face-to-face communication in the forms of interviews, meetings, workshops, voting, etc. (Gilman, 2022). In 2011, *The Recommendation on the Historic Urban Landscape* (The HUL Recommendation) highlights the implementation of traditional and innovative tools adapted to local contexts, including civic engagement tools, knowledge, and planning tools, regulatory systems, and financial tools. HUL also emphasizes the integration of cultural heritage conservation, management, and planning strategies into local development processes at a local level to bring about effective protection of natural and cultural heritage. These tools aim to engage a diverse cross-section of stakeholders in order to empower them; protect the integrity and authenticity of attributes; reflect social, environmental, and cultural values; and support innovative income-generating development (UNESCO, 2011).

The importance of citizen participation in decision-making processes has been recognized for a long time. In the 1960s, citizen participation programs were launched at all levels of government with the underlying assumption that if citizens became actively involved as participants in their democracy, the governance that emerged from this process would be more democratic and effective (Irvin & Stansbury, 2004). This idea has since spread to other disciplines such as industry, urban planning, computer sciences, and human rights.

Up until the late 1980s, management principles that governed the process of program design were a major influence on most programs in the field of computer

science. The method they used was called the waterfall model, which means the management designed a program with no input from those we today call users. The waterfall model is a linear approach to software development that breaks down the development process into distinct stages. Each stage must be completed before the next phase can begin, making it difficult to go back and make changes to a previous stage without potentially impacting later stages (Sherrell, 2013). This approach was useful for projects where requirements were well-defined and unlikely to change, but it could be inflexible for projects where requirements were likely to change or evolve over time.

The concept of users has emerged with the appearance of micro, mini, and desktop computers. In the early 1980s, when Computer-Human Interaction attempted to find "how the interfaces could be designed for users", HCI was established on traditional programming, including a set of procedures to help designers think about users' thoughts. Instead of involving users in the process, they asked users to test out an interface, and they focused on eye movement or keystrokes (Dix, Finlay, Abowd, & Beale, 2003).

This concept developed when new technologies were introduced in the workplace, for instance, using computers in companies based on knowledge-based strategies focused on standardizing and simplifying interfaces. Although the management procedures were widespread, the Scandinavian workers' movement led to workers' rights to information and codetermination over the work conditions. Consequently, different action projects have been launched to bridge the gap between new technologies and users (Kensing & Greenbaum, 2013).

2.4.1 Human-Computer Interaction and Participation

HCI includes a wide variety of methods and processes for the involvement of users in designing a system, such as action research, cooperative system design, user-centered design, codesigning, experience-centered design, participatory design, community-based participatory design, respectively. The concept of involving the users in the design phase originally dated back to the 1970s, when Scandinavian countries encountered a worker movement to deal with the problems raised by utilizing new technologies in the industry. Since then, researchers have attempted to involve the final

users in the design process as early as possible in order to empower workers (Bødker, Ehn, Sjögren, & Sundblad, 2000).

2.4.1.1 Action Research

According to Kurt Lewin (1890–1947), action research is a study that compares the circumstances and results of various types of social action and research that supports social action, which is an iterative process of planning, action, and fact-finding about the result of the action. He argued that planning in general terms begins with a general idea that must be examined in the first place by a fact-finding process. Consequently, the next two steps will be identified; the overall plan and how to execute the first step of the plan. He highlighted that in social management, planning, action, and fact-finding must proceed in a spiral of steps (Lewin, 1946). Later on, action research was widely used in HCI.

Action research in HCI refers to a set of actions to be executed within a community engagement in order to enhance the quality of life and social well-being. During this community collaboration, the research questions, data analysis, and processes are created, which needs people's commitment to be involved equally in all stages of the research (Hayes, 2011). Similar to grounded theory (Glaser & Strauss, 2017), knowledge and learning emerged through the research. Action research is typically action-focused and its method is participatory. In grounded theory, the researcher theorizes but the actions are left to the people. Action research requires establishing a relationship cycle between the researcher and the participant (Dick, 2003). Some researchers argue that action research is research with people rather than for or about people. However, it is effective in specific contexts and at local levels (Heitlinger, 2017).

2.4.1.2 Cooperative System Design

Cooperative or participatory design is looking for a way to establish a collaboration of people with various skills in designing a system by highlighting workplace activities from multiple viewpoints. It requires users and designers to actively work together. It tried to combine the Scandinavian and American philosophies in participatory design (Simonsen & Robertson, 2013) to support and promote users' interests through an

interdisciplinary study, including humanities, social sciences, and computer science. They indeed emphasized human actors rather than human factors (Sommerville, Bentley, Rodden, & Sawyer, 1994).

2.4.1.3 User-centered Design

In the United States, the user-centered design emerged in the 1970s when people were allowed to participate in the informing, ideating, and conceptualizing activities in the design phase, which led to the evolution of the co-designing process. The co-design process emphasized that user-centered design from an expert's perspective was the central purpose. This approach tries to involve trained researchers in collecting data from passive users who participate in instructed tasks and/or provide their opinions on product ideas that were primarily created by others. The method is distinguishable from the expertise and attitudes of the practitioners. The users have been modified as the customers, and the focus has been shifted from product and service to personalized consumer experiences. This method allowed people to customize their own goods or services. The participants were carefully selected among elite groups, and the roles of user, researcher, and designer have changed (Norman & Draper, 1988).

The users in the user-centered design are active. The researchers extracted knowledge from theories, observations, and interviews. Then the designers added their technological knowledge to the design process. The researchers facilitated the different levels of creativity by leading, guiding, and providing frameworks to encourage people to participate in the process. Designers were responsible for undertaking creative processes, filling in the gaps left by lacking information and being able to make critical decisions in the absence of all the information they needed (Sanders & Stappers, 2008). These changing roles raise various issues. For instance, participants have different levels of creativity; thereby, they need appropriate tools to express their creativity. In this case, it is required to involve a specific group of people who may not represent the majority. Moreover, it is not possible to listen to the voices of marginalized people who are deliberately ignored. The researchers require a high level of social skills to lead, guide and frame the participants in the different levels of creativity. Although user-centered design became widespread in the 1990s, it was not able to address the complexity of design in the next decades. However, it has driven the design process in the new landscape such as interaction design, service design, and transformation design

based on applying traditional design techniques to social and economic challenges (Sanders & Stappers, 2008).

2.4.1.4 Co-designing

Designers aimed to not only communicate with potential users to understand their needs and desires, but also to actively engage them in the design process. The results showed that there are probably different meanings from system designers' perspectives as outsiders and people involved in day-to-day activity. In addition, engaging people to take part creatively in design activities is completely new to users and is not easy. The users and designers are not able to entirely understand each other, thereby it requires them to close their experiences together. Greenbaum and Kyng (2020) provided several ideas to bridge the gap between users and designers, including mutual learning; using familiar tools for the users in the design process; considering the users' experience and the effect of using new designs on work practice; and starting "the design process in the practice of the users" (Greenbaum & Kyng, 2020).

2.4.1.5 Experience-centered Design

Peter Wright and John McCarthy (2010) expanded on user-centered design and codesigning to include the ethical and political ideals of democracy, equality, and choice in the design process. They emphasized the richness of human experiences with available technologies as new technologies like mobile computing, social media, and localized-customized applications emerged. Because of the widespread use of computers in family, social, community, and leisure life, experience-centered design is more focused on people lived and felt experiences that are mediated by digital media and new ways of communication and information sharing. The approach concerned "giving people the chance to have a richer life, including people who might otherwise feel excluded, and ensuring that everybody has a chance to have their say, especially those who often feel voiceless" to make new technologies accessible and usable for everybody.

Experience-centered design attempted to reflect people's desires, values, and feelings in the design process to create a usable, effective, efficient, satisfying, and easy-to-learn product. In this respect, it requires developing a transparent and simple computer interface. The designers and developers also need to have a deep

understanding of what end-users really want; how they currently get their work done; and whether they understand and use the system that will be designed for them. Some scholars in experience-centered design highlighted the importance of the user experience by considering the fact that "all experiences grow out of previous experiences and help shape future experiences; that is that experience as a process is both continuous and cumulative." This method is applicable in diverse disciplines, ranging from social actions, health, and cultural heritage to the education system, art galleries, and museums (Wright & McCarthy, 2010).

According to Wright and McCarthy (2010), the essence of human and human-computer interaction (HCI) interactions lies in several key points. First, it involves understanding how individuals interpret their experiences. Second, it recognizes both the user and the designer as co-creators of the overall experience. Third, it acknowledges individuals as part of a social network of relationships (self-other) where experiences are co-constructed. Lastly, it identifies individuals as caring agents capable of envisioning opportunities, making original decisions, and taking action.

These principles are fundamental to the concept of experience-centered design. By focusing on how individuals perceive and interpret their experiences, experience-centered design aims to create meaningful and user-centered solutions. It places great importance on understanding human values, desires, and genuine needs during the design process.

However, one challenge is that there is no standardized or universally accepted approach for implementing experience-centered design. As a result, designers and researchers have to develop their own research approach and style to effectively apply this method in practice. This individualized approach can make the process more complex and requires adaptability and creativity to tailor the method to specific contexts and user requirements. Despite this complexity, experience-centered design offers valuable insights into human experiences, enabling designers to create more empathetic and relevant solutions.

2.4.1.6 Participatory Design

According to the International Handbook of Participatory Design, (Simonsen & Robertson, 2013), participatory design is defined as "*a process of investigating,*

understanding, reflecting upon, establishing, developing, and supporting mutual learning between multiple participants in collective reflection-in-action. The participants typically undertake the two principal roles of users and designers, where the designers strive to learn the realities of the users' situation while the users strive to articulate their desired aims and learn appropriate technological means to obtain them". The participatory design approach is looking for genuine participation in design. It believes that former traditional user empowerment methods such as user-centered design and one-way data gathering are not able to achieve genuine participation (Kensing & Greenbaum, 2013). Participatory design is a comprehensive series of research, methods, and theories on the inclusion of affected people by a system in the decision-making processes.

2.4.1.7 Community-based Participatory Design

One of the relatively recent themes in participatory design is community-based participatory design, which focuses on designing for, with, and by communities. There is an ongoing trend in system design towards producing lower costs, smaller sizes, improved capacity, stronger connectivity, and deeper penetration into everyday life. These advancements provide the potential to apply participatory design approaches in community contexts. This technological trend, accompanied by the importance of social services and civil society, is able to address societal issues including sustainable development, environmental protection, cultural heritage preservation, medical service, and so forth. According to DiSalvo et al. (2012), this approach went out of context and addressed issues of the formal organizational workplace, such as factories, offices, hospitals, etc.

The internet of things and new media provide an opportunity to implement an innovative approach to effective user interaction. Through human-centered design, museums and cultural heritage institutions are also seeking a way to engage visitors in their exhibitions. The human-centered design aims at designing an exhibition or art gallery based on visitor needs and interests. This method extensively applies new, innovative, and interactive technologies such as video walls, touchscreens, interactive flipbooks, and video components to encourage visitors to engage (Hanlee, 2019). Unfortunately, museums and cultural heritage institutions often prioritize visitor

interpretation and engagement in order to attract more visitors, rather than encouraging the participation of local communities in conservation and management processes.

For example, community-based participatory research is one of the approaches extracted from community-based participatory design. Like the community-based participatory design, this process is a collaborative method of research driven by equitable partnerships of community members, academic researchers, and organizational representatives. This partnership framework aims to increase "the value of the research product for all parties." This approach facilitates the translation of research and leads to positive and sustainable community improvement. Despite the fact that community-based participatory research has been extensively applied in the public health research (Coughlin, Smith, & Fernandez, 2017), it is capable of being implemented in other cultural and social contexts. These terms are also defined as synonyms of community participation, including "citizen oversight; citizen participation and bottom-up planning; civil society; collaboration; community deliberation; community development; community empowerment; deliberative democracy; open government; public participation; public policy" (Lachapelle & Austin, 2014). In this research, the author has borrowed this approach from HCI and public health research in order to adopt it in the cultural heritage context.

The epistemology and methodology of action research, participatory design, and community-based participatory design have been merged together to establish socially engaged art practice by emphasizing the ethics and aesthetics of sociocultural interaction in the form of social events including workshops, performance arts, and involving communities. Based on the nature of this approach, it provides a method for better understanding the current and future complex challenges, including climate change, environmental sustainability, immigration, and population issues, aimed at improving public awareness about sociocultural problems (Clarke, Briggs, Light, Heitlinger, & Crivellaro, 2014).

2.4.2 Digital Platforms and Cultural Heritage Institutions

In the digital and social media age, people are accustomed to using portable internet devices instead of desktops. Smartphones and their applications are a new and rapidly expanding industry and they have a global positive impact. They are running on small

hand-held mobile devices which are transportable, simple to use, and accessible from anywhere and at any time. Consequently, a large number of people use mobile applications for contacting friends, browsing the internet, file management, document creation, entertainment, and so on (Islam, Islam, & Mazumder, 2010).

Today, the current world population is 7.937 billion. While 7.26 billion have mobile phones (including both features and smartphones), around 6.648 billion are using smartphones. It means that 83% of people around the world have access to smartphones. Surprisingly, the mobile connections rate is 10.57 billion, which means "there are 2.64 billion more mobile connections than people worldwide" (BankMyCell, 2022). There are 1.8 billion active iOS (Warren, 2022) and 2.5 billion active Android mobiles in the world (InMobi, 2021). According to Statista, more than two billion users are world widely using Android. More than 230 billion mobile applications have been globally downloaded in 2021, and a little bit more than 90% of users used chat applications in the third quarter of the same year. On average, consumers spent around 8 Euro on mobile applications in the second quarter of 2021 (Statista, 2021).

In Iran itself, among the total population (84.52 million in January 2021), less than 60 million have access to and are using the internet. In addition, more than 131 million mobiles have been officially registered by the end of 2020 which is equivalent to around 155% of the total population (Kemp, 2021). While Facebook, YouTube, Telegram, Twitter, Blogger, Snapchat, Netflix, Hulu, and Medium are fully blocked, but still 36 million are using these social media. In 2020, individuals using the internet are 84.11% of the total population (W. B. Group, 2020).

Web 2.0 (participatory Wen, people-centered Web, Social Web, and read/write Web) provides a more interactive collaboration in engaging the users more effectively in user-generating content. It consequently formed social media such as Myspace, Flicker, YouTube, Wikipedia, Facebook, and other sorts of social applications (Murugesan, 2007). Onward, many cultural heritage professionals, institutions, and scholars are using social media as a tool for public participation in order to have a community-based platform for facilitating users' interaction with cultural heritage. Social media likewise works as crowd-sourcing and big data resources. A large number of museums and cultural heritage institutions are using social media. Typically, users

can upload and share their images and stories or comment on a specific post (Ginzarly, Roders, & Teller, 2019).

2.4.3 COVID-19 Pandemic

According to the International Telecommunication Union (ITU) report, it is estimated that 4.1 billion people (more than 53%) have connected to the internet by the end of 2019 (ITU, 2021) and the COVID-19 situation in early 2020 has increased the number of users during the block out time. In order to avoid the Coronavirus, more than 85,000 cultural heritage institutions worldwide (around 90%) closed their doors and nearly 13% of museums may never reopen their doors. Besides the economic impact of these closures, it has particularly affected social life. The museums are playing a vital role in promoting education, inspiration, and dialogue. They also enhance social cohesion, foster creativity, and are conveyors of collective memory. In addition, they are a key driver in the sustainable economic development (UNESCO, 2020b).

During the quarantine, mostly between February and July 2020, the cultural heritage institutions inevitably brought their life to the internet. The main "real" activities of the museums have had to transform into the 'virtual'; online collections, 360° tours, virtual museums, online publications, digital exhibitions, remote participation, etc. Consequently, museums have increased their activity on the internet in order to keep interacting with their users. In Canada for instance, according to Ontario Museums Associations' website (Association, 2020), there are more than 650 cultural heritage organizations in Ontario itself. Among them, 642 organizations are accessible via the internet, and a bit more than 80% are utilizing social media platforms, according to their websites. Based on this online survey, the most favorable platforms for those organizations are Facebook, Twitter, Instagram, YouTube, LinkedIn, Pinterest, and Flicker, consecutively. A bit less than four out of five have an institutional page on Facebook, 64% on Twitter, and half of them are available via Instagram. The proportion of YouTube and LinkedIn are approximately 35 and 10 percent, respectively. The ratio of other social media platforms like Pinterest, TripAdvisor, and Flicker is just 5%. While around one-fifth of cultural heritage organizations do not appear on the internet, 82% have more than one profile on social media and again Facebook is on the top. The majority of organizations have more than three links to their social networks.

2.4.4 Social Media and Cultural Heritage Institutions

Although cultural heritage organizations are increasingly using social media as a tool for community engagement purposes over the world, the problem is that mentioned social media are not able to meet the demands of the community engagement approach. The Royal Ontario Museum has 118,848 followers on the Facebook page (royalontariomuseum-ROM, 2020), for example. By considering the last one hundred posts between March 27th and August 12th, 2020, the midpoint of likes and comments are 90 and 6 per post respectively, and the engagement rate is 0.08. On Twitter, the situation is even worse. More than 205,400 people are following the ROM Twitter page (ROMtoronto, 2020), surprisingly, the average number of comments on the last hundred Tweets, between May 5th and August 12th, 2020, is 0.85, not even a single comment for each Tweet. The midpoint of likes is around 22 per Tweet. The engagement rate is 0.01 per tweet. This situation is not related to the size and to fame of the cultural heritage organizations. For instance, more than 2.5 million people have followed the Louvre Museum page on Facebook (museedulouvre, 2020). The average like and comments are 3141 and 100 per post and the interaction rate is 0.12%. This museum has also more than 1.4 million followers on Twitter (MuseeLouvre, 2020). The midpoint of likes and comments are 177 and 0.22 respectively. The interaction rate is 0.012! Another example is the Guelph Museums in Ontario, Canada. The Guelph Museums profiles are accessible through the Facebook (guelphmuseums, 2020) and Twitter (guelphmuseums, 2020). The average of likes and comments per post (the last hundred posts between April 18th and August 16th, 2020) on Facebook with 2,409 followers are 12 and 0.6 respectively. The ratio of interaction is 0.49 with 4,017 followers on Twitter, and the proportion of likes and comments is 7.8 and 0.27 percent, for the last hundred tweets between March 31st and August 16th, 2020. Here, the interaction ratio is 0.19%, much higher than the average (Table 3).

Table 3 engagement rate of three museums on Facebook

Table 3

Cases	Facebook Followers	Average Likes	Average Comments	Engagement Rate	Average Rate
Royal Ontario Museum (CA)	118,848	90	6	∇0.08	0.21
Louvre Museum (FR)	2,569,076	3141	100	∇0.12	0.21
Guelph Museums (CA)	2,409	12	0.6	∆0.49	0.21

The interaction rate (or engagement rate) is the number of interactions (like, comment and share) divided by the account size which is the number of followers (Garmur, 2020). According to Statista, during the second quarter of 2020, the average Facebook page fan engagement with posts on a page was 0.21. Video posts drew the highest level of engagement from page fans, having an interaction rate of 0.26 percent (statista, 2020). In general, the engagement rate on Twitter is 0.08 (Table 4).

Table 4 engagement rate of three museums on Twitter

Cases	Twitter Followers	Average Likes	Average Comments	Engagement Rate	Average Rate
Royal Ontario Museum (CA)	205,400	22	0.85	∇0.011	0.08
Louvre Museum (FR)	1,400,000	177	0.26	∇0.012	0.08
Guelph Museums (CA)	4,017	8	0.27	∆0.19	0.08

Despite the growing use of online tools to engage the public, in many cases, the number of participants is too low, most participants engage infrequently and the connection between participation and authorities is unclear. There are also important concerns regarding the level of participation, unequal power among participants and between participants and authorities, and lack of online civic engagement skills (Lyons, 2017). **Moreover, these so-called social media are not originally designed for community engagement purposes** (Dollarhide, 2019). Thereby, they are not able to be used as a comprehensive tool in different steps of community engagement. These steps mostly are informing the community, exploring and explaining the projects or issues, opening a discussion room, obtaining feedback, collecting data, building capacity, developing collaboration, and making a clear decision. Internet-based engagement enhances the techniques utilized to engage the community, it is not a replacement (Lyons, 2017). Undeniably, it must not be forgotten that the values of social media lie in improving users' knowledge and understanding of cultural heritage as well as raising public awareness, which is an effective medium in a social, cultural, and political campaign functioning as a virtual public space. **Thus, it is clear that social media are inappropriate technology for achieving the purposes of a people-centered approach in cultural heritage management because these platforms are not able to meet the needs and interests of involved stakeholders in cultural heritage issues**.

2.4.4.1 Digital Platforms and People Participation in Iran

Before the wide spread of smartphones as a means of connecting to the internet and social media networks, the government and authorities formed the people's opinions and ideas about cultural heritage issues through the media (including newspapers, TV, etc.). The state selected what information was publicly published, and people's understanding of the cultural heritage was related to their personal experiences and the media channel they chose to consume. One of the best examples of how the media forms people's ideas about social and cultural phenomena is the case of the demolishing of cultural heritage in Iran after the Islamic Revolution. In the days after the revolution, revolutionaries went out to destroy all signs of the fallen government, which were made part of cultural heritage properties by the new regime's propaganda. Almost all statues have been eliminated. They would even like to destroy the Persepolis World Heritage Site. Thanks to the local people who did not allow them to do that (Masoumi, 2015). If social media and mobile internet connections had been accessible at that time, there is a possibility that some cultural heritage properties could have been better protected and their destruction might have been mitigated.

An example of cultural heritage destruction before the emergence of social media and public use of the internet is the destruction of the oldest Persian hammam in 1995. The municipality of Isfahan destroyed the building overnight and turned it into a street. With news silence and limited access to information, no public demand was formed. Khosrow Agha Hammam was designated on Iran's national heritage list in 1974 as an architectural masterpiece but the municipality as the local government quietly wiped it out (Shirazi, 1995). The case of the oldest hammam is comparable with the cultural heritage issues in Isfahan after the internet was widespread.

Meidan Emam, located in the heart of Isfahan, was inscribed on the UNESCO World Heritage List in 1979 (UNESCO, 2020a). The conservation of this world heritage site is guaranteed by core and buffer zone policies. The Municipality of Isfahan again constructed a huge commercial complex within the conservation protective zone of Isfahan's historic city. This high-rise building threatened the skyline of the historic city by going beyond the maximum height limitations policy. It was a long challenge between Iran's cultural heritage organization and the Bureau of the World Heritage Committee about this issue. The Bureau requested to organize a joint mission by

ICOMOS experts to find ways to "minimize the negative impact of this illegal construction with the concerned authorities during the stakeholders' meeting" (UNESCO, 2020a). The decision was to destroy the extra levels of the commercial complex; otherwise, the world heritage would be delisted. As a consequence, a virtual movement has formed via digital platforms such as internet news networks, Facebook, Viber, etc., that forced the authorities to accept the first choice. It shows that information flow provides an effective tool for engaging people in dealing with the protection of cultural heritage.

It has been argued that the information flowing through the widespread use of the internet acted as an effective tool in people's involvement in cultural heritage conservation. Iran was the second Middle Eastern country to provide internet service after Israel in 1993, and it is currently ranked 14th worldwide in terms of internet users (Statista, 2022). In Iran, as in other parts of the world, there has been a sharp trend in the use of the mobile telephone. During the eight years between 2002 and 2010, the penetration rate of mobile phones rapidly rocketed from 5% to 91%. Even though the invention of handheld computing dates back to 1984, it took a little bit less than twenty years to become the current smartphone (Park, Parwani, Satyanarayanan, & Pantanowitz, 2012). Now, there are more than 72 million internet users there, and around 50 million people are using social media (Kemp, 2021). Just 40 million people are solely using Facebook (while it has been filtered since 2007-2009), and the internet users' penetration rate is 91% (M. M. Group, 2022). According to Statista, 127.62 mobile numbers were subscribed to by the end of 2020 in Iran, and the smartphone penetration rate was 62.9%, the tenth country in the world.

2.5 Summary

This chapter provides a review of the literature on the participation of people in cultural heritage, both on a global and national level. Moreover, it explains the most important terms, core values, and principles related to how people take part in cultural heritage. It also talks about how people participate in cultural heritage around the world and how important it is for communities to be involved in managing cultural heritage.

After looking at how people are involved in the preservation and management of cultural heritage in international charters and documents, it looks at how people are

involved in cultural heritage in Iran. The section is divided into two parts: Before the 1970s and after the Islamic Revolution of 1979. The first part highlights the role of the government in heritage preservation and the lack of community involvement during this period. The second part explores the changes in cultural heritage management after the revolution, with an emphasis on the growing importance of community participation.

This chapter also talks about the rise of user participation in computer science. It does this by giving an overview of human-computer interaction and participation and pointing out how important it is for users to be involved in designing and making digital platforms. The section also explores the use of digital platforms in cultural heritage institutions, discussing the ways in which these platforms can facilitate user participation in heritage management.

3 Chapter Three: Methodology

This research aims to answer two main questions. Given that cultural heritage institutions are using mobile apps for social networking, communication, and interactive tools more and more:

How can we develop a mobile application that can be used as a tool to facilitate the interactions between cultural heritage institutions and local people in the protection of cultural heritage sites?

How can a participatory approach to cultural heritage conservation and management be applied, given that public engagement is critical to the long-term preservation of cultural heritage?

To address the research questions, a fundamental framework was established and subsequently exemplified through a specific case study. The chosen case study involves a small-scale community residing and operating within the landscape vicinity of the Bisotun World Heritage Site. This approach allows for a deeper comprehension of collaborative efforts in preserving cultural heritage. Moreover, it provides an avenue for progressing beyond the stage of formulating strategies to engage individuals toward a more intricate stage where the community collectively crafts strategies for its own betterment. Here, the intention extends beyond developing a single application, such as a mere citizen-centric app. Instead, the emphasis lies on constructing a comprehensive theoretical framework, underpinned by empirical insights derived from the chosen case study. The framework is applicable to other cultural heritage sites.

In the context of cultural heritage management, this point of view makes us wonder how a community-based participatory method could be used to make a smartphone app. The question inevitably brings up the following sub-questions: Which methods are appropriate for an effective and successful community-based participation approach? What are the issues and opportunities of community-based participatory research when working with the local community? And how is human-computer interaction (HCI) able to support designing a mobile application? This chapter outlines the data collection methodology, which is rooted in a combination of human-computer interaction and community-based participatory research, and thematic analysis for evaluating the collected data.

3.1 Objectives

The main goal of this study is to come up with a way for people in the community to take part in cultural heritage conservation and management through a mobile app. The methodology was developed in response to the research questions: how can a participatory approach to cultural heritage conservation and management be applied, given that public engagement is critical to long-term cultural heritage conservation? Also, it's clear that a project that involves the community needs a platform to make it easier for the many people involved to talk to each other. At cultural heritage institutions, we now use mobile apps that make social networking, communication, and participation easier. How can we make a phone app that can be used to get people interested in preserving cultural heritage?

3.2 Data Collection

The author chose a group of human-computer interaction methods that are similar to those used in community-based participatory design. Applicability was another concern in using human-computer interaction methods in community-based participatory design. Only the methods of human-computer interaction that could be used in a participatory way have been chosen.

The rationale for employing mixed methods rests on the principle of involving local residents, who will undoubtedly be impacted by the design of a system (in this case, iCommunity), in the design process. Additionally, this approach provides a platform for amplifying diverse and often underrepresented perspectives during the design phase. Through the application of community-based participatory design methodologies within the context of cultural heritage conservation, the Bisotun World Heritage Site not only establishes a digital platform for engaging with the local community but also fosters an environment conducive to reshaping and strengthening the interactions between the cultural heritage institution and the local populace. This, in turn, enhances the overall quality of life for the residents.

The research was conducted in the context of a small-scale cultural heritage institution where the Bisotun World Heritage Site has been occasionally working on different methods and levels of community-based engagement. The researcher had a chance to conduct his studies on site for eight months as a secondment. These eight

months of working there took place over two trips. The first placement lasted about six months, between March and August 2021, and the second secondment lasted two months, in July and August 2022. The author initially anticipated involving 20–25 participants during the interview phase, yet the final count of participants exceeded expectations, reaching a total of 37 individuals.

3.2.1 Human-Computer Interaction Methodology for Data Collection

In this research, several methods from Human-Computer Interaction research were employed for data collection and evaluation. These methods include formative evaluation, scenario-based design, prototyping, the collection of user opinions through interviews and focus groups, user observation and monitoring, and predictive evaluation through heuristic evaluation and mobile application heuristics.

Formative evaluation involved describing the use of a future interface through sketches, images, text, etc., based on the real needs and interests of the users. A prototype was then created as a draft version of the interface to be tested by system analysts and users in order to evaluate and enhance its functionality and precision. The app serves as a means of implementing and demonstrating a more abstract idea, and is used to evaluate its effectiveness.

User opinions were collected through interviews to gather self-reported experiences, opinions, behavioral motivations, and preferences about the interface. Focus groups were also used to facilitate structured discussions among a group of five users about their expectations, opinions, preferences, functions, and visual interface.

User observation and monitoring involved observing users while they worked with the interface in their natural environment to understand how and why they did what they did. Predictive evaluation was conducted through heuristic evaluation by experts in software engineering or computer science to test the user interface and identify problems based on classified usability principles. Mobile application heuristics were also used, which modified previous heuristics for smartphone mobile applications. Table 5 provides an overview of the methods that were employed in this thesis.

Table 5 An overview of the mixed methodology used in this research

		TECHNIQUE	METHOD	DESCRIPTION
METHODOLOGY	Human-Computer Interaction- Data Collection	Formative Evaluation	Scenario-based design	After discovering the real needs and interests of the users, the use of a future interface is described in sketches, images, text, etc.
			Prototype	A draft version of the interface to test and try by system analysts and users in order to evaluate and enhance functionality and precision.
		Collection of User's Opinions	Interviews	To collect self-reported experiences, users' opinions, behavioural motivations, and preferences about the interface.
			Focus group	A structured discussion in a group of 4 about users' expectations, opinions, preferences, functions, visual interface, etc.
		User Observation and Monitoring	Observing users in the context	Observing the user or users while they work with the interface to find out how and why users do what they do in the user's environment.
		Predictive Evaluation	Heuristic evaluation	To test the user interface and discover the problems based on classified usability principles by 5-6 experts in software engineering or/and computer science
		Mobile Application Heuristic	SMART	The mobile applications' usability heuristics were modified from the previous heuristic evaluation for smartphone mobile applications.
	Data Analysis	Thematic Analysis	Familiarizing with Data	Being familiar with the data collected by interviews, focus groups, and observation.
			Generating Codes	The codes are extracted from both semantic and latent contents and were organized into meaningful groups.
			Searching for Themes	The different codes are sorted into potential themes and are collated within the identified themes.
			Reviewing Themes	This phase is reviewing the themes in order to get rid of redundant themes that have not enough data to support and highlighted the evident themes.
			Defining and Naming	Defining and refining the themes that are presented in the data analysis by giving a name to each phase.
			Producing the Report	The data analysis is reporting to tell the stories behind the themes

3.2.1.1 Formative Evaluation

Formative evaluations help the designer improve the interface before production. They assess whether all aspects of the system work well or not. It may also change some parts of the interface to make it as useful as possible. Formative evaluations can answer questions like what kinds of usability problems the interface has, if users understand how to navigate, and if the interface follows well-known usability principles (A. Joyce, 2019). There are four types of formative evaluation, including mock-ups, Wizard of Oz simulations, scenario-based design, and prototypes. In this research, scenario-based design and prototype techniques have been implemented.

Scenario-based design: This method shows existing activities or plans for new ones by showing the user's actions step by step. The designer can use different forms of visualization, such as text, images, sketches, etc. The technique aims to organize the data during observation and brainstorming (Carroll, 2003)**.** The scenario-based design also simplifies the design of the application in the prototype phase.

Prototypes: The design process of prototyping is an iterative design that examines the usability and accessibility of the interface to understand how it can be improved (Wright & McCarthy, 2010). Prototyping is a rough version of the product that lets the designers show their ideas on paper or on a computer screen. The paper-based prototypes are static, which are generally sketches, screen images, and text on paper of what the interface looks like, like a storyboard. The digital form of prototyping is an interactive, software-based technique. In this method, the prototypes simulate and form by using computer software to design an interface to show their look and feel.

In mobile application prototyping, there are a number of programs that allow us to work on user interface prototyping. An interactive, software-based smartphone application has been prototyped by Adobe XD software in order to depict the ideas of how to use the mobile application for community participation in cultural heritage conservation. Adobe XD is a vector-based design platform that is easy to use and lets us create, organize, animate, and share digital versions of our ideas (Rae, 2020).

3.2.1.2 Collection of User's Opinions

The approach employed in this study involves a mixed-qualitative method centered around community-based participatory research (Coughlin et al., 2017). This method aims to capture user opinions and perceptions about the iCommunity prototyped application, shedding light on aspects that the initial design might have overlooked.

Various techniques for collecting user opinions, such as interviews, questionnaires, focus groups, and user evaluations, were utilized. In the context of this research, a mixed-qualitative approach was adopted, combining interviews, focus groups, interventions, and controlled design. Interviews were used to gather detailed accounts of users' experiences, motivations, preferences, and insights (Dix, 2015). Local residents, intimately familiar with their environment, shared their firsthand knowledge and experiences, unveiling both known and latent information. Furthermore, interviews provided a platform to uncover perspectives that stakeholders and experts might not have considered.

Focus group discussions, facilitated by a trained leader, provided an avenue for a structured discourse on specific topics. Participants, chosen for their relevance and willingness to engage, offered diverse viewpoints and opinions (Dix, 2015). Although

there isn't a universal consensus on the number of participants or session duration, experience suggests that sessions involving 4 to 6 individuals lasting around 2 hours are common.

While user opinion collection significantly contributes to Human-Computer Interaction research, it's important to note that it can complement user observation and monitoring to provide a comprehensive understanding of user interactions and experiences. Addressing the reviewer's feedback, the methodology section will be revised to provide a clearer delineation of the methods employed and their specific application within the study.

3.2.1.3 User Observation and Monitoring

In this research, observing users in context was applied during two periods: from March to August 2021 and from July to August 2022. This method, a type of ethnographic research, involves observing and interviewing a small group of users to understand their practices and behavior while using the product. It is based on two factors: inquiry and context. Inquiry involves observing the user or users while they perform their tasks to understand how and why they do what they do. Context refers to the natural environment where users live or work with the product, such as at home or at work (Salazar, 2020).

The iCommunity prototype application was tested at various stages of development using think-aloud protocols and observing users in context until saturation was reached. Think-aloud protocols involve asking users to verbalize their thoughts and actions while using the product, providing valuable insights into their thought processes and decision-making.

3.2.1.4 Heuristic Evaluation

The predictive evaluation aims at making predictions based on expert users' evaluations in order to avoid and discover errors that occurred in the interactive systems without performing experimental evaluations. The main methods in this technique are heuristic evaluation and domain expert appraisals, of which the first is applied in this research but the second is not. "Heuristic evaluation is a usability engineering method for finding the usability problems in a user interface design so that they can be attended

to as part of an iterative design process. Heuristic evaluation involves having a small set of evaluators examine the interface and judge its compliance with recognized usability principles (the heuristics)" (Nielsen, 1994).

This approach is totally different from usability testing. The heuristic evaluation method is more helpful when we are working on a mock-up application (a prototype). In heuristic evaluation, the inspectors are those who are working in the software engineering or/and usability or human factors domains (Muller, Matheson, Page, & Gallup, 1998), test the user interface, and discover the problems based on a classified form. In this case, the experts measure the usability of the user interface and report the issues. In heuristic evaluation, the observers have the willingness to evaluate the interface and find the errors (Nielsen, 1994). But in usability testing, the real users use the interface with real tasks, and the errors are true problems because at least one of the real users encountered the problem. The number of evaluators is the key point of the heuristic evaluation. Several studies show that a single evaluator is able to find only 35 percent of usability problems in interfaces. The performance of this technique dramatically increases when more than one evaluator is used. These studies also indicate that the optimal number of evaluators is between three and five, and it does not work fundamentally with fewer than three.

In 1990, Rolf Molich and Jakob Nielsen published their heuristic evaluation method entitled 'Improving a human-computer dialogue' (Molich & Nielsen, 1990) and this technique has been developed by Nielsen since then. He proposed 10 general principles for user interface design, which they called heuristics because they were general rules and not specific usability guidelines, as follows:

Visibility of System Status

The first principle suggests that "the users must be kept informed about what is going on through feedback within a reasonable amount of time" (Nielsen, 2020). This principle is achievable based on informing the users through continuous communication between the system and the users. The feedback to the users must be given as quickly as possible, ideally, immediately. This continuous communication leads to trust building, which is a fundamental key in the community participation approach.

Match Between the System and the Real World

The interface should use words, phrases, and concepts familiar to the users. It should provide information that appears in a natural and logical order. The key point of this principle is ensuring users can understand the meaning of words and features used in the interface. Most often, there is a misunderstanding of words and/or concepts among designers and users. It aims at revealing the common terminologies that are familiar to the users, their mental models, and important concepts for them.

User Control and Freedom

This principle aims to avoid mistaken actions by the users. The users need to be free and confident in using the interface, with a clearly marked emergency exit function, in order to avoid getting stuck and feeling frustrated in control of the system. The user's control and freedom can be accessed by clearly labelling and discovering the exit, undo, and redo functions.

Consistency and Standards

The fourth principle refers to the consistency and standards of the interface. It is obvious that it is not possible to force people to learn something new while they are spending most of their time using mobile applications other than ours. Those other smartphone applications set their expectations and shape their users' experiences (Nielsen, 2020). The consistency and standards are divided into different categories, including visual, page and button layout, user-entered data, and content. By following the rules of each category, we will be able to meet the user's demands based on the previous experiences that they already know (Krause, 2021).

Error Prevention

The interface should prevent user errors by avoiding unconscious mistakes and slips. This principle states that although it is crucial to communicate errors to users clearly and respectfully, it is better to avoid making mistakes in the first place. Some beneficial suggestions applicable to this research include helpful constraints, choosing good defaults, and forgiving formatting (Laubheimer, 2015).

Recognition Rather than Recall

Recognition rather than recall is a principle in user experience design that indicates that recognizing information is more convenient than remembering it for users. It depicts that the designer should reduce the amount of data that users have to remember as much as possible (Nielsen, 2020). For instance, using available commands in the menu bar of the smartphone application helps the users recognize what they want (Budiu, 2016). Another example is using the most common graphical features as icons for their functions to be recognized by the user.

Flexibility and Efficiency of Use

Flexibility and efficiency of use, or simply shortcuts, could speed up the navigation and interaction of a system. This principle suggests providing shortcuts and touch gestures that work as accelerators. It also proposes personalization and customization functions for individual users in order to give them more convenient selections (Nielsen, 2020).

Aesthetic and Minimalist Design

This rule ensures that irrelevant and unimportant information should not appear in the interface. It clarifies that the content and visual design of a mobile application should focus on the essentials. Furthermore, this principle suggests that the designer should avoid distracting the users with unnecessary elements to the extent that the users just face the information that they really need. It can be achieved by prioritizing the contents and features to support the goals (Nielsen, 2020). Limiting the amount of noise in the design, leveraging universal visual patterns that carry positive connotations, and reflecting beauty based on local context are the keys to achieving aesthetic and minimalist design (Fessenden, 2021).

Help Users Recognize, Diagnose, and Recover from Errors

The error message in a given interface should appear in a very simple language (no codes) to show the exact problem and suggest a solution. It should present a visual treatment to help the users notice and recognize the errors. For example, the traditional error message visuals (bold and red text) can be useful. It also states that the designer

should tell the users what the problem is in a very simple and understandable language (not technical) (Nielsen, 2020).

Help and Documentation

A system should be designed as simply as possible, to the extent that it does not need a manual. But every new interface needs documentation to help users understand and complete the tasks. The manual should be researchable to be sure that the users can find the information they want. Listing the various steps in the document is beneficial. There are two types of interface help: proactive help, which aims to familiarize users with an interface; and on-demand help, which provides assistance as needed. The content of the proactive help should be accessible elsewhere and should be kept as short and to the point as possible. The reactive help aims at answering questions and troubleshooting problems. This sort of document should be comprehensive and detailed. The designer can use graphics and videos in this document. In addition, highlighting top content that is frequently viewed is recommended (A. Joyce, 2020).

3.2.1.5 Mobile Application Heuristic

The mobile applications' usability heuristics were modified from the previous heuristic evaluation that focuses on computer software in general. Ger Joyce and his colleagues adapted the heuristic evaluation to mobile applications. They designed these with SMART (short for Smartphone Mobile Application heuRisTics) to differentiate the heuristics from other sets (G. Joyce, Lilley, Barker, & Jefferies, 2016).

SMART 1: Provide Immediate Notification of Application Status

The user of the mobile application must be informed of the status of the application immediately and for as long as necessary. In a non-intrusive way, for example by displaying notifications within the status bar.

SMART 2: Use a Theme and Consistent Terms, as well as Conventions and Standards Familiar to the User

This evaluation aims at ensuring that the various screens are uniform, and give the mobile application a theme. In addition, it helps to create a style guide in which words, phrases, and concepts that are recognizable to the user will be used consistently throughout the interface in a natural and logical manner.

SMART 3: Prevent Error Where Possible; Assist User Should an Error Occur

Prevent problems as much as possible; assist users if a problem arises. Ensure that the mobile application is as error-free as possible. If a problem occurs, inform the user in a way that they can understand and offer advice on how to resolve the issue or proceed in other ways. This includes issues with the mobile network connection, which may cause the application to work offline until the network connection is restored.

SMART 4: Display an Overlay Pointing Out the Main Features When Appropriate or Requested

When appropriate or requested, show an overlay highlighting the main features. An overlay highlighting the main features and how to interact with the application enables first-time users to quickly get up and running, after which they can explore the mobile application at their leisure. When requested, this overlay or help system should also be displayed.

SMART 5: Each Interface Should Focus on One Task

Each interface should concentrate on a single task. Focusing on one task means ensuring that mobile interfaces are less cluttered and simple, with only the elements required to complete that task visible onscreen. This also allows users who are frequently interrupted to glance at the interface.

SMART 6: Design a Visually Pleasing Interface

Create a visually attractive user interface. Attractive mobile interfaces are far more memorable and, as a result, are used more frequently. Users are also more forgiving of visually pleasing interfaces.

SMART 7: Intuitive Interfaces Facilitate User Navigation

User journeys are facilitated by intuitive interfaces. Mobile interfaces should be simple to understand, with obvious next steps. This enables users to complete their tasks more quickly.

SMART 8: Design a Clear Navigable Path to Task Completion

Make a clear path to task completion. Users should be able to see how to interact with the application and navigate their way through the task completion process right away.

SMART 9: Allow Configuration Options and Shortcuts

Allow shortcuts and configuration options. Depending on the target user, the mobile application may provide configuration options and shortcuts to the most important information and frequently performed tasks, as well as the ability to configure based on contextual needs.

SMART 10: Satisfy Different Mobile Environments

Provide for a wide range of mobile environments. Different environments have different contexts for use, such as poor lighting and high ambient noise, which mobile users frequently deal with on a daily basis. Users should be able to adjust the interface's brightness and sound settings using the operating system, but developers can make the user experience even better by providing features like larger buttons and multimodal input and output.

SMART 11: Facilitate Easier Input

Make it easier to input data. In terms of content input, mobile devices are difficult to use. Make it easier for users to input content by, for example, displaying keyboard buttons that are as large as possible, allowing multimodal input, and keeping form fields to a minimum.

SAMRT 12: Use the Camera, Microphone, and Sensors When Appropriate to Reduce User Workload

When possible, use the camera, microphone, and sensors to reduce the user's workload. Consider using the camera, microphone, and sensors to reduce the workload of the users. For example, by using GPS so the user knows where they are and how to get where they need to go, or by using OCR and the camera to digitally capture the information the user needs to input, or by allowing the user to input content through the microphone (G. Joyce et al., 2016).

SMART 13: Create an Aesthetic and Identifiable Icon

An icon for a mobile application should be visually appealing and easily identifiable because it is the first thing a user sees when searching the device interface for the application they want to launch and the first thing they see when browsing app stores before the application title, description, and screenshots (G. Joyce & Lilley, 2014).

3.3 Data Analysis

While it has chosen various methods for collecting data, interpretive analysis was applied to analyze the set of data, which was a combination of interviews, observations, prototype assessments, heuristic evaluation, and document materials. The flexible and accessible nature of thematic analysis was the reason behind choosing this methodology for analyzing the data. This approach furthermore provides a structured method for better understanding and interpreting a large and varied amount of data set, ranging from interviews, filed notes, a prototyped iCommunity interface, etc. Furthermore, thematic analysis is able to extract detailed and rich data from complex sources. It is not as complicated and frustrating as other methods, namely the grounded theory (Braun & Clarke, 2006).

3.3.1 Thematic Analysis

Thematic analysis is a technique for identifying, analyzing, and reporting patterns (themes) in data. It organizes and describes the collected data set in detail. Although this approach is widely used, there is no specific agreement about how it should be applied. However, there are recognized steps in doing thematic analysis in practice that is partially similar to other qualitative analyses, as follows:

3.3.1.1 Familiarizing with the Data

The first step in the thematic analysis is becoming familiar with the data. The data collected by the author throughout the research provide some prior knowledge of the data, which leads to nearly initial analytic interests and thoughts. This step is the bedrock for the rest of the analysis. During the data collection phase, particularly in interviews, focus groups, and observation, the researcher starts the first phase by taking

notes and marking ideas for initial coding that is aimed at the more formal coding process.

The verbal data were recorded by an audio recorder application via a Mi Lite 10 5G smartphone, all in Persian. Since translating the thirty-five interviews to English was time-consumingly impossible, only the concepts were transcribed in written form for conducting a thematic analysis. Some scholars argue that this phase should be considered a key phase of data analysis within an interpretative qualitative methodology because it involves creating meanings. According to the thematic analysis method, there is no need to emphasize the details in the conversation, discourse, or even narrative analysis, but it does require "a rigorous and thorough orthographic transcript/a verbatim account of all verbal utterances" (Braun & Clarke, 2006).

3.3.1.2 Generating Initial Codes

After familiarizing myself with the data and generating a list of initial ideas, the next phase was to generate the initial codes from the raw data. The codes were extracted from both semantic and latent contents and organized into meaningful groups that are different from the themes. In thematic analysis, there are two types of coding, depending on the research questions (theory-driven) or the collected data (data-driven). Because this research endeavours to find answers to specific questions, most of the coding was done manually within a theory-driven approach to particular features of the data sets.

Studying the entire data set as well as paying full and equal attention to the collected information and identifying interesting items led to finding repeated patterns that formed the theme. The coding process was done manually, and related themes were classified using Excel software. The author tried to extract from the code as many potential patterns as possible in order to provide a wide variety of themes that may be useful later. In addition, to avoid losing or ignoring the context, which is a common criticism of coding, the relevant surrounding data is also attached to the codes.

3.3.1.3 Searching for Themes

In this phase, a long list of different data sets has been coded and collated. The different codes have been sorted into potential themes and collated within the identified

themes. There are some hidden relationships among codes, themes, different levels of themes, and subthemes that have been considered in this research. In addition, some initial codes individually formed the main themes, while some of them shaped the subthemes, and some were completely discarded. The author has recognized a set of codes that did not belong to any themes; thereby, they were categorized as miscellaneous themes. Figure 1 shows an example of an initial thematic map for categorizing the codes into themes. According to this map, three main themes were identified: lack of awareness of participation, community engagement that enhances cultural heritage, and community participation that is useless (Figure 1).

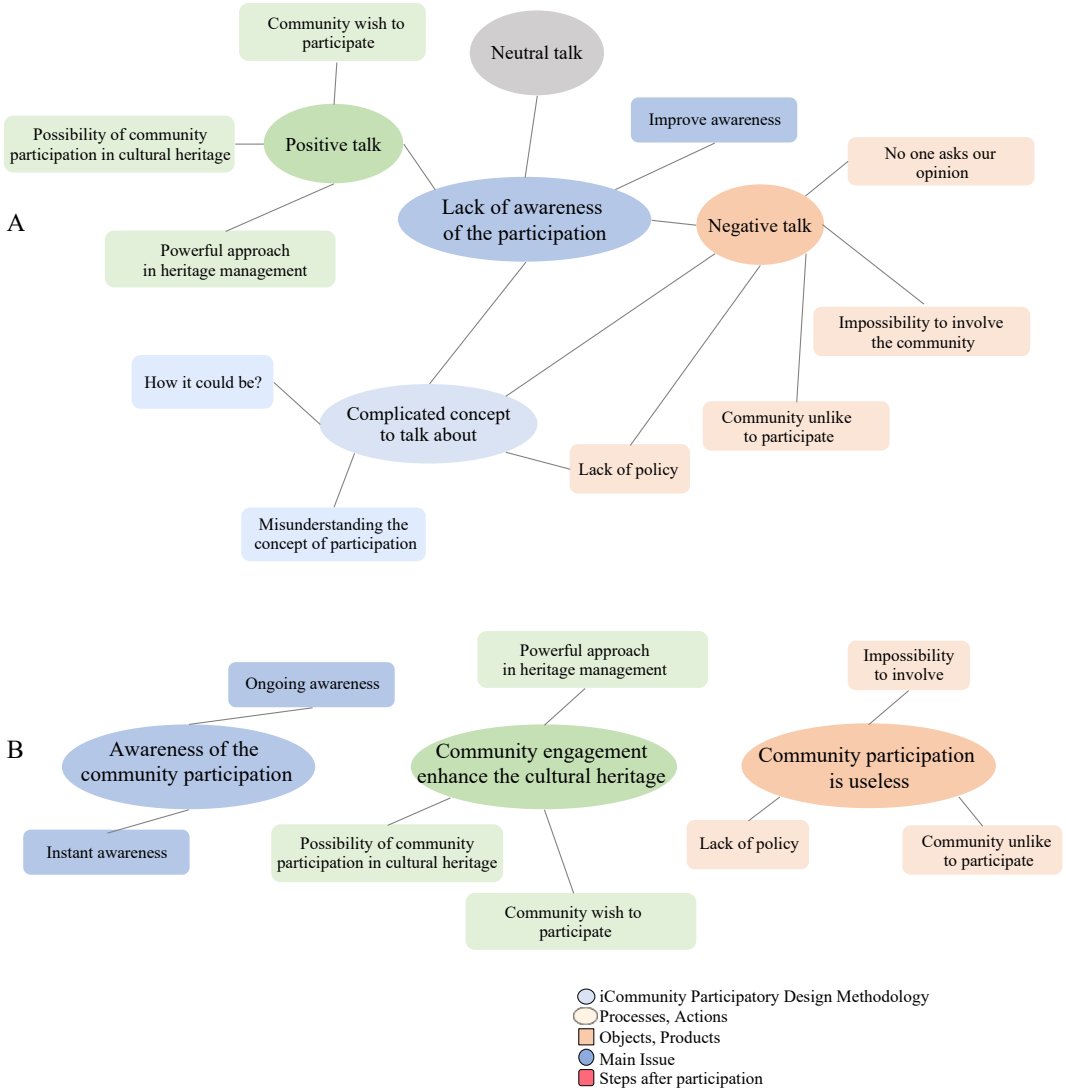


Figure 1 A. Initial thematic map, B. developed a thematic map, based on (Braun & Clarke, 2006)

3.3.1.4 Reviewing Themes

The fourth phase was reviewing the themes in order to get rid of redundant themes that did not have enough data to support them and highlight the evident themes. Some themes collapsed into each other because of their similarities (internal homogeneity), while some themes broke into separate themes because of their external heterogeneity. Two levels of review have been done in this research. In the first refinement, all extracted codes were considered to have a coherent pattern. The second level involved evaluating the validity of each theme in relation to the entire data set in order to find out if the theme reflected the meaning evident in the data set or not. In this phase, the collected data has been reread and recoded to ensure its validity and meaningfulness. Here, there was a problem of an endless recoding process that could lead to the research of unlimited data for analysis. Thereby, this rereading has been stopped when the recoding process did not add any new information, and the analysis achieved a satisfactory thematic map of the data.

3.3.1.5 Defining and Naming Themes

At this point, the researcher has defined and refined the themes that will be presented in the data analysis. These 'define' and 'refine' mean identification of "the essence of what the theme is about and determining what aspect of the data each theme captures" (Braun & Clarke, 2006). The author tried to avoid too much diversity and complexity in each theme in order to make them as simple as possible. Thereby, the collated data for each theme has been organized into a coherent and consistent account. In this phase, not only have the extracted data been paraphrased, but also the interest in them has been identified for conducting and writing a detailed analysis for each individual theme in relation to the research questions. In addition, the sub-themes have been identified, if they contained any. For more clarity, a concise name has been given to each theme.

3.3.1.6 Producing the Report

The final phase of the data analysis is reporting the stories behind the themes. In this research, each theme has been logically reported in two main sections. The first one described the issues of community-based participation in cultural heritage

management, and the second demonstrated the needs and wishes of the users about the prototyped mobile application that will be presented in the next chapters.

3.4 Summary

Chapter three of the research discusses the methodology employed for the study. It begins with an introduction that explains the purpose and research questions of the study. The research design is explained, highlighting the different data collection methods and data analysis techniques used in this research. Formative evaluation meant getting feedback from users while the mobile application was being designed and prototyped. This lets the researcher find and fix any problems with the app before it is released to the public.

User observation and monitoring involved observing and tracking user behavior while using the application. This allowed the researchers to identify any issues users encountered while using the application. The heuristic evaluation involved assessing the application against a set of predetermined heuristics or usability criteria. The author used ten heuristics to evaluate the iCommunity app. These included being able to see the status of the system, how well it matches the real world, user control and freedom, consistency and standards, error prevention (recognizing rather than remembering), flexibility and ease of use, an attractive and simple design, helping users recognize, diagnose, and fix errors, and help and documentation. The author also came up with the SMART heuristics, which are thirteen specific rules for judging mobile apps. These SMART heuristics focused on different parts of designing mobile apps, such as notifying the user right away of the app's status, using the same terms and conventions, preventing errors, making it easy to find the way to finish a task, and giving configuration options and shortcuts.

The section on data analysis explains the interpretive analysis technique used for the study. This involved familiarizing with the data collected, identifying patterns and themes, creating analytical categories, analyzing the data, doing interpretation and synthesis, refining the analysis, and writing up the analysis. The researchers used thematic analysis to identify common issues and themes encountered by users. This allowed the researcher to address the issues and improve the mobile application's

usability. In the next chapter, the evaluations and results of the research based on this methodology will be described.

4 Chapter Four: Development Framework

4.1 Research Design

The research was conducted within a local community that is affected by a protected area (the landscape zone of the Bisotun World Heritage Site) as a way to find out how those affected people can be included in the decision-making process. Despite the fact that two case studies could provide a comparative study for a better understanding of community-based participation in cultural heritage management, working in a single community allows the researcher and community members to develop a reciprocal relationship over time rather than moving from one community to another.

The Bisotun World Heritage Research Base, which was set up in 2000 as a national research center, is in charge of preserving and managing the Bisotun landscape zone. The research base, which served as the government organization in this study, has long wished to involve the local community in the conservation and management of the Bisotun landscape zone. Seven participants have been chosen from the Research Base employees who are also living in the landscape zone. The other 28 people were chosen from the local community because they were affected directly or indirectly by the landscape zone policy.

Drawing from international documents concerning the community-based participation approach, the government organization, and input from local participants, the requirements and essential features of the iCommunity application were elucidated. Subsequently, utilizing Adobe XD software, a digital prototype of the application was crafted. This prototype underwent iterative refinements to establish a standardized mock-up. It's worth considering that the study tries to construct a comprehensive framework and that the application served as a demonstrative tool within this framework.

Since this research used different sources of data, the author had to use different methods and techniques to collect and analyze the data. The data collection itself required using human-computer interaction methods, including formative evaluation, collection of users' opinions, user observation, and monitoring, and predictive

evaluation, respectively. Different ways of analyzing data have been tried out to find the best one. In the end, the best method was found to be thematic analysis, which will be explained in the next few pages.

4.2 Procedure

The definition of public participation is clear in academic atmosphere and theory, but in practice, it has an extensive meaning. Some people believe that participation is listening to marginalized groups, and others think that it is a way to protect their privileges. Some politicians use public participation as a method for more democracy and transparency, some utilize it to generate public support in the elections (Devisch, Huybrechts, & De Ridder, 2019). According to Arnstein (1930-1997), public participation is "the redistribution of power that enables the have-not citizens, presently excluded from the political and economic processes, to be deliberately included in the future" (ICOMOS, 1975).

Therefore, the terms of participation spread in nearly all different branches of science, and the phrase 'Public Participation in something' was arrived. The best example of the development of participation term is cooperative design. The cooperative design which is known as participatory design emerged in Scandinavia in the 1970s as a reaction to how computer systems were being introduced into the industry to hurt workers. The participatory design includes a set of processes, techniques, and theories that have been originally designed for improving the worker's situation. It has also been used to include more voices in the design process and to involve those who will be affected by the design in the decision-making process (Bødker et al., 2000).

In spite of the fact that the concept of modern design focuses on the outputs, participatory design concentrates on "the shared concerns with the labor movement and its values" (Bannon & Ehn, 2012). As a result, one of the key factors in participatory design focused on the "process that enables different participants to engage in designing the product" (Robertson & Simonsen, 2012). This process is as important as the final system, service, or artifact that is produced in a participatory design. This approach has been applied in different contexts including engaging visitor experiences in the museum (Iversen & Dindler, 2008), creating services for the homelessness (Le Dantec &

Edwards, 2008), new technology in the urban environment (DiSalvo, Nourbakhsh, Holstius, Akin, & Louw, 2008), involving elder people in technology and a platforms (Light, Simpson, Weaver, & Healey, 2009). In fact, participatory design is attempting to involve marginalized people in the design process.

These multidisciplinary functions of the participatory design led to the emergence of the third wave of participation; community-based participatory design (CBPD). In the Routledge International Handbook of Participatory Design (2013), Carl F. Disalvo illustrated this new arena of participatory design by highlighting the importance of social constructs and relations of groups in a participatory design context. He also explained the role of community-based organizations (CBOs) in CBPD by dividing the relationship of communities to the environment into three categories; communities of place, communities of identity, communities of interests, and communities of practices (Heitlinger, 2017).

Communities of place is referring to a group of people that are defined by a physical spatial boundary such as local people living in the landscape zone, core zone, and buffer zone of Bisotun World Heritage Site. Communities of identity are characterized by kinship, ideology, gender, ethnicity, etc. Common interests can unify people in order to form a community that is working based on their concerns such as cultural heritage NGOs (Non-Governmental Organizations). The last category is communities of practice that are bound by their practice on a specific topic like cultural heritage institutions, cultural heritage experts, and the Bisotun World Heritage Research Base. This division of communities aims at recognizing the stakeholders in a participatory approach.

The iCommunity mobile application is a type of educational mobile application that is focused on learning, teaching, and sharing knowledge in an interactive way. It aims at different target audiences with various social levels. As was mentioned previously, the main objective of this research is to design a method and a mobile application in order to facilitate the interactions between local people and the BWHS by including local people in the decision-making processes. Hence, in light of the fact that community-based participatory design is an effective method, particularly as a means of including local people that are normally excluded in the design and decision-making process.

In mobile application prototyping, there are a number of programs that allow us to work on user interface prototyping. An interactive, software-based smartphone application has been prototyped by Adobe XD software in order to depict the ideas of how to use the mobile application in community participation in cultural heritage conservation. Adobe XD is an easy-to-use vector-based design platform that allows us to design, organize, animate, and share our thoughts in a digital format (Rae, 2020).

The pre-design session seeks to find the users' interests and wishes regarding the primary draft of the iCommunity application by asking open-ended questions about their expectations. The collected thoughts and notions have been combined with the functional requirements found in the related documents and observations. Based on these factors, the first version of the prototype has been created using Adobe XD software, a vector design tool for web and mobile applications (version: 45.1.62.3 x64, Creative Cloud Sync 5.4.0.15). The first version of the prototyped iCommunity has been initially modified under the supervision of professor Cristina Gena (Department of Computer Science at the University of Turin) in order to standardize the application user interface. The iCommunity application will be meticulously described in this chapter.

4.2.1 iCommunity Model

The iCommunity model is a method for the community engagement process in the Bisotun World Heritage Site by using a web-app application as a tool. For designing this model, several aspects have been considered in order to meet the public participation needs and requirements. These 'needs and requirements' should cover the spectrum of public participation which were considered as the model principles.

After recognizing the general needs and requirements, the iCommunity model has been prototyped as a mobile application in order to find its straights and weaknesses, as. Well as for a better understanding of the users (local community, NGOs, and Management Department) ideas about the model. After several modifications were made to accommodate the user's needs, the application was evaluated using both a heuristic evaluation and a mobile application heuristic evaluation.

For the informing function, the iCommunity application is able to publish new and future activities in an appropriate way to let the people know about what is happening

in the Bisotun World Heritage Site. Along with ‘what is happening,’ the complementary information such as the location, the ideas behind the activities, budget assessment, relative research, etc. are attached to the posted activity.

Based on the published activities, the application must provide relative workshops and training courses for improving local people’s knowledge. Before the pandemic, every year, the Bisotun World Heritage Research Base held a number of specialized and general workshops for different age groups as one of their organizational duties. But during quarantine, they were unable to continue on that way. The smartphone application should be able to organize these workshops and events in the form of ‘in-site’ or ‘online.’ In-site events will post on the main page to inform people about participation due time and online workshops are published on the application. In the latest one, the users have access to downloadable documents. Most often, other cultural heritage institutions hold workshops and events which are also useful for the Bisotun World Heritage Site. Through the application, iCommunity’s admin shares the link to allow the users to participate.

For the consulting purpose, these functions were considered: comment, message, talk to experts, and ask for permissions. Each posted activity has a space for the user’s comment. In this section, the users are able to post for and against ideas on the projects and activities. Like Instagram, other users can read and participate in the topics raised in the comments. For more connection, the users also can receive and send direct text to each other via the message function.

Furthermore, every user can consult with an expert in case of needing more information and discussion. Basically, in the Bisotun World Heritage Research Base, there are different departments that are working on different topics and every activity and project has a specific expert who is in charge of the given project. The users must have direct access to the project manager. Since these project managers properly know all the activity information, they are the best ones for asking and arguing.

Users are able to upload their documents in the form of images, video, voice, and pdf files in the add user’s experience section. Local people often have valuable information about the cultural heritage site that is beneficial for the conservation and management of the given heritage site. On the iCommunity, users can share old

pictures, stories, legends, and written documents with experts for using them in projects and activities. This function aims at involving the community in the process.

Every year for some special events, the Bisotun World Heritage Site needs temporary recruitment without payment for different positions. For example, during the Nowruz holidays, when the number of visitors is increasing, the Site needs more tourist guides. Thus, the positions publish in the voluntary activity section in order to ask enthusiasts and local people to involve. These voluntary positions are not limited to Nowruz and tourist guides, the World Heritage Site always requires various specialists including archaeologists, researchers, students, carpenters, etc.

Those functions aim at collaborating and empowering purpose. Listening to users' voices, gathering different ideas, arguing, voting, and publishing the outcomes in the data analysis function led us to engage the local community in the decision-making processes. The iCommunity application at least will provide an appropriate condition for achieving the community-empowering purpose (Figure 2).

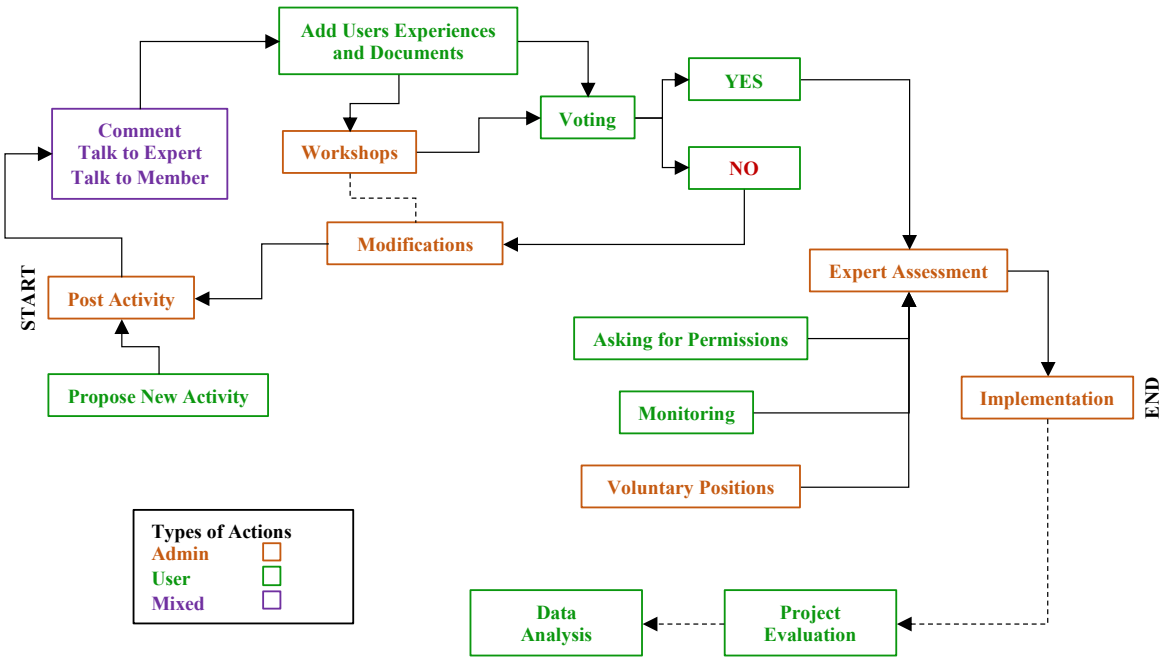


Figure 2 iCommunity model and lifecycle

4.2.2 Development Process (iCommunity Participatory Design)

The history of Participatory Design (PD) dated back to the 1970s when designers had an ambition of creating better products and more user-friendly systems. It aims at

engaging the users in the design process (Devisch et al., 2019). The idea is that when affected people have a right to participate in the decision-making process, why they cannot participate in the design process? In this way, all stakeholders are able to share their idea relating to the specific project.

Based on this point of view, we have tried to design a mobile phone application in order to include the local community in the decision-making process at the landscape zone of the Bisotun World Heritage Site, Iran. Thereby, the previous and current model of using digital platforms to facilitate local people's participation in the Bisotun site has been considered for discovering and understanding the deficiencies and strengths they may have in observing users in the context phase. The second phase was scenario-based design, which is a set of techniques in which the use of a future system is described in detail early in the development process. Then, based on the technical and functional needs and requirements, the iCommunity mobile application has been pre-designed from an outsider's point of view. The pre-designed application examined the insiders' needs and requirements for maximum matching to their real needs through the design and presentation of the ideal situation phase. In the design of the prototype and initial test section, the iCommunity application has been prototyped and modified in terms of interface and functions. The next step was the presentation of the prototype to the users and experimentation with the users to discover and modify probable problems with using the iCommunity application. Afterward, heuristic and SMART evaluations have been done by a group of master's students at the University of Turin's department of computer sciences to find its technical and functional issues.

The main actors in the iCommunity participatory design are the local community, the Bisotun World Heritage Site Research Base, and a researcher who designed and modified the application and acted as a facilitator between local people and the cultural heritage institution. Figure 3 indicates the process of iCommunity participation design for determining different phases such as design, modification, and evaluation of the application.

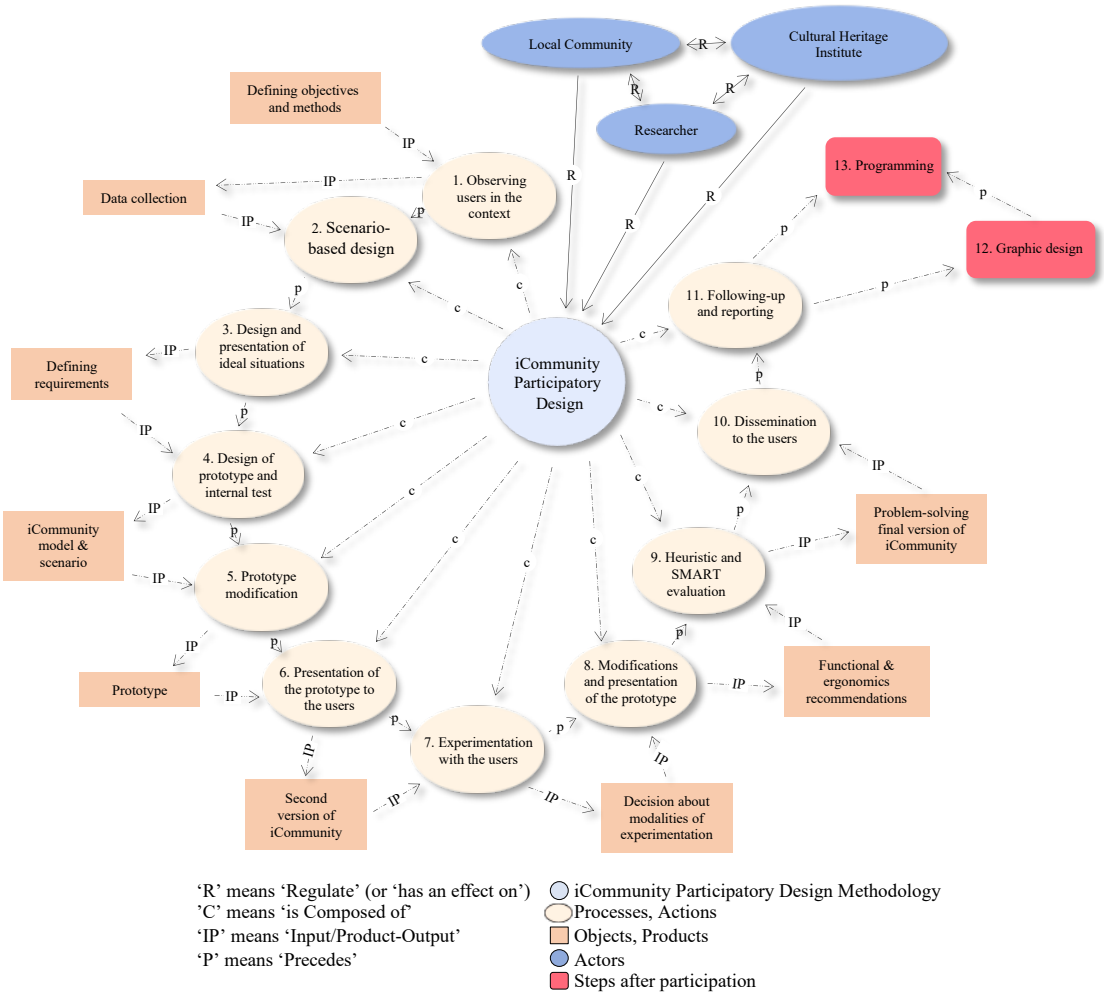


Figure 3 Adapted palette process of iCommunity participatory design, based on (Daele et al., 2009)

4.2.2.1 Observing Users in the Context (Bisotun World Heritage Site)

It was an opportunity to observe the current situation of public participation in the Bisotun World Heritage Site for eight months between March to August 2021 and July to August 2022 as a secondment. During these periods, I was working there in order to collect the data that I needed for different phases of the research. Based on the categorized methodologies, the main data collection has been done in August 2021, and the second part was completed in August 2022.

The Bisotun World Heritage Site takes advantage of digital platforms through a website and an Instagram page. The general information about Bisotun World Heritage Site is available at http://www.bisotun.ir which is a local domain. The website was launched in 2014 to provide an overview of previous, current, and future activities and projects in the world heritage site. It seems that the website is run and designed in a

way that doesn't update regularly. It more or less looks like a digital catalog consisting of multiple layers of classified information about the site. With the emergence of other digital platforms, which are more interactive and user-friendly accessibility, users move from websites to new digital platforms. As a result, the Bisotun World Site shifted its activities to mobile platforms. They are also using Instagram available at @bisotun.bis as a way of keeping informing audiences and establishing sustainable interaction with them.

Whilst the Covid-19 quarantine time collapsed every single one of the face-to-face communications and shut down the museums and cultural heritage institutions' activities, it provided an appropriate moment for enhancing an alternative way of connection; virtual interaction. The Bisotun World Heritage Site was completely blocked off for around six months. After the subsidence of the pandemic, it worked based on the covid situation. In early 2020 and as a consequence of covid-19 quarantine, the site's administration decided to move from in situ activities to the virtual world in order to find a way to keep their relationship with local people, visitors, and audiences. It was an opportunity to enhance the world heritage site activities on social media.

The Instagram page has been refreshed and it was planned to post two times per week. Every Friday, they launched 3 to 5 multiple questions about cultural and world heritage issues as a Story that the users answered. Most often, these questions were extracted from Tuesdays' posts. On Tuesdays, a post regarding raising awareness has been published. The content of these promotions was ancient art and culture, history of conservation, archaeological activities, introducing national and world heritage properties located in the landscape zone, forming the Bisotun relief and inscription, etc. The technique for the content production was a combination of text, image, video, animation, and music.

The content production focused on awareness promotion. One group of cultural heritage practitioners with different specialties includes a curator, an architect, a social media expert, an animator, and a conservator-restorer. They regularly had a meeting concerning the contents that they would like to work on. Each member of the group has been working on specific parts of the content, a range from designing questions to making animations. At that time, a little bit more than 1000 users were following the @bisotun.bis Instagram page. The results were amazing. The number of likes fluctuates

between 30 to 60 percent of total followers which is much higher than the average. According to statistics, the average engagement rate on Instagram is around 3.21% and a good engagement rate is between 1% and 5% (Schaffer, 2022).

4.2.2.2 Scenario-Based Design

The iCommunity application's scenario was a simple narrative description of the episodes in order to demonstrate the application's various features. The main features include future activities, chat rooms, voting, registration, workshops, and settings that were planned in the initial phase. During the participatory design process, other features were added to the scenario. Figure 4 shows the initial scenario and additional features discovered during the research.

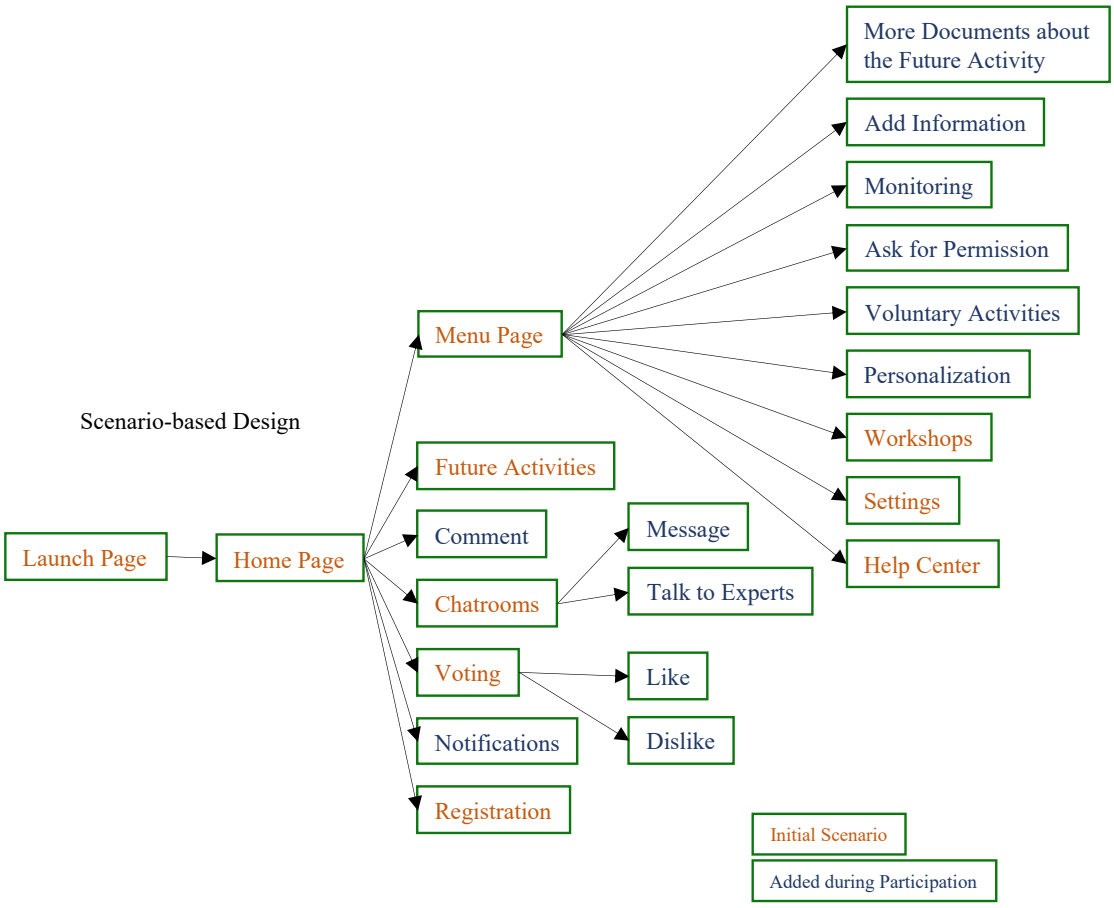


Figure 4 iCommunity's scenario design, initial and final scenario

4.2.2.3 Design and Presentation of Ideal Situations

Outsiders' Points of View

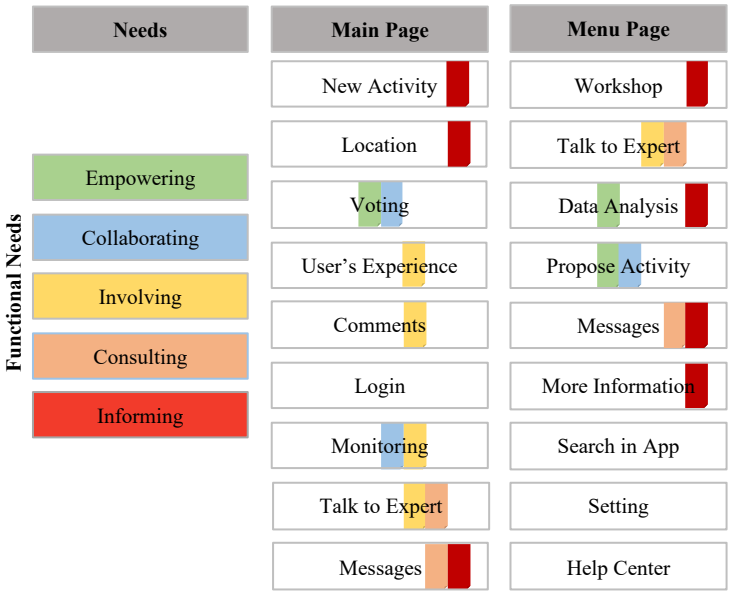
In order to design an effective application in dealing with public participation in cultural heritage management, the requirement has been divided into two main categories. There are various specifications, needs, and wishes from outsiders' and insiders' points of view which are occasionally similar or different. First, the author searched a lot of documents regarding requirements for community participation to understand what we do expect from iCommunity as an outsider regardless of the insiders' needs. Then, the insiders' interests and wishes have been accompanied to shape the application. In this way, not only iCommunity will be designed based on the users' demands but also it covers the public participation requirements.

Since the main goal of this application is the maximum inclusion of local people in decision-making processes for cultural heritage management, it is essential to find out the functional and technical needs. The idea is to encourage different stakeholders, such as local people living in or around the Bisotun World Heritage Sites, to take active roles in decision-making processes related to management and conservation. Furthermore, this mobile application supposes to provide sufficient information and clear data for the direct and indirect education of users by holding different workshops. Data shown in the application will also help people to understand the reasons behind the implementation of planned activities by taking part in comments and talking with experts or professionals. In addition, it also aims to make the decision-making process clearer and more transparent by presenting voting functions and showing all comments to users. Finally, the application outcomes (which include analyzed data collected by feedback, voting, communication, etc.) will help to understand the real needs and interests of different stakeholders in cultural heritage sites and museums.

Functional Needs

For designing the iCommunity application, several aspects have been considered in order to meet the public's participation needs. These 'needs' should cover the spectrum of public participation which are informing, consulting, involving, collaborating, and finally empowering. To meet these demands, various functions have primarily been considered for the iCommunity (Table 6).

Table 6 Adapting the requirements of the people participation approaches and the features of the mobile application



On the home page of iCommunity, there is a section for listening to the local people's voices. When a new activity or project posts on the application, users can comment on it. In addition to informing, this function leads to involving the users in the published activity. For the *informing* function, iCommunity must be able to publish new and future activities in an appropriate way to let the people know about what is happening in the Bisotun World Heritage Site. Along with 'what is happening,' the complementary information such as the location, the ideas behind the activities, budget assessment, relative research, etc. must be published on the main page of the application. In addition, iCommunity must provide relative workshops and training courses for improving local people's knowledge about cultural heritage management and conservation.

Since the landscape zone of the Bisotun World Heritage Site is quietly vast, the geographical location of the future activity is significant. Therefore, one of the most important pieces of information that must be publicly published is the exact geographical coordinates of the projects. The iCommunity application needs to have access to the smartphone location.

Before the pandemic, every year, the Bisotun World Heritage Research Base held a number of specialized and general workshops for different age groups as one of their

organizational duties. But during quarantine, they were unable to continue that way. The proposed smartphone application should be able to organize these workshops and events in the form of 'in-site' or 'online.' In-site events will post on the main page to inform people of participation in due time and online workshops are published on the application. In the latest one, the users have access to downloadable documents. Most often, other cultural heritage institutions hold workshops and events which are also useful for the Bisotun World Heritage Site. Through the application, iCommunity's admin shares the link to allow the users to participate.

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Technical Needs

Based on the needs of the Bisotun World Heritage Site, the technical specifications of the iCommunity were specified. There are three types of smartphone interfaces; Web apps, native, and hybrid with different specifications. The outsiders would like to develop an interface that must be cheap, fast, easy to update, has access to search engines, some device features, and the internet. Simultaneously, since it regularly needs to be adaptable to the users' feedback, the maintenance must be as simple as possible. The interface also has to be runnable on different operating systems. Thus, it seems that the Web-based application (IBM, 2021) is an initial choice in this case. According to IBM research on defining the mobile application requirements, the specifications of the Web-Apps are:

- Quickly discoverable via a search engine
- Fast in the development process
- Simplicity in maintenance and update
- Development costs are cheaper than hybrid and native
- No need to distribute software to machines that run the application
- Updates are immediately available to the user
- Much slower than native and hybrid
- Cannot do work offline
- Not optimized for the platform on which they run
- Cannot use devices' features such as the camera, contacts list, or accelerometer
- Different user experience

But the problem is that the iCommunity application needs to use the devices' features. The native application allows full access to all devices' features such as GPS, camera, contact list, gestures, and notifications which are vital for the tool used in the public participation process. It also works without an internet connection and provides a full experience to the users. Native application functions effectively, efficiently, and satisfactorily in terms of usability. But application development necessitates a high level of specialized programming knowledge which leads to a considerable increase in cost. The complicity in maintenance for both developers and users additionally make it harder to use (De Andrade, Albuquerque, Frota, Silveira, & da Silva, 2015; IBM, 2021).

The hybrid applications or cross-platforms provide a range of different specifications. It works on different platforms, so the development and maintenance costs are more affordable. In spite of the fact that they are not as expensive as natives but they are more costly than Web apps. The maintenance is relatively simple and it can be modified and repaired as often as necessary. The user interface approximately looks like a native application (Zohud & Zein, 2021). For a better comparison, the pros and cons of these various mobile applications display in Table 2 by considering the advantages and disadvantages of each type and the necessary requirements for iCommunity, it appears that the best alternative is cross-platforms (Table 7).

Table 7 Advantages and disadvantages of different types of mobile applications (Chebbi, 2019)

	Type	Advantages	Disadvantages
Mobile Applications	Progressive Web Application	Accessible via search engines Fast development Simple maintenance Easily update Not use devise storage Low cast	Different user experience Not work offline No access to devise features Not optimized Slower than hybrid and native
	Cross-Platform Hybrid Application	Less expensive Simple maintenance Lower development costs than native The user interface is close to native Works on multiple platforms	Slower than native Not full access to devise features Not fully optimized
	Native Mobile Application	Great user experience Direct access to the device features Works offline Fully optimized More efficient	Multiple codebases Expensive development Expensive maintenance Require a high level of knowledge

Users' Privacy

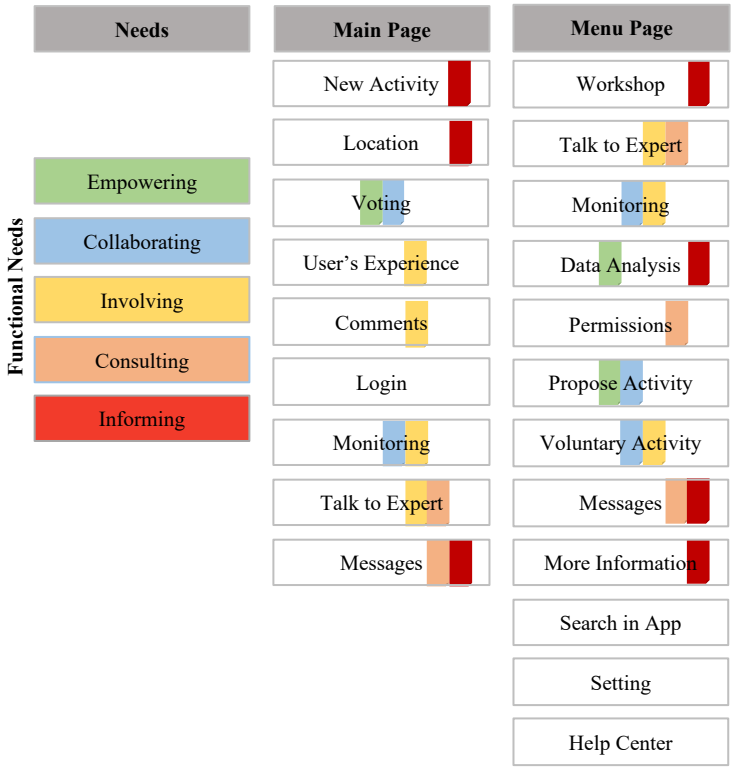
Users' privacy was another issue that dealt with the users having control over how much of their data is shared and with whom. It was a long discussion about the user's privacy, protection, and identities in the iCommunity. Whilst some participants agreed with the fact that users should be anonymous, others debated that the identity of the users must be authenticated before logging in in order to avoid fake users. These arguments unveiled a new debate; user profiles and user identities. According to the survey, based on the idea of increasing openness and transparency are considered vital elements for public participation in order for public awareness of decision-makers and

for people's insight and influence (Andersson, 2001), the iCommunity users must register in the app by their mobile number, then they can make an anonymous profile.

Insiders' Points of View

After designing a simple application, based on previous documents on what public participation needs and requirements, it is necessary to add the insiders' needs and wishes to the designed application. This phase has been done through personal and focused group interviews (Table 8).

Table 8 Adapting the requirements of the people participation approaches and the features of the mobile application



Every year for some special events, the Bisotun World Heritage Site needs temporary recruitment without payment for a different position. For example, during the Nowruz holidays, when the number of visitors is increasing, the Site needs more tourist guides. Thus, the positions publish in the voluntary activity section in order to ask enthusiasts and local people to involve. These voluntary positions are not limited to Nowruz and tourist guides, the World Heritage Site always requires various specialists including archaeologists, researchers, students, carpenters, etc.

4.2.2.4 Design of Prototype and Initial Test

The iCommunity prototype's first version was actually quite frustrating. It was created prior to the COVID-19 situation when the research was supposed to take place at the Yazd Historical City World Heritage Site. The first version was called Community PS, but it has since been renamed iCommunity. It outlined the key aspects of the application's requirements. Following the launch page, there was a summary of what users would see on the application. Because the registration feature appeared just before the home page, users had to sign in or log in before they could access the home page. The home page consists of a menu that includes introduction, workshops, new projects, voting, chat rooms, gallery, settings, and who we are features. The introduction indicates a general overview of the activities that the given cultural heritage institution is working on. The workshops feature focuses on the workshops and training courses provided by the cultural heritage institution. The new project function introduces the future activities that the world heritage site would like to engage the users in during the process. The voting feature collects the users' opinions about future activities. On the chat rooms page, users are able to communicate with other users or experts. Figure 5 and Figure 6 show the initial prototype of the Community PS application.

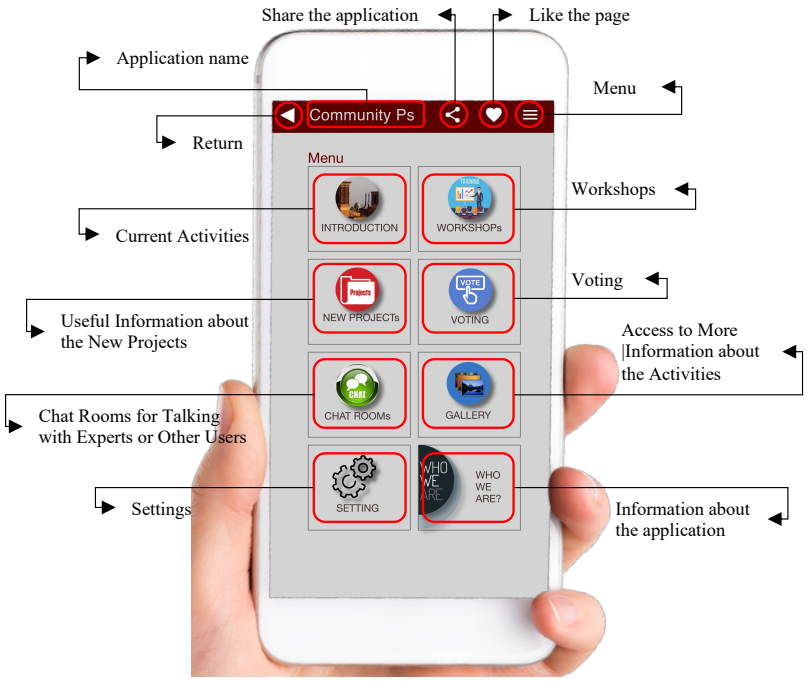


Figure 5 Initial prototype application called Community PS, main page

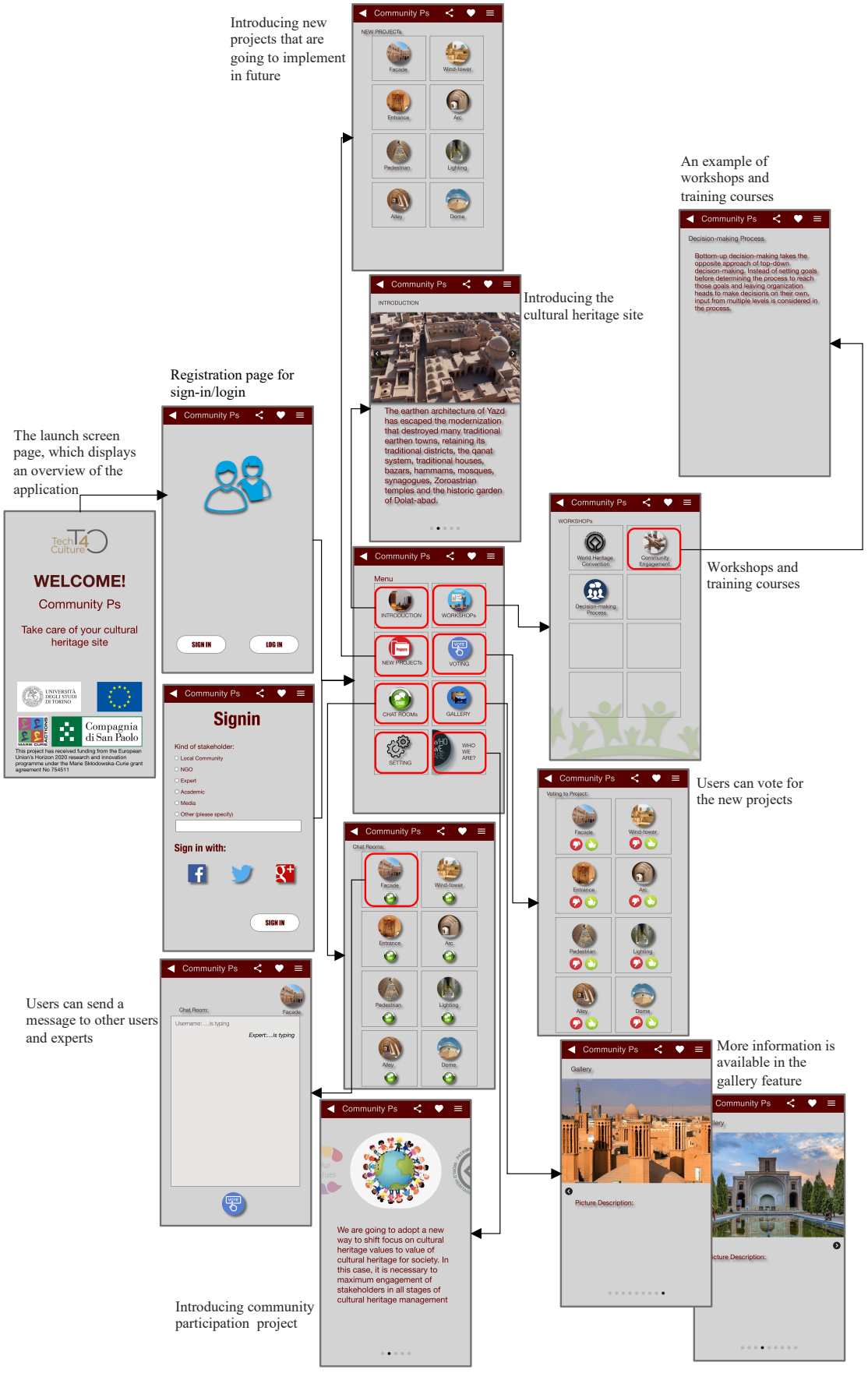


Figure 6 Initial prototype application called Community PS, features and functions

4.2.2.5 Prototype Modification

An interactive, vector-based experience design platform has been prototyped by the Adobe XD[5] software in order to depict the ideas of how to use the mobile application for community participation in cultural heritage conservation, as was mentioned in the preceding chapter. The application is based on the smartphone's touchscreen. The vector-based design platform Adobe XD is user-friendly and allows us to easily create, organize, animate, and share digital versions of our ideas.

During the pre-design session, open-ended questions are asked about what the users want in order to find out what the users are interested in and what they want from the first draft of the iCommunity app. The collected ideas and concepts have been put together with the practical needs found in the related documents and observations. Adobe XD, which is a vector design tool for making web and mobile apps (version: 45.1.62.3 x64, Creative Cloud Sync 5.4.0.15), was used to make the first version of the prototype, which was based on functional and technical requirements. In order to standardize the application user interface, the first version of the prototyped iCommunity was initially modified under the supervision of professor Cristina Gena from the Department of Computer Science at the University of Turin. Between February 2020 and September 2022, the application was constantly modified to be as close to the needs of the users as possible.

4.2.2.6 Presentation of the Prototype to the Users

The prototype application was presented to Bisotun World Heritage Site personnel in order to gather their final ideas and opinions on the interface and functions. They suggested that some features should be added to the application. A *monitoring* feature for the conservation of cultural heritage monuments and sites in the Bisotun World Heritage Site's landscape zone should be added to the iCommunity. Because the landscape zone is a protected area covering approximately 35,000 hectares, the application should involve local residents in monitoring and reporting any daily issues

[5] https://www.adobe.com/products/xd/learn/get-started/what-is-adobe-xd-used-for.html

that they may face. The monitoring feature is divided into the following categories provided by the Bisotun World Heritage Site; *Unauthorized Construction, Demolition, Illegal Excavation, Violation of Buffer Zone, Mining, Land Use Change, Inappropriate Materials, Negligence in Property Maintaining, Unauthorized Restoration, Land Cleaning, Exploitation, Building Development, Changing the Property, Inappropriate Attachment, Trafficking,* and *Other Issues*.

During previous activities, they discovered that some locals had valuable information about the activity, such as old pictures, movies, similar projects in other cultural heritage institutions, and so on. As a result, the *add information* feature was integrated into the home page, allowing users to upload additional information via the iCommunity and send it to the experts for review and attachment to the project.

For any kind of land use change or development project, there is a specific procedure for acquiring relative permissions from local governmental administrations. This procedure starts at the Bisotun World Heritage Site, which is in charge of the restoration and protection of the Bisotun landscape zone. People must apply for permission for the following; *Building Construction, Demolition, Excavation, Core Zone and Buffer Zone Location, Mining, Land Use Change, Building Restoration, Building Development, Farming and Watering, Land Cleaning, Infrastructure, Road, Changing the Property, Archaeological Sites,* and *Other Permissions*.

Another feature that users would like to see on the application is *voluntary positions*. During a specific time period, the Bisotun World Heritage Site recruits volunteers for a variety of positions. Especially during the Nowruz holidays and in the summer, when there are a large number of visitors. The site advertises open positions for which users can apply throughout the iCommunity application, and users can submit their requests via the application. The prototype application now includes all of these features.

4.2.2.7 Experimentation with the Users

Following the addition of the previous features suggested by users, a link and a QR code were sent to some users for final application evaluation. The author had the opportunity to review the iCommunity by users at the Bisotun World Heritage Site during the last secondment period, which ran from early July to late August 2022. There

were a few minor issues that were quickly corrected during the user reviews. Users can access the iCommunity prototype application by scanning the QR code with their smartphone (Figure 7).

Figure 7 iCommunity prototype application, QR code for online access

4.2.2.8 Modifications and Presentation of Prototype

In addition to online access to the application, a simple catalog with explanations of various functions and features was printed as a user guide. The catalog describes the home and menu page icons and features in Persian before translating them into English (Figure 8 and Figure 9).

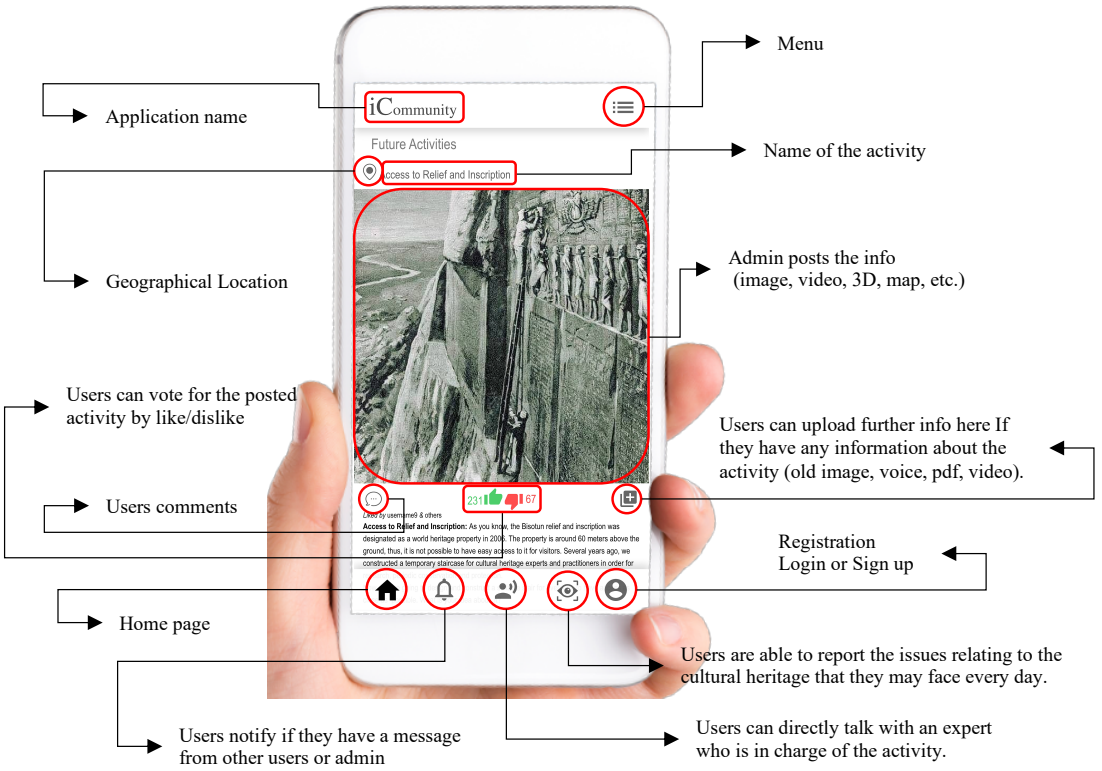


Figure 8 iCommunity home page, functions, and features

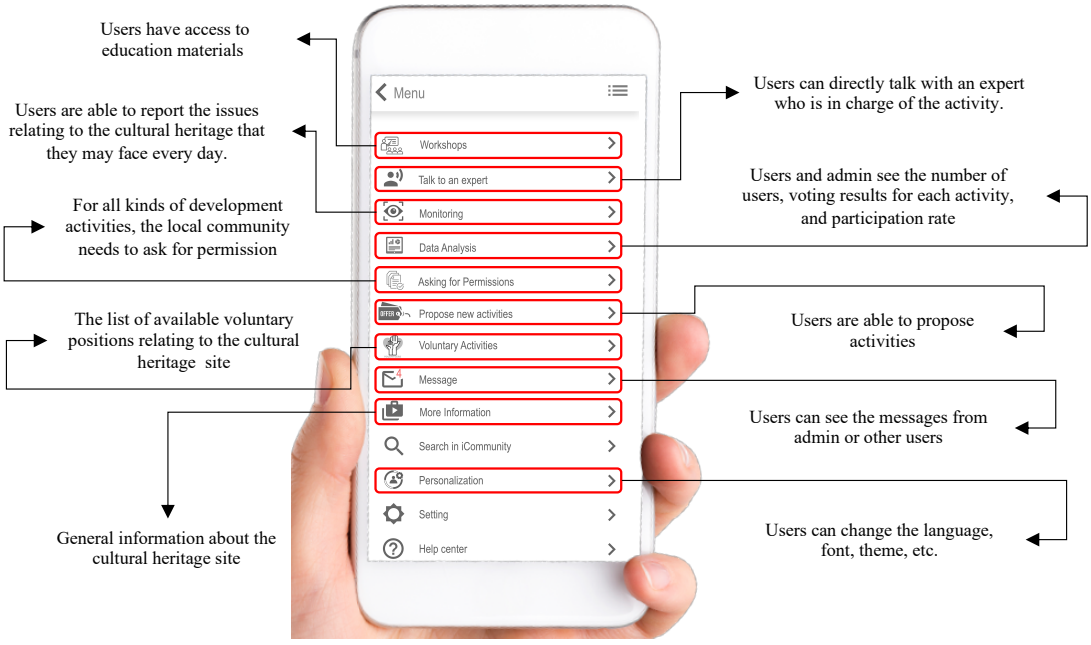


Figure 9 iCommunity Menu, functions, and features

4.2.3 Thematic Analysis

4.2.3.1 Initial Codes

To make the initial codes, the researcher reads through the data several times, line by line, looking for meaningful chunks of data that relate to the research question or topic of interest. These segments of data are then assigned a descriptive code that captures the essence of what is being said. For example, if the research question is about public participation in decision-making, the initial codes extracted from interviews may include public participation, knowledge, attitudes, mechanisms, and national trend (Table 9). It is important to note that initial codes are not final codes and may change as the analysis progresses. Thematic analysis is an iterative process. As new data is collected or the analysis moves forward, the researcher may change, combine, or get rid of some of the initial codes.

Table 9 Initial codes, frequency, and examples extracted from the interviews

Codes	Freq.	Example
Meaning of local people participation	12	"What do you mean by local people participation? Do you mean we must get local people's opinions about all activities that we want to apply at the Site?" (P12)
public participation in decision-making	13	"People's participation in decision-making in cultural heritage management, really?...They are not experts in cultural heritage sciences." (P8)
Education, knowledge, attitudes, consensus	5	"It is too difficult to reach a consensus with local people with diverse backgrounds and various attitudes about cultural heritage issues. It might happen after a long period of time if we improve their knowledge of cultural heritage values." (P5)
Mechanisms, national trend, long way	9	"The Ministry of Cultural Heritage occasionally sends us official circulars... I think there is a national trend toward engaging people in cultural heritage issues, but there are no systems or mechanisms for how to apply them. We are in the early stages of involving people, and we have a long way to go." (P7)
Just informing, not involving in decision-making	9	"So far, we have just informed people about the cultural heritage issues and our activities. We do not invite them to make decisions about the conservation and management of cultural and world heritage sites." (P2)
No right, belonging, pretending, unlike to engage	6	"We have no right to make decisions about cultural heritage because we live and work in it. Why aren't we included in the decision-making process if you say the Bisotun culturally and spiritually belong to the local people… the government and authorities do not like to engage people in cultural heritage. However, they pretend that the local people's opinions are important to them." (P24)
Benefiting locals	16	"I think we, as the local people, must benefit from this world heritage site. This site is an interesting place for visitors and tourists, but not for the local people..." (P17)
Listing local property in national heritage list, not archaeological site	8	"I'm not sure why my property has been designated as a national cultural heritage site. It is merely a farm with a house, located far from any archaeological site or another cultural heritage monument. That is why I cannot develop my property or change it." (P13)
Cause problems, visitor damage, destroying	9	"Cultural heritage means problems! I have a garden near the Bisotun core zone. I have to come here during the all-high seasons in order to protect my garden from visitor damage. They occasionally breach the fence and destroy the trees. Cultural heritage, in my opinion, only causes problems for locals." (P21)
Living and working are hard, property development, heritage owner benefit	7	"Living and working in a protected area is too hard. Almost all kinds of activities are forbidden. I cannot even repair my house or develop my property. Who said that my land, my inheritance, must be a part of the national heritage? What is the benefit of this cultural heritage for me, as the owner of this property?" (P14)
Economical problems	14	"This site represents our identity, our bond, and our history…the problem is that poverty and economic issues do not let the people understand the real values of cultural heritage. Most of the time, the cost of a small clay pot exceeds the wealth of a family. So, there must be a master plan for considering the economic issues as well as people's participation in the decision-making process in parallel. For example, you cannot expect effective public participation unless poverty is addressed through the tourism industry." (P23)
Promise people	10	"If they make a decision in a participatory way, will the national government allow them to implement it?" (P10)
Insufficient funding	12	"Unfortunately, we do not have a sufficient budget for this sort of research..." (P4)
National government, top-down decision-making process	6	"Now, it is a top-down decision-making process in cultural heritage management. The Ministry of Cultural Heritage, as the national government, provides us with a general plan …we have to ignore local people's opinions in order to make the process as simple as possible." (P7)
Political issues	6	"The less participation, the more favorable it is for the government. The authorities can no longer do whatever they want if people participate in political and sociocultural issues. This is what we are seeing in Iran right now." (P1)

4.2.3.2 Grouping of Initial Codes to Form Themes

Grouping initial codes to form themes is a key step in thematic analysis, which is a widely used method for analyzing qualitative data such as interview transcripts. Thematic analysis involves identifying patterns and themes within a set of data, and grouping initial codes is a way of organizing and synthesizing these patterns into broader themes. Once the initial codes have been generated, the researcher then organizes them into categories or themes based on their similarities or relationships to each other.

To group initial codes into themes, the researcher first reviews all of the initial codes and identifies the ones that relate to each other. These related codes are then grouped together to form a preliminary theme. The researcher then reviews the codes again to ensure that they all fit under the same theme and that there are no outliers or codes that do not fit. If necessary, the researcher may modify the theme or create sub-themes. Once the initial themes have been identified, the researcher then examines the data to ensure that it is accurate and complete. The researcher may also identify additional themes that were not apparent during the initial coding process. This process of refining and modifying the themes continues until the researcher is satisfied that all of the relevant data has been captured and organized. Grouping initial codes into themes is an important step in the thematic analysis process because it allows the researcher to identify and synthesize patterns within the data. By grouping related codes into themes, the researcher can gain a deeper understanding of the data and develop insights into the research question or topic of interest (Table 10).

Table 10 Grouping codes to form themes

Grouping Codes	Themes
Meaning of local people participation, Education, knowledge, attitudes, consensus, just informing, not involving in decision-making	Misunderstanding
Public participation in decision-making, mechanisms, national trend, long way	Irregularity
No right, belonging, pretending, unlike to engage, benefiting locals	Exclusivity
Listing local property in national heritage list, not archaeological site, cause problems, visitor damage, destroying, living and working are hard, property development, heritage owner benefit, economical problems, Promise people	Unwillingness
National government, top-down decision-making process, Insufficient funding, political issues	Hierarchy of power

4.2.3.3 Emergent Themes

The goal of the interviews was to find out how the participants understood and thought about two main ideas; community-based participation and iCommunity prototyped application. The analysis shows that there are five distinct themes that seem to reflect the participants' perceptions of the first concept which are *misunderstanding*, *irregularity*, *exclusivity*, *unwillingness*, and *hierarchy of power*. The second concept consists of three different themes to mirror the participants' insights which are *complexity*, *performance*, and *unwillingness*. Each theme and its sub-themes are subsequently using quotes from across the data collection.

4.3 iCommunity Prototype Application

The main outcome of this research is the prototyping of a mobile application for facilitating interactions between the Bisotun World Heritage Site and local people living in the landscape zone in a participatory approach. The iCommunity mobile app was made to make it easier for local people to help protect and manage the Bisotun World Heritage Site in a community-based participatory approach. During the participation, the needs and wishes of real users were found and put into the iCommunity app. The app was designed to make it easier for people in the community to help run and protect the site. By letting local people report problems and give feedback, the app aims to make heritage management more collaborative and community-based. The iCommunity app was made to be easy to use and available to

local people. The link below is to the final prototype of the app, which is ready to be coded. The Bisotun World Heritage Site even found a sponsor for developing and running the application, but due to the specific situation in Iran now, it may take more time. The most important features of the application are:

The iCommunity app gives users several ways to sign up and sign in with their existing social media accounts. This can make the registration process much more convenient and user-friendly. The standard questions on the registration page are probably there to get the user's name, email address, and password. This information could be used to set up the user's account and give them access to the iCommunity app's features and functions. The Bisotun will also use it as a source of community participation evaluations. Also, if iCommunity allows both individual and institutional registration, institutional users may have to answer more questions or fill out more fields, such as the name of the organization, its size or type, and the user's role in the organization. Figure 10 displays the login and registration feature of the iCommunity application.

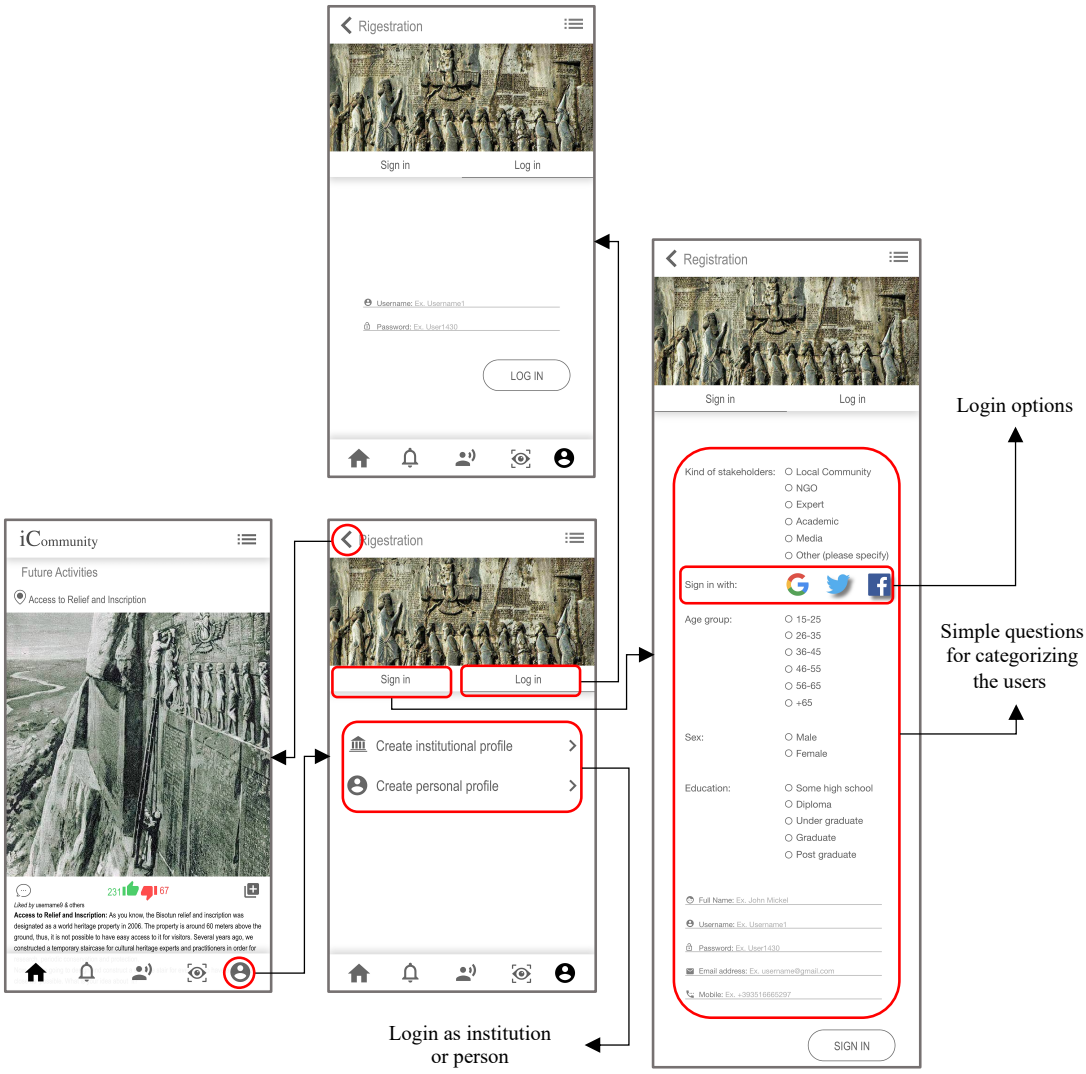


Figure 10 Login and registration feature of the iCommunity application

The Future Activities feature of the iCommunity app lets the cultural heritage institution tell the public about upcoming events and activities at the World Heritage Site. This can be a great way to get the community involved in the development and maintenance of the site. Users are able to show whether they agree or disagree with the posted activity, as well as leave comments and talk about the pros and cons. This can help encourage meaningful dialogue and different points of view. This can be particularly important in the context of cultural heritage sites, where there may be a range of stakeholders with differing views and priorities. By leveraging the power of technology and social media, iCommunity can help foster a sense of community and shared ownership around the World Heritage Site. This can not only help to increase awareness and support for the site's preservation but also enhance the overall visitor

experience and promote sustainable tourism practices. Figure 11 shows an example of posted future activity on the home page of the iCommunity application.

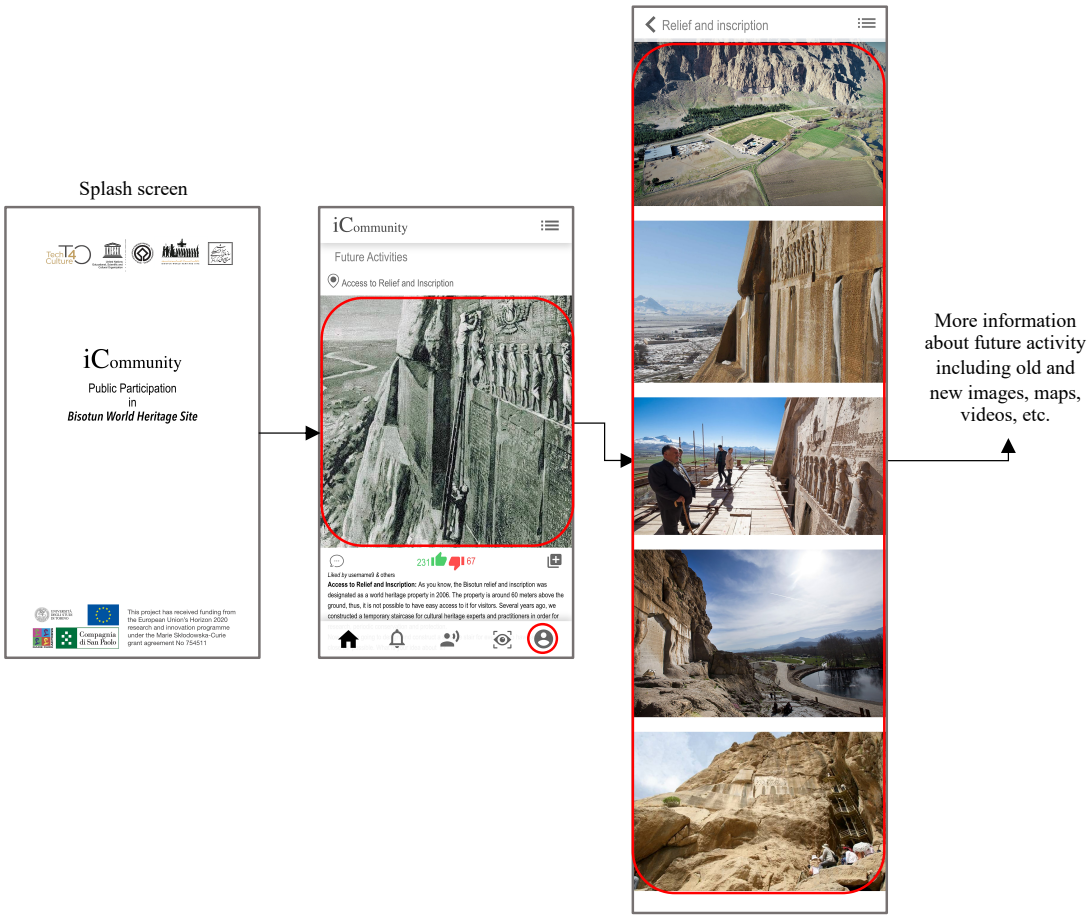


Figure 11 An example of posted future activity on the home page of the iCommunity application

Integrating Google Maps into the iCommunity app so that users can see where future events will be held can be a useful feature. It can provide a visual representation of where the activity will take place, making it easier for users to plan and attend. With Google Maps, users can easily zoom in and out to see the location of the activity in relation to surrounding landmarks, streets, and other points of interest. This can be particularly helpful for those who may be unfamiliar with the area. Figure 12 displays geographical location of the future activity on the iCommunity application.

Figure 12 Geographical location of the future activity on the iCommunity application

The comments section of the iCommunity app is a way to get people talking about the World Heritage Site and get them involved in the community. By letting users share their ideas and thoughts and talk about and debate different points of view, the application can help to create a sense of shared ownership and collective responsibility for the site's upkeep and growth. Users can ask questions, share information, and give their opinions on a wide range of topics related to the site, such as conservation, tourism, and community development, through the comments feature. This can create a platform for diverse voices to be heard and for different viewpoints to be considered. Also, the comments feature can help users of the iCommunity app feel like they are part of a group. By letting users talk and interact with each other, the app can help people make connections that go beyond the digital world. This feature is shown in Figure 13.

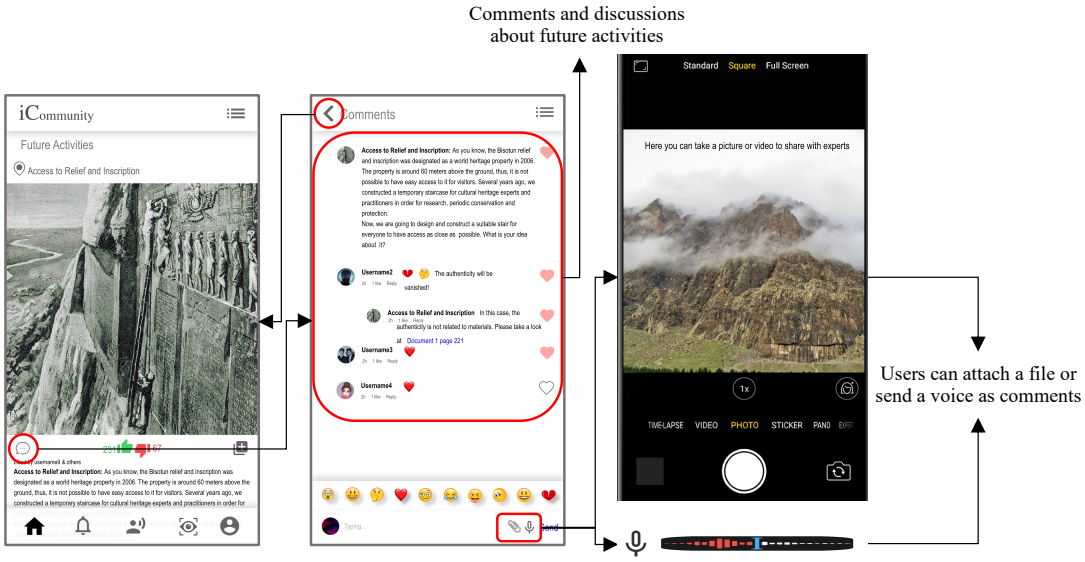


Figure 13 Users can share their ideas and discuss on the comments feature (iCommunity application)

Incorporating what people know about the Bisotun site into its management and activities can be a great way to help people understand the site's history, significance, and value in a more complete and nuanced way. This can include a wide range of information, such as old pictures, stories, videos, maps, and other forms of local knowledge and expertise. By letting users add more information to posted activities, the iCommunity app can help users tap into this valuable source of information and expertise. Users can talk about their own experiences, memories, and thoughts, which gives a rich and varied look at the site's history and cultural importance. By including citizen knowledge in the management and activities of the Bisotun site, the iCommunity application can also help build a sense of shared ownership and collective responsibility for the growth and maintenance of the site. By getting local people involved in the process, the app can make cultural heritage management more open and accessible to everyone. Figure 14 displays the process of add information to the posted activity by users.

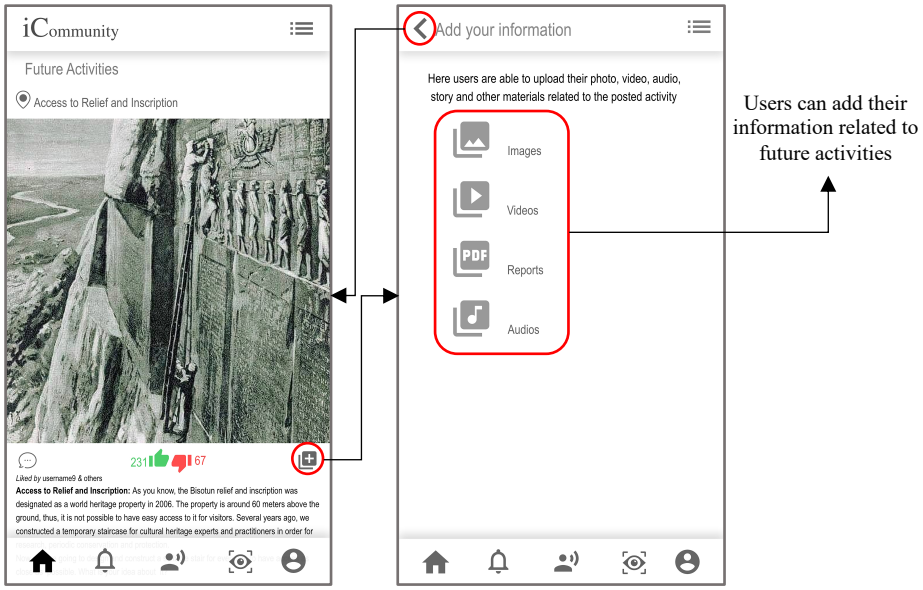


Figure 14 Users can add more information about the posted activity if they have any

Having a designated expert for each activity and project at the Bisotun World Heritage Site can be a great way to make sure that users have access to accurate and reliable information. Users can talk to the expert if they have any questions or concerns about the activity or project, which can help promote a more informed and engaged community. By adding this to the iCommunity app, users can easily get in touch with the expert in charge of a certain project or activity. This can be done through a messaging or chat feature, allowing users to ask questions, get clarifications, and provide feedback in real-time. Having a designated expert can also help make sure that the site's activities and projects are managed in a clear and accountable way. Users can be sure that the information they get is correct and reliable and that any concerns or issues they bring up will be dealt with in a timely and effective way. Figure 15 shows how users can talk with an expert if they have problems or questions about the posted activity via the iCommunity application.

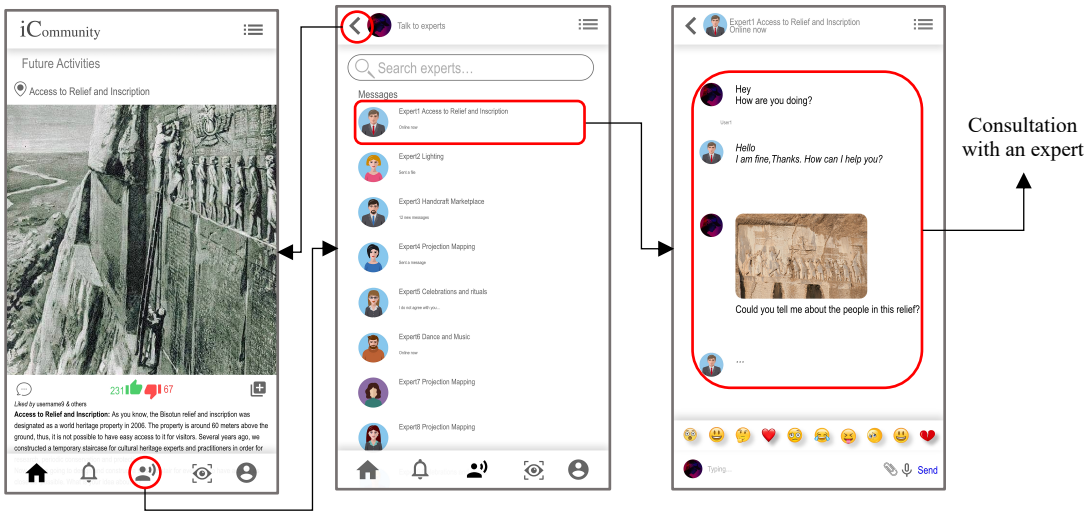


Figure 15 Users can talk with an expert if they have problems or questions about the posted activity (iCommunity application)

One of the most important things that the iCommunity app for the Bisotun World Heritage Site does is give users access to workshops and training courses about managing and preserving cultural heritage. Here are a few examples of the types of workshops and training courses that were planned in the Bisotun master plan and are applicable via the iCommunity: conservation and restoration workshops, heritage tourism training, community engagement workshops, archaeology and cultural heritage research training, and cultural heritage management workshops. The iCommunity app can be used to promote these workshops and training courses, and users can sign up for them right from the platform. The application can also give users access to online resources like webinars and video tutorials to supplement in-person training and make it possible for people to take part from afar. The Bisotun World Heritage Site can encourage its stakeholders and partners to learn and improve their skills by giving them these workshops and training courses. It can also give people and organizations interested in managing and preserving cultural heritage access to useful resources. Figure 16 shows the workshops and training courses feature on the menu of the iCommunity application.

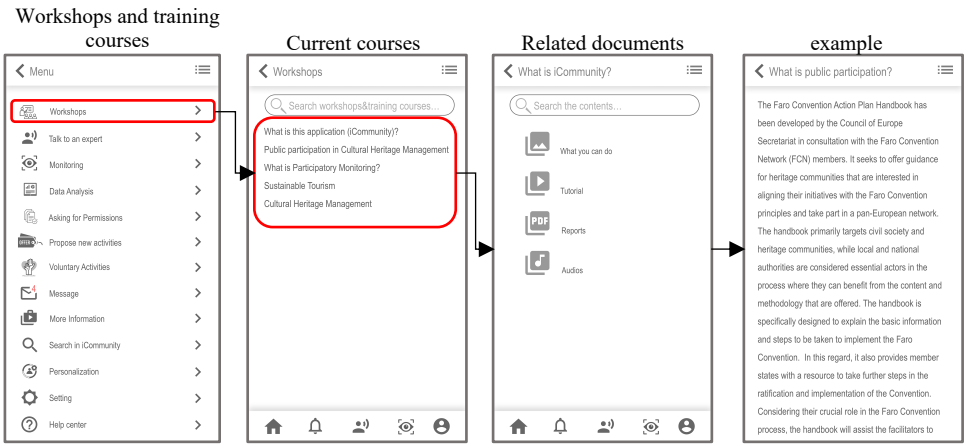


Figure 16 Workshops and training courses on the menu of the iCommunity application

The iCommunity application for the Bisotun World Heritage Site includes different kinds of notification features to keep users informed and engaged with the activities and projects happening at the site. Here are a few examples of the types of notifications that could be included:

- System notifications: The iCommunity app can send these messages automatically to let users know about new activities and projects posted on the platform, changes to activities that are already underway, and other important information. For example, users could be notified when a new workshop or training course is added to the platform or when a new project's public consultation period starts.
- Message notifications: They are set off by messages or alerts sent by other users or by the expert in charge of a certain activity or project. For example, if a user has a question about a workshop, they can send a message to the expert in charge and receive a notification when a response is received.
- Reminders and Event Notifications: These notifications can be sent to users to remind them about upcoming events, activities, or deadlines related to the Bisotun World Heritage Site. Users could, for example, get a reminder a few days before a workshop to remind them to go.

These different types of notifications can be tailored to the specific needs and preferences of the Bisotun World Heritage Site and its users. By keeping users informed and interested, the iCommunity application can help make cultural heritage

management and preservation more inclusive and user-driven. Different kinds of notification features are shown in Figure 17.

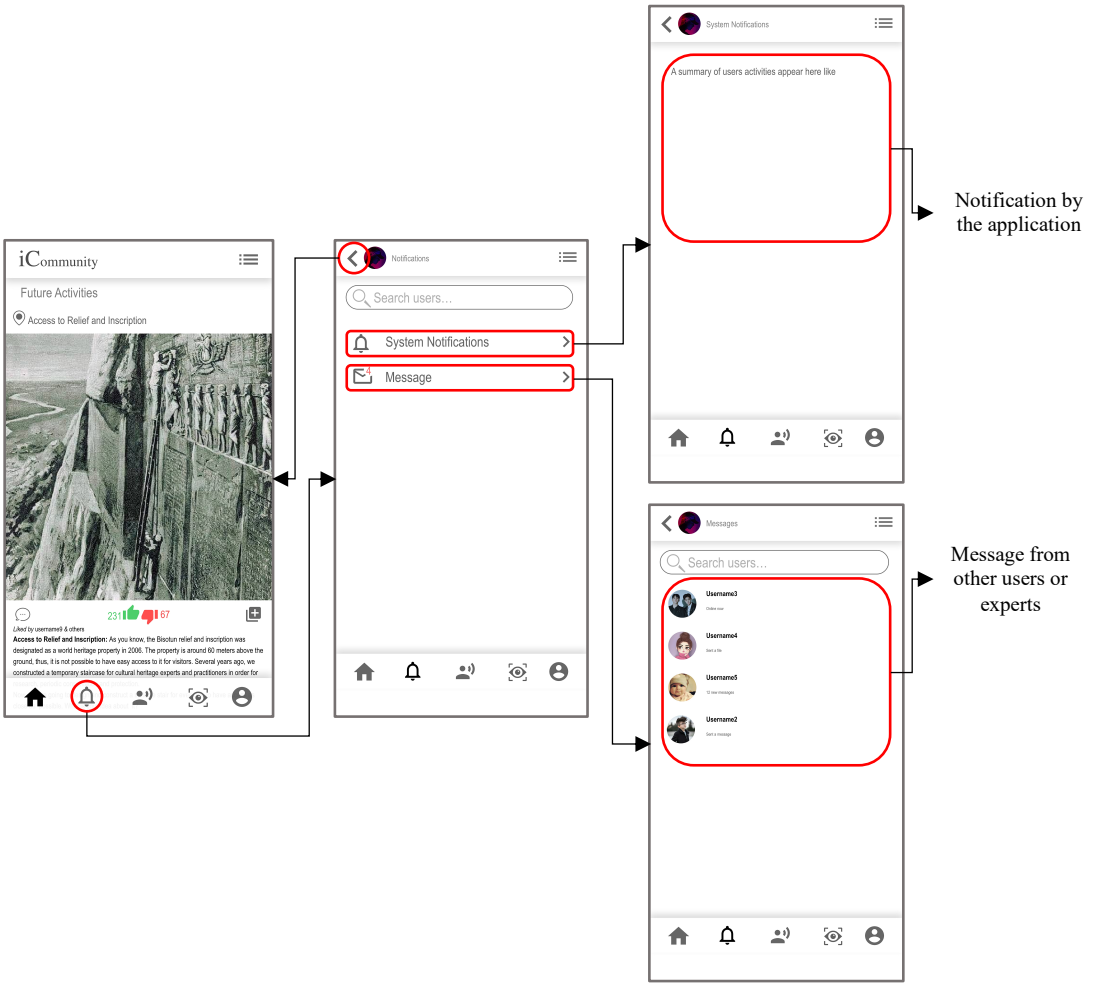


Figure 17 Different kinds of notification features on the iCommunity application

Participatory monitoring is a key part of keeping the landscape zone of the Bisotun World Heritage Site in good shape. The Bisotun World Heritage Research Base finds it hard to keep an eye on everything because the zone is so big and there are so many cultural heritage monuments and sites there. Community monitoring through the iCommunity app can help get people in the area involved in the site's care and monitoring. The iCommunity app can make it easy for people in the landscape zone to report any changes, damage, or degradation to cultural heritage sites and monuments. By involving the community in monitoring activities, the Bisotun World Heritage Site can use local knowledge and expertise to help find potential threats and take steps to deal with them.

Participatory monitoring can also help to get more people in the community involved and aware of how important it is to protect cultural heritage. By taking part in monitoring activities, people in a community can learn to care more about its cultural heritage and feel more like they own it and are responsible for keeping it safe. The iCommunity application can make it easy for people to report observations and upload photos and videos of cultural heritage sites and monuments. This makes community monitoring easier. The app can also include a feature for experts at the Bisotun World Heritage Research Base to review and respond to community reports and provide guidance on appropriate actions to take.

The iCommunity application can do more than just keep an eye on the community. It can also give regular updates and reports on the state of conservation in the landscape zone. These updates can help inform the community about ongoing monitoring efforts and progress in conservation activities. Overall, the participatory monitoring feature on the iCommunity application can be a powerful tool for engaging local communities in the conservation and monitoring of the Bisotun World Heritage Site's landscape zone. By involving the community in monitoring activities, the site can benefit from local knowledge and expertise while increasing community engagement and awareness about the importance of cultural heritage conservation. Participatory monitoring feature and its categories are shown in Figure 18.

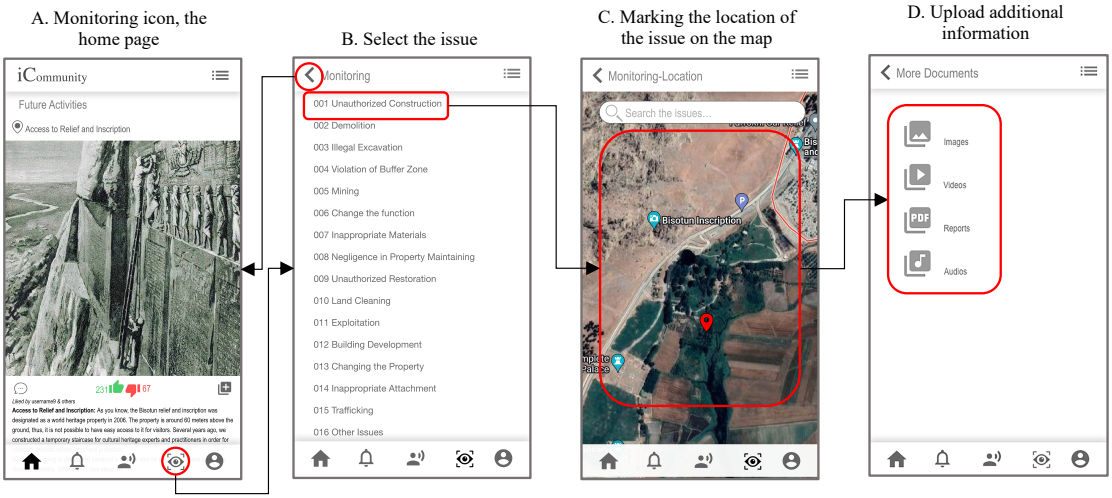


Figure 18 Participatory monitoring feature on the iCommunity application

The iCommunity App has a feature that lets you ask for permission to build in the landscape zone of the Bisotun World Heritage Site. This feature can help make sure that people in the area follow the site's rules and policies for development, which are important for preserving cultural heritage. The permission feature has an easy-to-use interface for submitting requests for different types of development projects, like building construction, demolition, excavation, core zone and buffer zone territory, mining, changing functions, building restoration, building development, farming and watering, land cleaning, infrastructure, roads, changing property, and archaeological sites.

The application makes it clear what documents and steps are needed for each request and how to send them. Once a request is made, the iCommunity Application can let the experts at the Bisotun World Heritage Research Base know about it. The experts can then look at the request and, based on certain rules and criteria, either approve it or turn it down. The application can provide regular updates on the status of each request, so local people can track the progress of their applications. The permission feature also has a way for local people to say what they think about the development projects and make suggestions. This can help make sure that the opinions and concerns of the community are taken into account when decisions about development activities are made.

In short, the permission feature in the iCommunity Application can help make sure that local people follow the specific policies and rules for development activities in the landscape zone of the Bisotun World Heritage Site. The feature can have an easy-to-use interface for submitting requests, clear instructions on the documents and steps that are needed, regular updates on the status of requests, and a way for the community to give feedback. The iCommunity Application can help protect cultural heritage by making it easier to get permission to do things that are important for responsible development. Asking for permissions feature is shown in Figure 19.

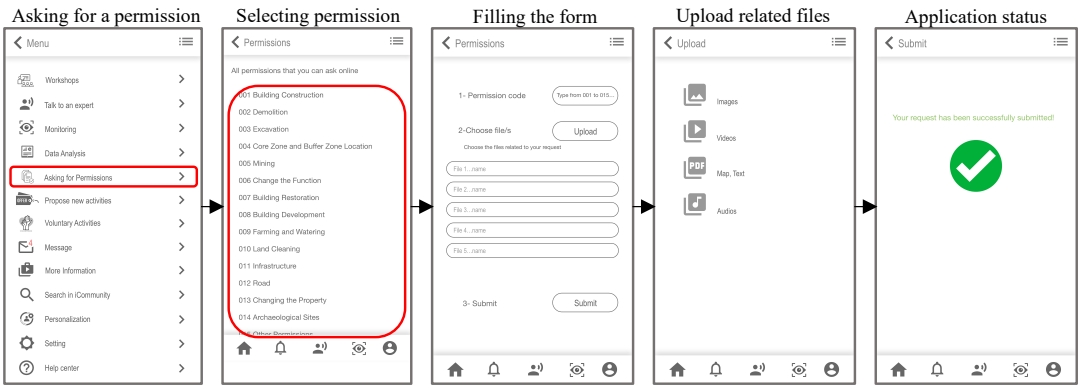


Figure 19 Asking for permissions feature

The iCommunity Application has a feature called Voluntary Positions, which lets volunteers apply for open jobs at the Bisotun World Heritage Site. The Bisotun World Heritage Site hires volunteers for some positions it needs over the course of a year. These positions most commonly involve tasks related to the conservation, management, and promotion of cultural heritage in the landscape zone. The feature has an easy-to-use interface for posting open positions, such as volunteer opportunities for monitoring, surveying, documenting, and researching cultural heritage.

The application also has clear descriptions of each position's duties, requirements, and expected results. The Bisotun World Heritage Site can also use the application to promote their volunteer programs and encourage community involvement in the conservation of cultural heritage. Once the jobs are posted, volunteers can use the iCommunity Application to apply for them. They can send in their application and tell us about their skills, experiences, and availability. The application can also give volunteers regular updates on how their application is going, so they can keep track of its progress. The Voluntary Positions feature can also provide a way for volunteers to comment and make suggestions about their experiences. This can help make sure that volunteers are happy with their jobs and that their suggestions are used to improve volunteer programs in the future. Figure 20 displays the voluntary positions feature on the iCommunity application.

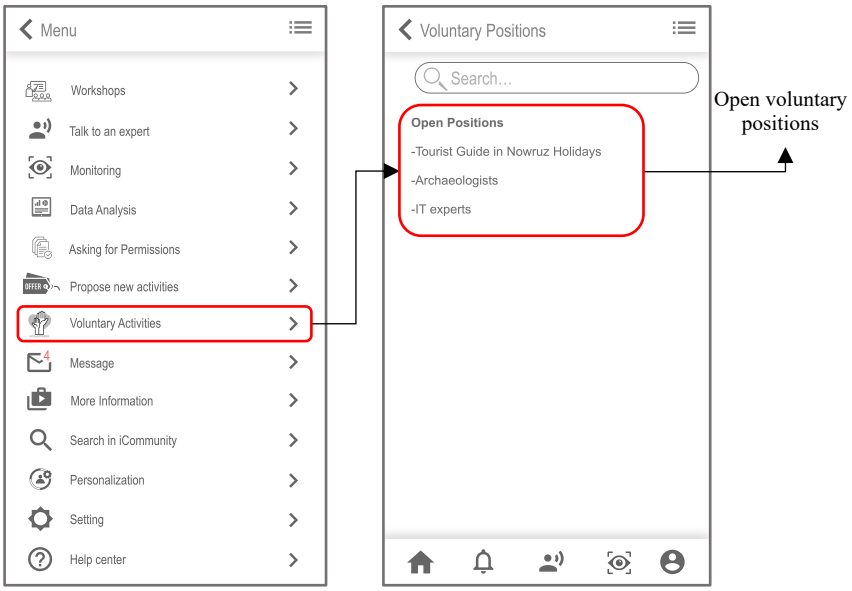


Figure 20 Voluntary positions feature on the iCommunity application

5 Chapter Five: Evaluations and Results

"I wish I could combine WhatsApp, Telegram, and Instagram so that we had access to a more effective application for the Bisotun World Heritage Site."

Participant 10, May 2021

Due to the nature of multidisciplinary studies, it is required to collect as much data as possible from the selected interviewers. In this phase, a sample size of thirty-seven persons has been chosen. The sample was drawn from a population of men and women who lived or worked in the landscape zone of the Bisotun World Heritage Site. The sample could be working in any field and there was no age limitation. The people with knowledge of using smartphone applications and social media were the target population to participate, and working directly or indirectly in the cultural heritage sector was preferred. To help the author document the level of candidate diversity in the study, participants were asked to answer brief demographic questions. The author expected 20-25 participants for the interview phase, but the final number of participants was 37.

This study employed different interviewing methods, as described in the previous chapter, in which the interviewer and the interview questions served as the instrumentation. Memos were used before, during, and after each interview to record any research-related ideas. Five interviews were digitally filmed using a Canon M50 video camera, and the rest were recorded through the Zoom H1n voice recorder and voice recorder software on a Xiaomi Mi 10 lite 5G. The interviews began with a general introduction to the daily use of smartphone applications and social media and continued with open-ended questions about the role of social media in public awareness of cultural heritage and the current situation of community engagement in the Bisotun World Heritage Site through digital platforms. The interviews were accomplished in three interview sessions in the phase of data collection which was divided into the pre-design, prototyping, and prototype test.

5.1 Hypothesis

Within the context of cultural heritage conservation and management, it is hypothesized that the strategic implementation of a mobile application designed for community engagement will significantly enhance the effectiveness of local participation and collaboration. The iCommunity Model and the corresponding mobile application serve as examples of the proposed framework's ability to close the gap between local communities and cultural heritage institutions, fostering informed interactions and collaborative efforts that support the long-term preservation of cultural heritage sites.

In the realm of cultural heritage conservation and management, the active involvement of local communities is pivotal to the enduring safeguarding of historical sites and traditions. Recognizing the importance of public engagement, the present research endeavors to develop a comprehensive framework that harnesses the potential of mobile technology to facilitate meaningful interactions between cultural heritage institutions and local residents.

Mobile applications, owing to their ubiquity and diverse functionalities, offer an innovative approach to bridging the gap between stakeholders involved in heritage management. It is postulated that a well-designed mobile application can serve as a dynamic platform that effectively communicates valuable information about cultural heritage sites while also fostering active participation from local communities. The proposed framework emphasizes the creation of an environment where community members can contribute their knowledge, experiences, concerns, and aspirations, thereby influencing decision-making processes and instilling a sense of ownership in heritage preservation.

Central to the research hypothesis is the introduction of the iCommunity Model, which serves as the blueprint for the mobile application's design and functionality. This model envisions a multi-faceted approach that combines user-friendly interfaces, interactive content, and collaboration tools to facilitate seamless engagement between cultural heritage institutions and local stakeholders. The iCommunity Model underscores the importance of inclusivity, knowledge sharing, and cooperative problem-solving, providing the foundation for the mobile application's development.

The hypothesis anticipates that the deployment of the iCommunity Model through the mobile application will lead to measurable outcomes in terms of enhanced community awareness, increased participation in conservation activities, and improved collaboration between heritage professionals and local residents. Furthermore, it is expected that the application will contribute to fostering a stronger sense of cultural identity and collective responsibility for heritage sites, thereby promoting sustainable practices and long-term preservation efforts.

5.1.1 Participants

A group of thirteen master's students in communication science at the University of Turin's Department of Computer Science tested the mock-up using predictive evaluation method in April 2022. Four students evaluated the iCommunity using the heuristic evaluation, while the rest used the mobile heuristic evaluation. The iCommunity prototype was shown to the local participants again to see what their final thoughts were.

A total of 37 people has been selected to act as the sample size. Living or working (directly or indirectly) in the cultural heritage context and using smartphones in day-to-day life were the primary categories that were considered when selecting the size of the sample. The participants' average age was 36.4 years old, and men made up 54% of the group. The youngest participant was 18; the oldest was 58. The age range of 26 to 35 was the most common among all participants, accounting for 49% of the total. The term communities of place refer to the 54% of participants who either lived or worked within the landscape zone of the Bisotun World Heritage Site. The remaining 27% and 19% of participants were classified as communities of interest and communities of practice, respectively. There were five participants who hold a doctoral degree; 62% of the participants have a bachelor's or master's degree; and nine participants hold a diploma or lower. More than half of those interviewed were from the private sector and civil society, with the remaining respondents coming from the government sector, academic institutions, and non-governmental organizations (with 22% coming from the public sector, 13% coming from academic institutions, and 5% coming from non-governmental organizations).

In order to discover the issues and problems concerning people's participation in the management and conservation of cultural heritage, interviews were conducted with a total of 28 participants. In addition to these participants, a total of nine individuals contributed their thoughts and opinions on the iCommunity application (the technique of collecting user opinions). The interview was conducted in two parts: the first was face-to-face, and the second was in focus groups. As a consequence of covid-19 quarantine, it was not conceivable to meet people face-to-face. Thus, the first interview session was conducted over voice call via WhatsApp mobile application. The second interview session was Face-to-face meetings were held in various locations throughout the landscape zone, while focus group meetings were held at the Bisotun World Heritage Site Research Base. The meetings were split into two parts: March–August 2021 and June–August 2022. Table 11 summarizes the socio-demographic characteristics of participants.

Table 11 A summary of the socio-demographic characteristics of participants

Socio-demographic Characteristics of Participants		CODE	OCCUPATION	SECTOR	POSITION	SEX	AGE	EDUCATION
	Community-based Participants	P1	Conservator	Civil Society	Community of Interest	F	38	Masters
		P2	Heritage Manager	Government	Community of Place	M	44	Masters
		P3	Engineer	Government	Community of Interest	M	52	Bachelor
		P4	Heritage Manager	Government	Community of Practice	M	31	PhD
		P5	Engineer	Civil Society	Community of Interest	F	28	Masters
		P6	Accountants	Government	Community of Place	M	55	Bachelor
		P7	Content Specialist	Government	Community of Practice	M	32	Masters
		P8	Conservator	Government	Community of Practice	M	27	Bachelor
		P9	Conservator	Government	Community of Place	M	58	Bachelor
		P10	Engineer	Academia	Community of Place	F	43	PhD
		P11	Shopkeeper	Civil Society	Community of Place	M	35	Diploma
		P12	Shopkeeper	Civil Society	Community of Place	F	41	Diploma
		P13	Butcher	Civil Society	Community of Place	M	33	Diploma
		P14	Shopkeeper	Private	Community of Place	F	34	Bachelor
		P15	Archaeologist	NGO	Community of Interest	M	28	PhD
		P16	Student	NGO	Community of Interest	M	26	Masters
		P17	Journalist	NGO	Community of Place	F	25	Masters
		P18	Journalist	NGO	Community of Interest	F	31	Masters
		P19	Farmer	Civil Society	Community of Place	M	48	Diploma
		P20	Farmer	Civil Society	Community of Place	M	36	Bachelor
		P21	Farmer	Civil Society	Community of Place	M	40	Diploma
		P22	Farmer	Civil Society	Community of Place	M	49	Bachelor
		P23	Tour Guide	Civil Society	Community of Practice	M	37	Masters
		P24	Tour Guide	Civil Society	Community of Practice	M	29	Masters
		P25	Tour Guide	Civil Society	Community of Practice	F	33	Bachelor
		P26	Tour Guide	Civil Society	Community of Place	F	30	Bachelor
		P27	Tour Guide	Civil Society	Community of Place	M	41	Bachelor
		P28	Archaeologist	Academia	Community of Place	F	47	PhD
	Collection of User's Opinions	P29	Lawer	Government	Community of Interest	F	46	Masters
		P30	Professor	Academia	Community of Place	F	53	PhD
		P31	Archaeologist	Academia	Community of Practice	F	27	Masters
		P32	Housewife	Civil Society	Community of Place	F	26	Bachelor
		P33	Driver	Private	Community of Interest	M	29	Diploma
		P34	Housewife	Civil Society	Community of Interest	F	26	Diploma
		P35	Rancher	Civil Society	Community of Place	M	36	Diploma
		P36	Student	NGO	Community of Interest	F	27	Masters
		P37	Student	Academia	Community of Place	F	18	Diploma

5.1.2 Apparatus and Materials

The following section outlines the apparatus and materials utilized in the research study investigating community participation in the conservation of a World Heritage Site using a smartphone application. The study aimed to assess the effectiveness of the iCommunity prototype application in engaging community participation and collect data on community perceptions and feedback on the application.

iCommunity Prototype Application: The iCommunity prototype application was designed using Adobe XD software. Adobe XD is a user-friendly software with the capability of creating interactive prototypes. This software was selected because it allowed for the creation of a prototype application with ease and convenience. The iCommunity application was designed with features that allowed community members to provide feedback on the condition of the Bisotun World Heritage Site, report issues, and interact with other community members. In April 2022, a heuristic evaluation for the iCommunity prototyped smartphone application was done by four Master of Science in Communication, ICT, and Media students as a task in the course Human-Machine Interaction: Advanced Approaches, Advanced Human-Computer Interaction. Nine students evaluated the iCommunity application by utilizing the heuristic evaluation method. Furthermore, the application was evaluated by eight users, including five locals and three cultural heritage experts, at the Bisotun World Heritage Site in July 2022.

WhatsApp: WhatsApp was used to conduct remote interviews during the COVID-19 lockdown period. It was chosen due to its convenience and ease of use. It provided an opportunity to conduct interviews without violating social distancing protocols. The app allowed for voice and video calls, and its use ensured that the research could be conducted remotely, safely, and effectively.

Audio Recorder: The Zoom H1n audio recorder and audio recorder software on Xiaomi 10 lite 5G were used to record the interviews conducted for this research. they were selected for their high-quality sound recording capabilities and portability. The Zoom H1n recorder is a reliable and compact audio recording device that provides crystal-clear audio recording, even in noisy environments. This recorder was used to record the audio data collected during interviews and group discussions.

Mirrorless Camera Canon m50: The Canon m50 camera was used to film four interviews conducted for this research. The camera was selected for its high-quality video recording capabilities and portability. The Canon m50 camera is compact, easy to use, and can produce high-quality videos.

Microsoft Excel: Microsoft Excel was used for analyzing the data collected during this research study. It was selected for its ability to perform statistical analysis and data visualization. Microsoft Excel allowed for the presentation of data in tables, charts, and graphs, which facilitated the identification of trends and patterns in the data. The software's ability to perform various types of analysis and calculations made it an essential tool for analyzing the data collected during the study.

5.2 Results

5.2.1 Community-based Participation Themes-Based on Interviews

In the community participation concept, participants described a wide variety of reasons that show they misunderstand the concept of community participation in cultural heritage conservation and management in general and community-based participation in the Bisotun World heritage site in particular. Surprisingly, this concept not only confuses the local people, but the authorities also do not have a clear understanding of it. For instance, most of them assumed that community participation means using private sector resources to help the government in a specific project.

Another main theme in this concept is the *irregularity* in the community participation approach which is super important in including the local people in cultural heritage conservation. The Bisotun World Heritage Site like other cultural heritage institutions in Iran looks at community participation as a single project with a single starting point and an ending point. As it has been mentioned before, the community participation approach is a long-term and never-ending project within an iterative process. Thereby, some participants argued that *irregularity* in the community participation approach has weakened the effectiveness of people's participation in cultural heritage conservation and management. There is also no mechanism and supportive framework for the long-term involvement of locals in the decision-making process at the Bisotun World Heritage Site, however, the institution is planning to engage the local community in some specific projects.

Exclusivity is the next theme that some participants have described in the community participation concept. The current community-based participation approach at the Bisotun World Heritage Site focuses on a specific program by involving a specific group of the local community. For example, archaeology for kids was a single flash program in participating kids in cultural heritage activities. Or there was a particular capacity-building course for local people who were working on tourism activities at the Bisotun World Heritage Site.

Some participants defined a kind of *unwillingness* in participating in cultural heritage conservation and management. This *unwillingness* arose because of a lack of a comprehensive community-based approach and selectiveness on the site. The managers of the Bisotun World Heritage Site select the programs and activities for asking people to participate. This selection of programs and activities does not cover the interests and wishes of all local communities living in the landscape zone. So, most locals do not have an opportunity to be involved in. The last theme in this concept is the *hierarchy of power* in the government structure. Basically, in general, theocracy tends to have control over all political, social, and cultural activities. Totalitarianism is a serious issue in the community-based participatory approach.

In relating to the second concept, iCommunity application, the participants mentioned three main themes. The first survey was conducted before prototyping the. application. The first theme is *complexity* in the iCommunity application. The participants said that since this application will be used on a local scale for local people, it is required to design a very simple and user-friendly interface. The next theme is the concept was the *performance* of the prototyped application that should regularly be updated and support the users, 7 Days a Week, 24 Hours a Day. The last main theme is the *unwillingness* in using smartphones in general and new applications in particular which is normal.

5.2.1.1 Theme One: Misunderstanding

Misunderstanding is the main theme extracted from analyzing the data. This *misunderstanding* is divided into two main categories: *misunderstanding* of the concept of public participation and *misunderstanding* of cultural heritage ownership. The majority of participants misunderstood the meaning of the concept of people's

participation. Approximately 80% were unaware that participation entails involving people in decision-making and implementing what they want and wish in projects. For instance, participant 12 mentioned:

> *"What do you mean by local people participation? Do you mean we must get local people's opinions about all activities that we want to apply at the Site?*
>
> *Participant 12, August 2021*

This opinion might arise from the lack of people's awareness of their cultural heritage rights. Furthermore, the methods of governance and democracy result in the idea that people do not have such a right to decision-making in a cultural heritage context. Inadequate knowledge for the public to understand the values of cultural heritage is another subtheme that is placed under the *misunderstanding* theme. Some of the participants believed that locals might not be able to decide on matters pertaining to cultural heritage. One of the interviewees said:

> *"People's participation in decision-making in cultural heritage management, really? I do not know how it is possible to apply people's decisions to the management and conservation of a cultural heritage site. It is more likely to ask people's opinions about the projects that we implement at the Bisotun site, but we cannot give the whole decision-making process to the locals. They are not experts in cultural heritage sciences."*
>
> *Participant 8, April 2021*

This participant raised the question of how locals can make a decision on a subject in which they are not experts. The answer to this question depends on the fact that a cultural heritage institution's job is to help people, not to be in charge of them. In a participatory approach, the experts' only job is to make it easier for the people to get involved in the project. Others thought that while locals might be able to decide on cultural heritage, reaching a consensus among them with various experiences, levels of education, and skill sets would be too challenging. Participant 5 declared:

> *"It is too difficult to reach a consensus with local people with diverse backgrounds and various attitudes about cultural heritage issues. It might happen after a long period of time if we improve their knowledge of cultural heritage values."*
>
> *Participant 5, April 2021*

One of the cultural heritage issues is a *misunderstanding* of the concept of cultural heritage ownership. Who is the owner of cultural heritage—the people or the government? During the interview, one participant said:

> *"The government is the owner of all cultural heritage properties. I do not think that people can make a decision about cultural heritage. When the government implements a buffer and core zone policy without considering local people's opinions and builds a boundary and limitation for cultural heritage sites, I understand that they are in charge of the protection and conservation of cultural heritage, not people."*
>
> *Participant 1, June 2022*

According to Article 27 of the World Heritage Convention, one of the most important objectives of the convention is "to increase the participation of the local and national population in the protection and presentation of heritage" in order to encourage support for the World Heritage Convention (UNESCO, 2011). In addition, in 2017, according to the 39th session of the committee, the participation of local and indigenous peoples, governments, non-governmental and private organizations, and other stakeholders in the conservation of world heritage properties was necessary to have shared responsibility with the state party. All state parties are encouraged to prepare nomination dossiers with the widest possible participation of stakeholders to demonstrate that prior and informed consent of indigenous people has been obtained (Committee, 2021). But what happens in practice with the world heritage inscription in Iran is controversial.

In fact, state parties are responsible for all stages of the nomination process. They decide which properties to include on its tentative list, which properties on its tentative list it will nominate, and when for world heritage listing, and they are also responsible for the continuing protection and effective management of the property to meet the requirements of the World Heritage Convention. Thereby, the question that arises here is: what is the position of the locals? According to the quotation, the role of local people in the decision-making process is not defined, and basically, no role has been assigned to the local people. He said:

> *"In Iran, almost all world heritage sites have a Board of Trustees, which comprises eleven persons, including the provincial governor, Mayer, the general manager of cultural heritage, an economist, a lawyer, and veterans of cultural heritage in the province where the world heritage site is located. As you can see, there is no position for ordinary local people who have no sociocultural or political status."*

Participant 25, March 2021

This Board of Trustees is a legal committee supported by the Ministry of Cultural Heritage. The Board is responsible for considering and ratifying the master plan for a given world heritage site. Because the national government funds almost all activities and projects at a world heritage site and appoints the board, the decision-making process is top-down rather than bottom-up. Participant 7 clarified that:

> *"Now, it is a top-down decision-making process in cultural heritage management. The Ministry of Cultural Heritage, as the national government, provides us with a general plan for conservation and management, and we are obliged to ratify our projects before applying for and allocating financial resources. They send the allocated financial resources to the provincial branches of the Ministry, known as the local government. Then we have to follow the local government's desires for the projects. I would like to say that the role of people in this process is not clear, and it does not have any legal support. So, we have to ignore local people's opinions in order to make the process as simple as possible."*
>
> *Participant 7, July 2022*

Neither national policy nor international documents explicitly state the position of local people in the decision-making process. For example, there is no indicator to demonstrate how the World Heritage Committee evaluates indigenous participation. Although some parts of the nomination dossier include local participation, the measurement system of the World Heritage Committee for participation is ambiguous. After that, in the resource manuals, it is unclear to what extent local people must participate. They must just inform and obtain confirmation, which is exactly the lowest level of participation, according to A Ladder of Citizen Participation. Or local participation must be at the level of citizen power. Moreover, the role of locals in the conservation and presentation of cultural heritage inscribed on the World Heritage List is ambiguous. Basically, local people do not know much about what exactly *world heritage* properties mean. The idea of inscribing a given property on the global agenda is very attractive. Increasing national and international tourism, international financial assistance, international cooperation in conservation, etc. are the main things that local people understand about the world heritage listing. But this glamorous, deceptive idea has a number of hidden losses for locals, at least in Iran, such as limitations for developing projects. The best example, in this case, is the Dresden Elbe Valley, which was inscribed on the World Heritage List in 2004 and delisted in 2009. So, if local

people understand the consequences of living in world heritage sites, most often they won't like to be on the World Heritage List. Thus, there will probably be no World Heritage List in the near future! In this case, one of interviewee mentioned:

> *"We have no right to make decisions about cultural heritage because we live and work in it. Why aren't we included in the decision-making process if you say the Bisotun culturally and spiritually belong to the local people? I do not think the local people can legally make a decision for the conservation and management of the Bisotun. I mean, the government and authorities do not like to engage people in cultural heritage. However, they pretend that the local people's opinions are important to them."*
>
> *Participant 24, August 2021*

This situation might also be affected by the international documents relating to this topic. It seems that the role of local and national people as the main owners of cultural heritage has been underestimated. According to the UNESCO World Heritage Convention's website, to answer the question of "who owns a site once it's inscribed on the World Heritage List?," it says that "the site is the property of the country on whose territory it is located, but it is considered in the interest of the international community to protect the site for future generations" (UNESCO, 2022). According to the Universal Declaration of Human Rights, article 27, "everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits" (Assembly, 1948).

Literally, the definition of cultural places means cultural, temporal, and geographical limitations. These limitations come from core, buffer, and landscape zone policies in order to achieve maximum protection. However, because we are dealing with sociocultural phenomena, which are not static, local people are continuously faced with these limitations. During past decades, individual cultural heritage sites, such as the Bisotun World Heritage Site, have traditionally been focused on the administrative and legislative aspects of cultural heritage management, which is now becoming increasingly inappropriate for achieving long-term sustainable conservation and management. On a broader social level, the growing awareness and vocalization of local people's and other communities' claims to land places draws attention to the complexities of interest in sites within any landscape; this latter process results in increased indigenous and community involvement in sites and area research and management (Boyd, Cotter, O'Connor, & Sattler, 1996).

A number of participants also stated that, despite the fact that the concept of local involvement in the broad sense appears to be understood, it was unbelievable for them to be given control over the decision-making process, which is the maximum level of participation. According to a statement made by a member of a non-governmental organization (NGO) working in the cultural heritage conservation and management sector, he mentions:

> *"As an NGO, we really like to be engaged with cultural heritage issues. We asked them several times how we could assist them in different situations. There has been some collaboration not only with the Bisotun World Heritage Site but also with cultural heritage institutions in general. But the problem is that they have never asked us to participate in the decision-making process. The maximum extent of our participation has been collaboration on some specific projects and situations, not in decision-making."*
>
> *Participant 26, March 2021*

Twelve participants mentioned that local people have inadequate knowledge to understand the cultural heritage authorities and local people's positions in dealing with cultural heritage issues. In the past decades as has been highlighted in the literature review chapter, a real partnership relationship between cultural heritage institutions and people was not formed in Iran. The term participation is mostly used for a partnership between the government on the one hand, and the owner of cultural heritage property registered in the national cultural heritage list on the other hand, in restoration, conservation, and rehabilitation of the cultural heritage property. In this way, the government supports the owner in the conservation of the cultural heritage property by the means of allocating financial resources.

The real means of people's participation in the cultural heritage decision-making process is a new concept in Iran. Although Iranian men have had political suffrage since 1911 (and Iranian women since 1963), their participation has been limited to politics. In the Bisotun World Heritage Site, people's participation is limited to some workshops and events through special programs. Another participant emphasized that:

> *"For me, the people's participation means holding educational courses for local people and groups who are interested in cultural heritage topics in order to improve their knowledge about cultural heritage conservation. For instance, we held different workshops and training courses on tourism management, archaeological excavation for kids, etc. We also invited local people and NGOs to help us organize some special events, such as the Nowruz celebration."*

Participant 27, June 2021

5.2.1.2 Theme Two: Irregularity

The *irregularity* of participation is the second issue that can be gleaned from the interviews, and it refers to the fact that participatory methods are not always used. In fact, the cultural heritage master plan doesn't include the participatory approach for all projects, so sometimes, based on the institution's needs, it is implemented. In this case, the manager of the Bisotun World Heritage Site said:

> *"The Ministry of Cultural Heritage occasionally sends us official circulars on people's participation in cultural heritage conservation and management. I think there is a national trend toward engaging people in cultural heritage issues, but there are no systems or mechanisms for how to apply them. We are in the early stages of involving people, and we have a long way to go."*
>
> *Participant 4, July 2022*

Participatory methods shouldn't just be used for one activity; they should be used for all of them so that people feel like they are actually taking part in the activities they are implementing. Also, the people need to have faith in the institution, and the best way to earn the people's faith in an institution is to involve them in everything that happens there. People who take part in select projects get the impression that other projects are out of reach for them because they are not eligible to engage in some projects. Or, they can say that some projects are top secret or have financial benefits that the organization wants to implement in secret without involving people. A local person mentioned:

> *"As a local, I do not know exactly what they are doing at the Bisotun World Heritage Site. I occasionally notice that they are repairing a section of the site. Sometimes they change the site's furniture or hold a workshop and ceremony on specific days. Although I visit the Site almost every two weeks, I have never had a chance to participate in their ceremonies or workshops. Actually, this is the first time that someone has asked me about the position of local people in the conservation and management of the Bisotun."*
>
> *Participant 19, August 2022*

In most cases, the use of only one level of public participation (such as the informing level, for instance) is considered a participatory approach. However, this is not the case at all. It should be emphasized once more that the people's participation approach is a method that necessitates informing, consulting, involving, collaborating with, and giving people power over the decision-making process. In this scenario, the

participatory approach is a package deal, and it is not possible to consider just one step to be the entire process. An employee working in the cultural heritage sector made the statement:

> *"So far, we have just informed people about the cultural heritage issues and our activities. We do not invite them to make decisions about the conservation and management of cultural and world heritage sites."*
>
> *Participant 2, August 2021*

Another possible reason for ignoring this method is that there is insufficient funding allocated specifically for the implementation of participatory approaches. The plan for the annual budget does not include any provisions for the engagement of people in the protection and management of cultural heritage. Even though the budget includes a very little amount of money labeled for the organization of events and workshops, that money will not be sufficient. in this particular instance, a participant debated:

> *"Unfortunately, we do not have a sufficient budget for this sort of research. Most of the budget allocated for the conservation and protection of world heritage sites are construction budgets that can be spent on development projects. So, it is not simple to launch an activity such as a community engagement project for which there is no money to allocate."*
>
> *Participant 18, March 2021*

As was discussed in the previous topic, some events employ a semi-participatory approach because the concept of people's participation is misunderstood. Because of this *misunderstanding*, the method of engagement is often done in a random way and in specific situations. One of the participants thought about this issue and said:

> *"The maximum extent of our participation has been collaboration on some specific projects and situations, not in decision-making."*
>
> *Participant 28, June 2021*

As a consequence of this, the feedback that the local people provide regarding the participatory approach is disconnected, which can make the *irregularity* more compli cated. When people can't see the engagement strategy being used regularly, their level of dissatisfaction and loss of trust in the cultural heritage institution goes up. Accordingly, an interviewee argued:

> *"People occasionally provide us with feedback on people's participation in cultural heritage conservation and management. As a result, we invite them to attend some events, such as workshops and training courses, that we plan for the public."*

Participant 15, August 2022

On occasion, the local governors will demand that the Bisotun site carry out an activity that runs counter to the principles outlined in the World Heritage Convention regarding how the site should be preserved and managed. In this scenario, one of the options consists of informing local people as well as activists who are concerned about cultural heritage about the situation. In this case, one of the options is informing local people and cultural heritage activists about the situation. As the local attorney general, they have the power to make politics stop. One participant mentioned:

> *"Actually, people have so far helped us in several situations. The national government sometimes forces the Bisotun Site to apply for some projects. Last year, for example, the provincial governor ordered us to build an artificial waterfall on Bisotun Mountain! The Bisotun Research Base did not have that much power to ignore it. So, we invited some NGOs and local people to come here [Bisotun World Heritage Site] and shared the problem with them. They brought the issue to the press and social media, and they forced the provincial governor to forget the project."*

Participant 3, July 2022

5.2.1.3 Theme Three: Exclusivity

The third overarching theme that emerges from this examination is *exclusivity*. The concept behind this issue stems from the fact that people are excluded from various stages of protection. After being added to the list of national or world heritage sites, a particular cultural heritage site is obligated to receive the adequate protection and management it requires. There are currently no plans in place to include people in the process of registering properties for inclusion on either the national or world heritage lists. Because of this, the problem of *exclusivity* is clear right from the beginning of the conservation process. One of the local people stated:

> *"No one asked me about designating the Bisotun as a world heritage site. Even before that, I did not find out when the site had been registered on the national heritage list. I just know that the Bisotun has been a protected area by the [Iran] Cultural Heritage Organization since several years ago, and we [people] are not allowed to do some activities without the permission of the [Iran] Cultural Heritage Organization."*

Participant 6, April 2021

This problem not only prevents locals from participating in various stages of the preservation and management of cultural heritage, but it also lessens the general public's awareness and comprehension of the significance of cultural heritage sites. When local residents are excluded from the process of preserving cultural heritage, their

interpretations of its values are also going to change. They no longer have faith in the particular institution because they have been excluded from it. Consequently, social trust has gone down because people are getting their news from places other than official channels, like social media and the internet. It follows that the importance of time in a participatory approach cannot be overstated. It must be put into practice as soon as possible in order to achieve the most effective results. According to one of the people who took part in the interviews, participation in the conservation and management of cultural heritage should begin in elementary school and continue through effective participation in cultural heritage institutions. Accordingly, she argued:

> *"I have never been invited to or participated in educational courses on cultural heritage knowledge. I am living in a cultural heritage zone, so I must know the importance of cultural heritage. Even in our schools, we do not have a single lesson about it. I know what I know by obtaining information from social media and visiting cultural heritage sites."*
>
> *Participant 20, April 2021*

The *exclusivity* not only has a negative impact on local people, but it also influences the management of the institution. We are dealing with socio-cultural *complexity* at the Bisotun World Heritage Site, which makes the management complicated and multifaceted. Most of the time, the best way to solve problems at that site is to use the knowledge of everyone there. Exclusiveness is the root of the lack of shared knowledge in the decision-making process, which could make managing the Bisotun challenging. The director of the site mentioned that there are occasions in which more than one option stands for the preservation and protection of the Bisotun; consequently, they are required to reach a consensus regarding which strategy is the most appropriate, based on collective wisdom. He said:

> *"Most often, it is very difficult to make the right decision about the conservation and management of the site, and it is required to collect and argue different ideas about it. For instance, we are going to design and run a project to find a way to make the visit of the relief and inscription possible, which are about 60 meters high from the pedestrian level. To do that, we have to build a safe staircase or construct an elevator, both of which change the appearance of the site with maximum intervention. We have not reached an agreement on whether or not it is a good idea to build it. So, local people can help us make the right decisions."*
>
> *Participant 16, June 2021*

5.2.1.4 Theme Four: Unwillingness

The fourth theme identified by this research is *unwillingness*. Two main factors led to this disinclination. On the one hand, the authority is reluctant to involve the community in the process. In contrast, locals don't want to take part, which brings us to our second point. It is easier for authorities to make decisions behind closed doors rather than suffer through lengthy and open-ended projects like a participatory approach. Participant 18 mentioned:

> *"I wanted to participate in the Bisotun site several years ago. I came to the Bisotun office and told them I was ready to help them with whatever they desired, but there was no specific plan for engaging people in the process. They do not know exactly what they would like to do in this case. It seems that they do not want to involve people on the Site."*
>
> *Participant 9, August 2021*

Even if the authority of the cultural heritage institution would like to apply their activities or projects in a participatory way, there is no funding allocated for it. Participant 22 said:

> *"Unfortunately, we do not have a sufficient budget for research. Most of the budget allocated for the conservation and protection of world heritage sites are construction budgets that can be spent on development projects. So, it is not simple to launch an activity such as a community engagement project for which there is no money to allocate."*
>
> *Participant 18, June 2021*

The designation of Bisotun as a World Heritage Site would have a negative impact on the day-to-day activities of the locals. In order to guarantee the preservation of the world heritage site's outstanding values, strict policies for protecting the core, buffer, and landscape zone have been established. These regulations restrict what locals can do there. In the Bisotun landscape zone, there are many industrial areas, farmlands, mines, and villages, and the overall population of those places is approximately 10,000 people who work and live there. One of the locals stated:

> *"Living and working in a protected area is too hard. Almost all kinds of activities are forbidden. I cannot even repair my house or develop my property. Who said that my land, my inheritance, must be a part of the national heritage? What is the benefit of this cultural heritage for me, as the owner of this property?"*
>
> *Participant 14, April 2021*

These limitations might even disrupt local people's lives. Locals have been living and working in the Bisotun village without any restrictions for millennia. But after designating the site as a national heritage, they had to leave their village and relocate from the core zone to another area. This situation has been aggravated by its designation as a World Heritage Site. In this regard, one interviewee, who has to move her livestock regularly from one side of the core zone to the other, expressed her concern. She mentioned:

> *"This is the route [the core zone of the Bisotun World Heritage Site] that my forefathers took every day for millennia to go cattle ranching. There is no other way to traverse the Bisotun mountain slope. After designating the site as a national cultural heritage site, they blocked the route, so it is too difficult to find another way to pass. Every day, I have to come here and ask them to let me go. If they want to engage people in the conservation and management of the site, they must first solve the simple problems that we face."*
>
> *Participant 22, April 2021*

Sometimes the issues that are brought up for local people are not because of the policies regarding cultural heritage conservation; rather, they occur as a result of living in close proximity to cultural heritage sites, particularly in the core and buffer zones. It is possible for the locals to experience a variety of difficulties during the high season due to a large number of tourists. For example, during the holidays, local residents have to endure frustrating traffic jams. People in these places are unhappy with their cultural heritage, which makes them less likely to take part in activities related to cultural heritage. Another participant in the discourse said:

> *"Cultural heritage means problems! I have a garden near the Bisotun core zone. I have to come here during the all-high seasons in order to protect my garden from visitor damage. They occasionally breach the fence and destroy the trees. Cultural heritage, in my opinion, only causes problems for locals."*
>
> *Participant 21, August 2021*

Economic poverty is another reason behind this *unwillingness*, particularly where a cultural heritage property does not directly benefit the local economy of the people who live in the area. A local resident complained:

> *"This site represents our identity, our bond, and our history. It gives us a sense of unity and belonging within a group and enables people to have a better understanding of past generations and their own origins. But the problem is that poverty and economic issues do not let the people understand the real values of cultural heritage. Most of the time, the cost of*

a small clay pot exceeds the wealth of a family. So, there must be a master plan for considering the economic issues as well as people's participation in the decision-making process in parallel. For example, you cannot expect effective public participation unless poverty is addressed through the tourism industry."

Participant 23, July 2021

A participant who reminded the previous quotation said:

"I think we, as the local people, must benefit from this world heritage site. This site is an interesting place for visitors and tourists, but not for the local people. I occasionally come there to show the Bisotun to my friends and our family acquaintances, but there is no difference between me as a local and other regular visitor."

Participant 17, July 2021

The cultural heritage organization will establish a specific core and buffer zone for a monument or site once it has been added to the national heritage list. The buffer zone can sometimes extend far beyond the core zone, depending on its cultural domain. Each buffer zone has its own set of policies that may limit the activities of the locals. When the process of designating a property on the national heritage list and determining the core and buffer zones has been completed, it may be difficult for the general public to understand the rationale behind the policies that are in place in the core and buffer zones. In this situation, adopting a participatory strategy before designating the site as a national or world heritage property is the only way to persuade people. So, some of the people who were interviewed didn't understand why they had to follow cultural heritage policies when their properties didn't have any cultural heritage and there were no archaeological sites nearby. One of the participants complained:

"I'm not sure why my property has been designated as a national cultural heritage site. It is merely a farm with a house, located far from any archaeological site or another cultural heritage monument. That is why I cannot develop my property or change it."

Participant 13, March 2021

5.2.1.5 Theme Five: Hierarchy of Power

The final topic that will be covered in this inquiry is the *hierarchy of power* within the administrative system of the government. The theocratic side of Iran's government holds more influence and control, despite the fact that Iran's government structure presents itself as democratic while actually being a theocracy. In general, a theocracy

will tend to control everything, including political, social, and cultural activities. Totalitarianism could be seen as a big problem in the context of the community-based participatory approach. One of the most defining aspects of totalitarianism is its absolute monopoly on all forms of public communication (newspapers, for example). So, in this case, it's possible that a long-term approach based on participation will be either impossible or very hard to put into place. One of the interviewees declared that:

> *"The less participation, the more favorable it is for the government. I think the problem is that the government in general does not want people to engage. Even in political events, the national government would not like people's participation. Because they want to select the very person they want to be in power. The authorities can no longer do whatever they want if people participate in political and sociocultural issues. This is what we are seeing in Iran right now."*
>
> *Participant 1, July 2022*

During past centuries, the *hierarchy of power* has not allowed for the formation of a system to engage the people in the decision-making process. Furthermore, the lack of systematic methods in people's participation in cultural heritage management resulted in the adaptation of a practice error-correction strategy in this case. Therefore, it could be a long way to achieve effective participation, particularly in cultural heritage conservation and management in Iran. One of the local participants mentioned:

> *"As a cultural heritage practitioner who has been working on cultural heritage conservation for more than fifteen years, I can say that we do not have any method or system for implementing public participation."*
>
> *Participant 10, July 2022*

Another person who was interviewed indicated that the participation of the general public in Iran has been restricted to political elections up until this point and that involving the general public in the conservation and management of cultural heritage is a relatively revolutionary idea for cultural heritage institutions. He stated that there is not only a gap in the system but also a lack of legal policies for people's participation in cultural heritage management. He said:

> *"The policy relating to people's participation, in general, is to vote in political elections at local or national levels. The concept of people's participation in cultural heritage conservation is a new topic, and we are still working on ratifying and adopting a new policy for applying it, based on the Constitution of the Islamic Republic of Iran."*
>
> *Participant 11, August 2021*

Another person questioned how effectively people were involved in managing cultural heritage. She argued that due to the lack of applicable legal regulations, any decision made by the Bisotun World Heritage Site using a participatory approach may be impossible to implement. She mentioned:

> *"If they make a decision in a participatory way, will the national government allow them to implement it?"*
>
> *Participant 10, July 2022*

5.2.2 Usability Evaluations

5.2.2.1 Collection of User Opinion in HCI

Three main issues have been identified in the collection of user opinions, including *complexity*, *performance*, and *unwillingness* to use the new mobile application. For the *complexity* problem, during the design phase, the user interface of the iCommunity application was made as simple and easy to use as possible. At first glance, some features of the iCommunity application gave the impression of being difficult to navigate and understand. In this regard, two distinct features can be distinguished within the interface of the application. Some of the features are comparable to those available on other social platforms, such as Instagram, Facebook, and YouTube, which made it simple for local users to play and get an understanding of them.

In comparison, the other features, which were completely new and designed for the purposes of community participation, were difficult to use and understand in terms of their primary purpose. The strategy consisted of holding a face-to-face meeting with the users and explaining the new features to them. At one of the meetings, there were seven people present, and the designer gave a very brief tutorial together with a catalog in which they debated the core function of the application. After that, users were able to effectively use the application after the functions of each interface had been discussed and clarified. It can be mentioned that the iCommunity application can be presented at any future gatherings with the local people to solve problems they may have.

Despite the widespread use of mobile applications, consumers appear unwilling to constantly download and use new applications for a variety of reasons. To deal with this problem, the Bisotun World Heritage Site gives iCommunity users extra benefits.

Local people who take part in this research agree with the idea that they can visit the site for free if they use the iCommunity app, depending on the amount of time they spend using it.

5.2.2.2 Predictive Evaluation

The goal of this type of method is to make predictions about the performance of interactive systems and error prevention based on the evaluations of experts rather than performing experimental evaluations of the systems themselves (Gena, 2003). The predictive evaluations were carried out in the Department of Computer Science at the University of Turin by thirteen participants, all of whom were pursuing their master's degrees in the field. In order to conduct an assessment of the iCommunity application, we implemented two different methods. In the first step of the process, four participants used the heuristic evaluation method to assess the application. The iCommunity app was then evaluated by nine different evaluators using the mobile application heuristic, a set of rules that were made just for evaluating mobile apps.

5.2.2.2.1 Heuristic Evaluation

Based on the heuristic evaluation, the criticisms and observations made by the evaluators are summarized in this section, along with the possible solutions and general advice that they offered. The user interface of the iCommunity application was improved and changed with the help of possible solutions and general tips.

Four different participants worked together to complete the heuristic evaluation. The evaluations were originally written in Italian, and the author subsequently translated them into English. In general, the more evaluators you have, the more usability issues you will uncover, particularly when the evaluators have different skill sets. However, according to Jakob Nielsen, the optimal number of raters is somewhere between three and five. If you have five people helping you evaluate, you should be able to find up to 75% of any problems (Wong, 2022).

Usability Heuristic 1: Visibility of System Status

Nielsen's first heuristic refers to the fact that the design of our application should keep users informed of what is happening, always offering specific feedback within a

reasonable amount of time confirming that user action on the site has gone successful or not (Nielsen, 1994).

The first heuristic says that our application's design should keep users up to date on what's going on, always give specific feedback within a reasonable amount of time, and let users know if an action they took on the iCommunity application was successful or not. Based on the results of the heuristic evaluation, the prototype application was modified. It was an issue with application orientation; because some headers lacked page names, users were unsure which page they were on. Moreover, the return icon was not clear on some pages. The icons on the home page were also not clear. Table 12 is a summary of the most important changes that came out of the first heuristic evaluation:

Table 12 Usability heuristic 1: visibility of system status; the summary of critics and observations, solutions, and general tips

Usability Heuristic 1 Visibility of System Status	Evaluator	Critics and Observations	Severity	Possible Solution	General Tips
	E1	Orientation in App	4	Showing the location of users in the App	Link to the sites of text
	E2	Icons on the main page	3	Adding the name of icons	Adding the Menu icon on all pages
	E3	Return icon	2	Locating the symbol of Return in right up	Adding explanation on the all images
	E4	Return icon	4	Adding the Menu icon on all pages	Adding the name of all pages

Usability Heuristic 2: Match Between the System and the Real World

According to this heuristic, the design of our application should be easy to use and understand: using a language consonant with that of the users. Not only words but also concepts should be within everyone's reach. Avoid *internal jargon* to the site as the application can be used both by capable users who know the site and by non-expert users. The site, as well as being easy to understand literally and conceptually, must be endowed with a logical order (Nielsen, 1994).

According to this evaluation, our application's layout needs to be intuitive and simple to understand, and its language ought to be consistent with that of the people who will be using it. It is important that not only words but also concepts be accessible

to everyone. It is important to steer clear of adding any internal jargon to the website because the application can be used by users with varying levels of expertise, including those who are not familiar with the application. In addition to being simple to comprehend on both a literal and conceptual level, the iCommunity needs to have a coherent structure that follows a logical progression.

It was an inconsistency on the initial registration page that was fixed by using the sign-in feature's standards. The registration page now includes options for signing in with Google, Twitter, and Facebook accounts. A list of issues that can be monitored in the landscape zone was also added to the monitoring feature. Because there was no log-out function in the setting, the function was added to the interface. Finally, the message icon on the home and menu pages was non-standard, so it was changed. The main modifications of the second heuristic evaluation are summarized in (Table 13).

Table 13 Usability heuristic 2: the match between the system and the real world; the summary of critics and observations, solutions, and general tips

Usability Heuristic 2 Match the System and the Real World	Evaluator	Critics and Observations	Severity	Possible Solution	General Tips
	E1	Sign in page	3	Sign in by username and password, then add the completed profile	Using standard icons
	E2	Monitoring List	2	Adding "or select on the issue" on the monitoring list	Using standard icons
	E3	Log out in setting	4	Appearing log out on all pages	Using standard icons
	E4	Message icon on the home page	4	Message icon Alert	Using standard icons

Usability Heuristic 3: User Control & Freedom

Because it is beneficial to establish a trusting relationship through the application, users must believe that they have complete control over the platform. Users can make mistakes when interacting with the software, so we must always provide a way to go back. This option may direct users to an emergency exit or alert them to potentially irreversible user actions, for example, by way of a pop-up. The exit must be evident and easy to find so that the user can quickly and, above all, calmly avoid damage.

Sign-in and log-out functions were added to the interface as a result of this evaluation. Furthermore, the return icon was too small and was adjusted on all pages. It was impossible to add a pop-up notification when logging out because it is a prototype application, so it must be considered during the programming phase. Furthermore, the first version of the iCommunity lacked a feature for personalizing the application, so it was added to the final version. Table 14 displays the main criticisms and observations, solutions, and general tips for modifications.

Table 14 Usability heuristic 3: user control & freedom; the summary of critics and observations, solutions, and general tips

Usability Heuristic 3 User Control & Freedom	Evaluator	Critics and Observations	Severity	Possible Solution	General Tips
	E1	Sing in page and Log out	4	Adding sing in, sing up, and log out in the menu	Control interaction by the user
	E2	Returning icon	2	More clear returning icon	Control interaction by the user
	E3	Adding notification in Log out in setting	4	Adding pop-up confirmation Sending errors to users	Control interaction by the user
	E4	Personalized setting	4	Changing font & colors by users	Control interaction by the user

Usability Heuristic 4: Consistency and Standards

The application must not be ambiguous in any way to the user, who must understand everything immediately. It must follow all application-specific standards and conventions to avoid misleading the user. As a result, the classic footer was added to all interfaces, and the sign-in page was changed. Table 15 depicts the main criticisms and observations, solutions, and general suggestions for improvements.

Table 15 Usability heuristic 4: consistency and standards; the summary of critics and observations, solutions, and general tips

Usability Heuristic 4 Consistency and Standards	Evaluator	Critics and Observations	Severity	Possible Solution	General Tips
	E1	Using classic footer	4	Adding footer in all pages	Avoiding complicated using
	E2	Using standard in sign in	3	Sign in just by username and password	Avoiding complicated using
	E3	removing Checkbox in sing in and add to complete profile	2	Removing the Checkbox in sing and adding to the complete profile	Avoiding complicated using
	E4	No comment	-	No comment	No comment

Usability Heuristic 5: Error Prevention

The usability heuristic 5 does not cover the prototype application in the first place, but the results aim at the iCommunity modification. Although adding night mode and the pop-up confirmation when logging out is not possible, the registration page has been modified with a standard username and password sign-in to prevent errors. Table 16 shows the main criticisms and observations, solutions, and general suggestions for improvements.

Table 16 Usability heuristic 5: error prevention; the summary of critics and observations, solutions, and general tips

Usability Heuristic 5 Error Prevention	Evaluator	Critics and Observations	Severity	Possible Solution	General Tips
	E1	Log out confirmation	4	Add confirmation pop-up	Guide the user
	E2	Sign in errors Night mode	4	Adding standard for username and password, and personalized feature	No comment
	E3	Message icon on the home page	4	Improving message icon	No comment
	E4	Improving help icon	2	Adding FAQ on the help page	No comment

Usability Heuristic 6: Recognition vs. Recall in User Interfaces

Given the short-term limit of human memory, the application must be designed in such a way that it can be easily retrieved. The interfaces must promote recognition by reducing the user's cognitive effort during the recall phases. As a result, all icons were standardized on the basis of other social platforms. Smooth transitions were used to improve the returning function, and a tutorial guide was added to the home page. Table 17 displays the key criticisms and observations, as well as solutions and general suggestions for improvement.

Table 17 Usability heuristic 6: recognition vs. recall in user interfaces; the summary of critics and observations, solutions, and general tips

Usability Heuristic 6 Recognition vs. Recall in User Interfaces	Evaluator	Critics and Observations	Severity	Possible Solution	General Tips
	E1	Using standard icons	3	Using a simple icon or word	No comment
	E2	Using standard icons, Using a standard of social platform	2	Returning to the previous page	No comment
	E3	Using the help on the home page	4	Using pop-ups on the more information page	No comment
	E4	Returning is not clear	4	Improving return icon	Use familiar icons, smooth transitions, more simple orientation

Usability Heuristic 7: Flexibility and Efficiency of Use

Flexible processes can be created in a variety of ways, allowing users to select the method that best suits their needs. Shortcut speeds up expert users' interaction with the system while also including features for novice users. As a result, the application's structure was changed and simplified, a standard set of icons was used in the settings feature, and a personalized setting was added. The summary of critics and observations, solutions, and general suggestions is shown in Table 18.

Table 18 Usability heuristic 7: flexibility and efficiency of use; the summary of critics and observations, solutions, and general tips

Usability Heuristic 7 Flexibility and Efficiency of Use	Evaluator	Critics and Observations	Severity	Possible Solution	General Tips
	E1	adapt the app to the page or device, and Misleading icons	3 2	Using a more simple structure	Avoiding complicated structure
	E2	Setting icons are not suitable	2	Using the same icon (menu and footer)	Using few icons
	E3	lack of Personalized setting	3	Adding personalized feature	Adding the more personalized setting
	E4	Lack of customized content, and Personalized setting	1 4	Adding a customized and personalized feature	Adding the more personalized setting

Usability Heuristic 8: Aesthetic and Minimalist Design

Based on this assessment, it was deceptive with similar features on the application. For instance, users were confused by *more information* on the menu page, and *add information* on the home page. The structure of the application was reviewed once more for potential changes. In addition, the font size, icons, and other contents have been significantly changed. Table 19 displays the main results of the evaluation.

Table 19 Usability heuristic 8: Aesthetic and minimalist design; the summary of critics and observations, solutions, and general tips

Usability Heuristic 8 Aesthetic and Minimalist Design	Evaluator	Critics and Observations	Severity	Possible Solution	General Tips
	E1	misleading more information and add information features	1	Distinguishing among features	Using different icons
	E2	Modifying the content (ex. font size)	3	Adding personalized feature	No comment
	E3	Size of icons	2	Improving icon design	No comment
	E4	Non-organic structure	2	Organic structure in textual contents	No comment

Usability Heuristic 9: Help Users Recognize, Diagnose, and Recover from Errors

This evaluation helps users recognize, diagnose, and recover from errors. Error messages must be clearly explained (no error codes), indicate the problem, and suggest the solution. Present errors are also in visual form, helping the user to notarize and

recognize them. The heuristic evaluation 9 is not basically implemented in a prototype application. The summary of critics and observations, solutions, and general tips is displayed in Table 20.

Table 20 Usability heuristic 9: Help users recognize, diagnose, and recover from errors; the summary of critics and observations, solutions, and general tips

Usability Heuristic 9 Help Recognize, Diagnose, and Recover from Errors	Evaluator	Critics and Observations	Severity	Possible Solution	General Tips
	E1	Lack of error code	5	Display the status of the platform in case of an error and be able to go back easily	Provide didactic error messages
	E2	Lost on the pages	3	Using a more simple structure	Avoiding complicated structure
	E3	Graphic design	1	Improving design	No comment
	E4	No answer	-	No comment	No comment

Usability Heuristic 10: Help and Documentation

The system should not need any further explanation. However, it can be useful to provide documentation to help users understand how to complete tasks. Aid and documentation must be easily accessible and focused on user actions. Points coincided by means of a list of steps to follow. As a result, a simple catalog to guide users was used (Figure 7 & Figure 8). The summary of heuristic evaluation 10 is shown in Table 21.

Table 21 Usability heuristic 10: help and documentation; the summary of critics and observations, solutions, and general tips

Usability Heuristic 10 Help and Documentation	Evaluator	Critics and Observations	Severity	Possible Solution	General Tips
	E1	Lack of errors solution	4	Adding help center feature	Create a special section of guidelines or contextualized help
	E2	Lack of errors solution	4	Adding help center feature	Create a special section of guidelines or contextualized help
	E3	Lack of guideline	4	Adding FAQ and Help (question/answer)	Improve user satisfaction through specific question-answer sections
	E4	Lack of guideline	4	Adding FAQ and Help (question/answer)	Improve user satisfaction through specific question-answer sections

5.2.2.3 Mobile Application Heuristic

A group of nine master's students evaluated the iCommunity application at the University of Turin's department of computer sciences based on mobile application heuristic. The evaluations were conducted in Italian, and the author translated them into English for the thesis and Persian for the evaluation of the application at the Bisotun World Heritage Research Base. Since smartphone mobile application evaluation is designed for a real mobile application, not a prototyped one, some of the evaluations are unadaptable for the iCommunity prototyped application. Thereby, it was impossible to apply all of the evaluations to the prototyped application. Other applicable evaluations have been applied as follows:

SMART 1: Provide Immediate Notification of Application Status

Based on the SMART 1 mobile application evaluation, the orientation of the application was improved by changing the color of the icons when users are on the given page. Some unclear actions were removed, and others were modified. Table 22 provides the summary of critics and observations, solutions, and applied modifications.

Table 22 SMART 1: provide immediate notification of application status; the summary of critics and observations, solutions, and modifications

	Evaluator	Critics and Observations	Possible Solution	Modification
SMART1 Provide Immediate Notification of Application Status	E1	Orientation in App	Explain the location on the Map	Location page modified
		Return to previous page	Optimizing the top space	Returning icon added
	E2	Home page is not clear	Using unified icon on all pages	The home page modified. Icons unified.
		Lack of notification icon	Add notification icon	A notification icon added
		Message number 4	No comment	Message icon modified
		Status notification	No comment	Adding tutorial for the App
	E3	Lack of users navigation	changing color of the icon	Navigation modified
	E4	The users sign in is not clear	Adding a custom icon in the menu like Instagram	The registration page modified
		Unclear actions	Adding pop-up notification for completed action	Not applicable in prototype
		The shape of message icon	Using small icon for different notification (mail, message, alert, etc.)	The message feature modified
	E5	Showing the name of page that users are in	No comment	Pages' names added to all pages
		Adding Return icon in all pages	No comment	Returning icon added
		Orientation	No comment	All pages modified
	E6	Using changed color of icons when users are in that page	No comment	Icons color modified when users in that page
		Changing the home icon when users are in home page	No comment	Icons color modified when users in home page
	E7	Airplane icon is not clear	Modifying the airplane icon	Not applicable in prototype
	E8	Using pop-up confirmation for each activity	No comment	Not applicable in prototype
	E9	Using changed color of icons when users are in that page	Using changed color of icons when users are on that page	Icons color modified when users in that page
		Changing the home icon when users are in home page	Changing the home icon when users are on home page	Icons color modified when users in home page

SMART 2: Use a Theme and Consistent Terms, as well as Conventions and Standards Familiar to the User

Based on this assessment, comments, a unified style, support for different languages, customization of the theme, message, and *like/dislike* features are the main criticisms of this evaluation. The function of the comments was unclear to the evaluators, so it was modified in accordance with the social platform standards. Support for multiple languages and a customized theme are not possible in the prototype but must be considered during the coding phase. The message function was reviewed and improved once more. Although some reviewers mentioned that the social media app uses *like* features, the *dislike* feature is extremely important in this app. This function remained unchanged because the opinion of opponents of a given future activity is more important than that of supporters of the activity. Table 23 shows the summary of critics and observations, solutions, and applied modifications.

Table 23 SMART 2: use a theme and consistent terms, as well as conventions and standards familiar to the user; the summary of critics and observations, solutions, and modifications

SMART2 Use a Theme and Consistent Terms, as Well as Conventions and Standards Familiar to the User				
	Evaluator	**Critics and Observations**	**Possible Solution**	**Modification**
	E1	Modifying the comments section	Modifying the airplane icon	Comment feature modified
		adding the function that users can share the comments with whoever they want	Adding a function to share users idea with the people outside the App	Not applicable in prototype
	E2	Modifying the icons	Changing the bottom icons	Bottom icons modified
		Bottom icons are not clear	Adding guideline for each icon	Standard icons used
	E3	Lack of unified style in different pages	No comment	Icons style unified
	E4	Using standard icons	No comment	Standard icons used
		Adding different language	No comment	Not applicable in the prototype
		Using Register instead of sign up	No comment	The registration page modified
	E5	Monitoring section is not clear	Adding guideline to monitoring page	Monitoring feature modified
	E6	Sending message icon is not clear (Sending message to whom)	Showing the function of icon when touch it	Searching users added
		No comment	Removing the Ask an expert icon in menu	Users want to have this function on the menu
	E7	Lack of Menu icon in all pages	Modifying the chat and ask an expert icons	Menu icon added on all pages
		Modifying the log in function	No comment	The registration page modified
		Lack of return function in message page	Removing the bottom menu in chat pages	Returning icon added on all pages
		Unifying the icon related to notification (bell, letter, airplane)	Using standard icon	Notification feature modified
		Unifying the icons, size, style, etc.	Using unified style	Icons style unified
		Modifying the voice messages, images from the gallery or photos pages	Adding the voice, image and photos in right of the chat bar	Voice, image, and photos features added
		Lack of return to previous page or/and home page in log in section	Adding return icon in all pages	Returning icon added on all pages
		The Like and dislike icons are obsolete	Modifying the like/dislike icons (using standard icons)	Like and dislike feature modified
	E8	Using customized font and different theme	No comment	Not applicable in prototype
	E9	Adaptable for all smartphones	No comment	Not applicable in prototype
		Adding different languages	No comment	Not applicable in prototype

SMART 3: Prevent Error Where Possible; Assist User Should an Error Occur

According to this assessment, it was different features on the home page and menu page that were unified later on. The home page consists of urgent functions, while the menu page includes all the application features. Besides, it was ambiguity on some pages, the arrangement of images, for instance, was redesigned and modified. A guideline also was added to the home page. The summary of the main criticisms and observations, solutions, and applied modifications is displayed in Table 24.

Table 24 SMART 3: prevent error where possible; assist user should an error occur; the summary of critics and observations, solutions, and modifications

SMART3 Prevent Error Where Possible; Assist User Should an Error Occur	Evaluator	Critics and Observations	Possible Solution	Modification
	E1	Lack of a return icon on some pages	No comment	Returning icon added on all pages
		Limitation in performance	No comment	Not applicable in prototype
	E2	Lack of feedback	Add guideline	Guideline added
		Lack of alternative way to resolve the error	Report errors by users	Not applicable in prototype
		Ambiguity on the home page	Modifying the pages	Home page redesigned and modified
	E3	Lack of some functions on menu	No comment	All functions added to the menu
	E4	Lack of return icon in some pages	No comment	Returning icon added on all pages
	E5	Lack of checkbox on registering page	No comment	The registration page modified
		Lack of example in sign in page	No comment	The registration page modified
	E6	Lack of return icon in some pages	No comment	Returning icon added on all pages
		Ambiguity in some pages	Arrange images in carousel	Home page redesigned and modified
	E7	Impossible to evaluate	No comment	
	E8	Lack of guideline	No comment	Guideline added
	E9	Lack of return icon in some pages	No comment	Returning icon added on all pages

SMART 4: Display an Overlay Pointing Out the Main Features When Appropriate or Requested

The primary criticisms and observations regarding this evaluation are the absence of guidelines and/or a frequently asked questions list (FAQ), a help system, and the

incompleteness of the menu features. Because the iCommunity application is a prototype, adding overlaps, guidelines, and help system features is not possible. However, these critics must be taken into account during the coding process. Other potential changes have been made to the application. Table 25 shows a summary of the assessment results.

Table 25 SMART 4: display an overlay pointing out the main features when appropriate or requested; the summary of critics and observations, solutions, and modifications

SMART4	Evaluator	Critics and Observations	Possible Solution	Modification
Display an overlay pointing out the main features when appropriate or requested	E1	Lack of guideline	Adding tutorial feature	Guideline added
		Lack of FAQ	Adding FAQ and Help (question/answer)	Not applicable in prototype
	E2	Lack of overlaps	Add overlays feature	Not applicable in prototype
		Lack of guideline	Add guideline	Guideline added
	E3	Lack of navigation menu on all pages	Unifying header and footer of all pages	Menu icon added on all pages
		Lack of main functions in menu	Modifying the menu	All functions added to the menu
	E4	Similar to Instagram	No comment	
		Like/unlike like YouTube	No comment	
	E5	Lack of help system	No comment	Not applicable in prototype
	E6	Lack of some feature in menu	Modifying menu bar	All functions added to the menu
	E7	Lack of Menu icon on all pages	Adding Menu icon on all pages	Menu icon added on all pages
	E8	Lack of visual guideline	Adding tutorial feature	Guideline added
	E9	No comment	No comment	No comment

SMART 5: Each Interface Should Focus on One Task

Most evaluators did not comment on the initial prototype interface because each page already focused on a single task. An evaluator pointed out a similarity between the modified message and notification features. Another reviewer criticized the similarity of some icons with different functions on the home and menu pages, so the icons were changed. Table 26 summarizes the results and modifications of SMART 5.

Table 26 SMART 5: each interface should focus on one task; the summary of critics and observations, solutions, and modifications

SMART5 Each Interface Should Focus on One Task	Evaluator	Critics and Observations	Possible Solution	Modification
	E1	No comment	No comment	
	E2	No comment	No comment	
	E3	Similarity between message and notification feature	Dividing message and notification feature	The message feature modified
	E4	The similarity of bottom functions on home page with some features of menu page	Dividing the functions on home page and menu page	Home page redesigned and modified
	E5	No comment	No comment	
	E6	Different way of return	Using unified icon in all pages	Returning icon unified on all pages
	E7	No comment	No comment	
	E8	No comment	No comment	
	E9	No comment	No comment	

SMART 6: Design a Visually Pleasing Interface

A professional graphic designer should redesign the iCommunity application in general. The main issues in creating a visually pleasing interface are color brightness, font size and color, and the use of monotonous colors. The brightness, font size, and colors were changed, but the monotonous pages remained the same. The use of monotonous colors was intended to prevent the colorful interface from deceiving users. Table 27 summarizes the evaluators' points of view on the sixth SMART.

Table 27 SMART 6: design a visually pleasing interface; the summary of critics and observations, solutions, and modifications

SMART6 Design a Visually Pleasing Interface	Evaluator	Critics and Observations	Possible Solution	Modification
	E1	Colors are too bright	Modifying the colors	Colors modified
	E2	Lack of unified style in different pages	Using a unified style on all pages	Page style modified
		Fonts are small	Using bigger fonts	Fonts modified
	E3	Using too much text in some pages	Adding other features	
	E4	Using too much text in some pages	Using keywords	
		Monotonous pages	Using colorful icons	Colors modified
	E5	Monotonous pages	Using colorful icons	Colors modified
	E6	No critics	No comment	
	E7	Monotonous pages	Using colorful icons	Colors modified
	E8	Focus on functionality instead of stylistic	Modifying graphics	
		Monotonous pages	Using colorful icons	Colors modified
	E9	Colors are too bright	Modifying graphics	Colors modified
		Lack of Personalized feature	Adding personalized feature	Personalized feature added

SMART 7: Intuitive Interfaces Facilitate User Navigation

Mobile interfaces should be simple to use, with clear consequences for actions. This allows users to easily complete their tasks. In order to solve the ambiguity in orientation, the consequences of each feature were redesigned as a sequence of actions. Some pages did not include their page name. So, they were added. The *location of the activity*, *add information*, *monitoring*, *menu* page, menu order, *ask for permission*, and *data analysis* features were redesigned and modified. The summary of critics and observations, solutions, and modifications is shown in Table 28.

Table 28 SMART 7: intuitive interfaces facilitate user navigation; the summary of critics and observations, solutions, and modifications

	Evaluator	Critics and Observations	Possible Solution	Modification
SMART7 Intuitive Interfaces Facilitate User Navigation	E1	Ambiguity in some features	Modifying features	
	E2	Ambiguity on the home page	Modifying home page	Home page modified
		Lack of guideline	Adding tutorial	Guideline added
	E3	Unclarity in add information feature	Modifying add information feature	Add information feature modified
	E4	Lack of guideline	Add guideline	Guideline added
		Geographical location is unclear	Modifying geographical location feature	Location feature modified
		Lack of page's name	Adding name pages	Pages' names added
	E5	No comment	No comment	
	E6	Monotonous colors	Using colorful pages	Colors modified
	E7	Lack of expected orders in menu	Modifying menu order	Menu order modified
	E8	Ambiguity in data analysis	Modifying data analysis feature	Not applicable in prototype, data analysis page modified
		Ambiguity in monitoring feature	Modifying monitoring feature	Monitoring feature modified
		Ambiguity in ask for permission	Modifying ask for permission feature	Ask for permission modified
	E9	No comment	Adding tutorial feature	Guideline added

SMART 8: Design a Clear Navigable Path to Task Completion

In their evaluations, participants identified the following ambiguities: ambiguity in adding multimedia, the message feature, user navigation, the adding information feature, the monitoring function, and proposing new activities. User satisfaction and engagement may be negatively impacted as a result of these issues. The platform could benefit from having these issues resolved so that it is more functional and user-friendly. On the interface, we were able to clear up some of these confusions. For instance, the iCommunity application now includes a list of the most common issues that should be taken into consideration when using the monitoring feature. However, some of the

criticisms were not applicable to the prototype. Table 29 provides a summary of criticisms, observations, solutions, and modifications.

Table 29 SMART 8: design a clear navigable path to task completion; the summary of critics and observations, solutions, and modifications

	Evaluator	Critics and Observations	Possible Solution	Modification
SMART8 Design a Clear Navigable Path to Task Completion	E1	Ambiguity in some functions	Adding tutorial feature	Guideline added
		Ambiguity in adding multimedia	Modifying add multimedia feature	Not applicable in prototype
		Ambiguity in the message feature	Modifying message page	Message feature modified
	E2	Lack of feedback	Modifying user feedback	Guideline added
		Ambiguity in user navigation	Display the page's name at the header	Add page names to all pages
	E3	Ambiguity in add information feature	Modifying add information feature	Add information modified
	E4	Ambiguity in monitoring	Modifying monitoring feature	Monitoring list added
	E5	No comment	No comment	
	E6	Ambiguity in propose new activity	Modifying propose new activity feature	Propose new activity modified
	E7	View all comments function is useless	Removing the feature	View all comments removed
		Lack of return in some pages	Adding return icon to all pages	Returning icon added on all pages
		Ambiguity in message function	Modifying message feature	Message feature modified
	E8	Ambiguity in navigation	Modifying features	Navigation modified
	E9	No comment	No comment	

SMART 9: Allow Configuration Options and Shortcuts

According This examination details a number of problems associated with the application, such as the inability to customize its settings, the absence of a personalization feature, the difficulty of exploring new topics, the lack of favorite lists and the addition of content, the lack of a customized notification system, and so on. Because of these issues, users may not feel as though their requirements and preferences

are being met, which can have a negative impact on their level of engagement and satisfaction with the application. Based on this evaluation, possible changes were made to the iCommunity to improve the overall quality of the user experience by giving users more customization options. Table 30 summarizes the criticisms, observations, solutions, and modifications.

Table 30 SMART 9: allow configuration options and shortcuts; the summary of critics and observations, solutions, and modifications

SMART9 Allow Configuration Options and Shortcuts	Evaluator	Critics and Observations	Possible Solution	General Tips
	E1	Lack of customized option	Modifying customized and personalized feature	Adding more personalized setting
	E2	Not applicable in this type	Manage configuration based on different users	Not applicable in prototype
	E3	Allowing customization	Modifying customized and personalized feature	Personalization feature added
	E4	Lack of investigating topics	Modifying configuration	All features added to menu
	E5	Lack of favorite list and add content	Modifying the feature	Not applicable in prototype
	E6	Ambiguity on home page	Modifying configuration	Home page modified
	E7	Lack of customized notification	Modifying notification	Not applicable in prototype
	E8	Lack of personalization feature	Modifying customized and personalized feature	No comment
	E9	Not present	Adding favorite feature	Not applicable in prototype

SMART 10: Satisfy Different Mobile Environments

This evaluation reveals additional issues with the application, including:

- Lack of setting management functionality: users cannot modify their account information, notification preferences, or privacy settings through the application.
- Lack of customizable contrast, color, theme, text, icon, etc.: the application does not give users the option to adjust the contrast, color, theme, text size, or icon size in order to customize the appearance and design of the interface.

- No option to change the application's context: the application cannot change its context to accommodate different languages, regions, or device types.
- Absence of dark mode or black background: the application lacks a dark mode setting or a background color selection option, which could make it easier on the eyes in low lighting.
- Ambiguity in the support feature: users may have trouble finding the information or help they need because the support feature is not clear and easy to use.

Users may feel that their needs and preferences are not being met as a result of these problems, which may further increase their frustration and dissatisfaction with the application. The potential adjustments were made to the iCommunity in order to enhance the overall experience. Table 31 is a summary of the criticisms, observations, solutions, and changes that have been made.

Table 31 SMART 10: satisfy different mobile environments; the summary of critics and observations, solutions, and modifications

SMART10 Satisfy Different Mobile Environments	Evaluator	Critics and Observations	Possible Solution	Modification
	E1	Lack of setting management	Add dark mode e.g.	Not applicable in prototype
		Lack of customized contrast, color, theme, etc.	Adding customized feature	Personalization feature added
	E2	No option to adapt application to different context	Modifying the option	Not applicable in prototype
	E3	Texts are small	Increase the text size	Fonts modified
		No dark mode	Add dark mode	Not applicable in prototype
	E4	Lack of text customization	Add customizing text	No comment
		Lack of dark mode or black background	Add dark mode	Not applicable in prototype
	E5	Lack of customization, text, icon, color, etc.	Add customizing feature	Personalization feature added
		Lack of dark mode	Add dark mode	Not applicable in prototype
	E6	Ambiguity in help center feature	Modifying the feature	Not applicable in prototype
	E7	Ambiguity in setting feature	Modifying the feature	Personalization feature added
	E8	No critics	No comment	
	E9	No comment	Add audio comment	Audio comment added

SMART 11: Facilitate Easier Input

SMART 11 evaluates users based on how quickly and accurately they are able to enter content. In this regard, the participants have identified three primary flaws in the operability of the iCommunity application. To begin, the font and icon sizes were not large enough for their respective spaces. Because of this, the sizes of the text and icons were adjusted. Second, they found serious flaws on the registration page, such as limited space on the registration page, gender and education identification, and the inability to select a birth date. By improving these features, the application will be able to provide a more comprehensive portrait of its users. Third, there was no option to change the appearance of the graphical elements. For instance, the application could provide a selection of predefined color schemes for users to select from, in addition to

allowing users to upload their own graphics. Table 32 is a summary of the problems, observations, solutions, and modifications that came out of this evaluation.

Table 32 SMART 11: facilitate easier input; the summary of critics and observations, solutions, and modifications

	Evaluator	Critics and Observations	Possible Solution	Modification
SMART11 Facilitate Easier Input	E1	The size of texts and icons is small	Increase the texts and icons size	Fonts and icons size modified, personalization feature added
	E2	Not applicable	No comment	
	E3	Small space on registration page	Modifying registration page	Registration page modified
	E4	Some problems on registration page	Modifying registration page	Registration page modified
	E5	Not applicable in prototype	No comment	
	E6	No graphical customization option	Modifying the feature	Not applicable in prototype
	E7	Lack of gender identification on registration page	Modifying registration page	Registration page modified
	E8	Not applicable in prototype	No comment	
	E9	Lack of education identification on registration page	Modifying registration page	Registration page modified

SMART 12: Use the Camera, Microphone, and Sensors When Appropriate to Reduce User Workload

Based on this evaluation, using the camera, microphone, and sensors in a smart way can significantly reduce the user's workload, making the app more user-friendly and efficient. Evaluators recognized four main issues regarding this parameter. Many messaging apps only provide users with the option to type out their messages without incorporating voice-to-text or voice recording features. This can be particularly challenging for users who prefer to communicate through voice messages or those who find it difficult to type quickly on their mobile device. Incorporating microphone functionality into messaging features can help alleviate this problem and provide users with more options for communication. Similar to message feature, some apps only let users type out comments and don't let them record audio. By adding microphones to

comment sections, apps can give users more options and make it easier for them to leave feedback or comments.

Another issue is the ineffective use of the camera in the iCommunity application. Some mobile applications do not make the best use of camera functionality. For example, they may not allow users to scan QR codes or use image recognition, which can significantly reduce user workload. By utilizing camera features such as OCR (Optical Character Recognition) barcode scanning, apps can help users input information quickly and accurately and save them from having to manually enter data. Also, the iCommunity app doesn't make it clear or easy to send media like photos or videos. This can lead to frustration or errors when users try to send files. Providing clear instructions or using intuitive design patterns, such as drag-and-drop functionality, can help mitigate this problem and make it easier for users to send media through the app. Table 33 is a summary of the problems, observations, solutions, and modifications.

Table 33 SAMRT 12: use the camera, microphone, and sensors when appropriate to reduce user workload; the summary of critics and observations, solutions, and modifications

SAMRT12 Use the Camera, Microphone, and Sensors When Appropriate to Reduce User Workload	Evaluator	Critics and Observations	Possible Solution	Modification
	E1	Lack of using microphone on message feature	Add microphone on message feature	Audio comment added
		Lack of using camera efficiently	Add camera on message feature	Message feature modified
	E2	Lack of using microphone on comment feature	Modifying comment feature	Audio comment added
	E3	No critics	No comment	
	E4	No critics	No comment	
	E5	Not applicable in prototype	No comment	
	E6	Icon for posting images is small	Increase the icon size	Icons size modified
	E7	Ambiguity in sending media on message page	Modifying message page	Message page modified
	E8	No critics	No comment	
	E9	No critics	No comment	

SMART 13: Create an Aesthetic and Identifiable Icon

An icon for a mobile application should be aesthetic and identifiable as this is what a user sees when they search the device interface for the application they want to launch, and when searching through the app stores it will be the first item they will see. before the application title, description, and screenshots. The results of this evaluation are summarized in Table 34.

Table 34 SMART 13: create an aesthetic and identifiable icon; the summary of critics and observations, solutions, and modifications

SMART13 Create an Aesthetic and Identifiable Icon	Evaluator	Critics and Observations	Possible Solution	Modification
	E1	Not applicable	No comment	
	E2	Not applicable	No comment	
	E3	No comment	No comment	
	E4	Ambiguity in logo	Graphical modification	Logo modified
	E5	Lack of recognizable icon	Graphical modification	Standard icons replaced
	E6	Ambiguity in monitoring	Graphical modification	Monitoring list added
	E7	Not applicable	No comment	
	E8	Lack of recognizable icon	Graphical modification	Standard icons replaced
	E9	Not applicable	No comment	

5.3 Summary

Chapter 4 is all about evaluations, the results of the data that was collected, and how the data was analyzed based on interviews and HCI methods. It talks about the iCommunity model and the participatory design process that was used to develop the app. The iCommunity model is a set of ideas that show how important it is for the community to be involved in designing and implementing technological solutions. This model was used to guide the development of the iCommunity prototype application.

During the participatory design process, users were observed at the Bisotun World Heritage Site. Scenario-based design, design and presentation of ideal situations, design of the prototype and initial test, modification of the prototype, presentation of the prototype to the users, experimentation with the users, changes to the prototype, and presentation to the users were also part of the process. Thematic analysis was used to analyze the data collected during the participatory design process. This analysis involved socio-demographic characteristics, initial codes, grouping of initial codes to form themes, and emergent themes.

The results of the thematic analysis showed that there were five themes related to community-based participation: misunderstanding, irregularity, exclusivity, unwillingness, and power hierarchy. These themes show how hard it is to get people in a community involved in designing and implementing technological solutions. Finally, usability evaluations were also conducted to assess the usability of the iCommunity prototype application. User opinions were collected through human-computer interaction (HCI) and predictive evaluation, which included heuristic evaluation and mobile application heuristics.

In the next chapter, Discussion and Conclusion, the key findings from Chapter 4 will be discussed and explained in detail. In the discussion section, we'll talk about the study's flaws, such as any problems or restrictions that came up during the participatory design process. In addition, it will identify research gaps and suggest potential avenues for future investigation. The Conclusion section will summarize the key findings and contributions of the study and provide a final reflection on the research question and objectives.

6 Chapter Six: Discussions and Recommendations

6.1 Discussions

The research was conducted with respect to the research questions, considering the fact that public participation is a key to sustainable cultural heritage conservation, how can we develop a mobile application that can be used as a tool to facilitate the interactions between cultural heritage institutions and local people in the protection of cultural heritage sites?

How can a participatory approach to cultural heritage conservation and management be applied, given that public engagement is critical to the long-term preservation of cultural heritage?

Community-based participation in the preservation of cultural heritage is a difficult and complex process. This is especially true at large sites like the Bisotun World Heritage Site, which has a lot of cultural heritage monuments and sites spread out over a large area. Based on this research, some of the biggest problems that the Bisotun World Heritage Site may face when trying to get people from the community to take part are:

6.1.1 Lack of Awareness and Interest

Lack of awareness and interest can be a significant challenge for community-based participation at the Bisotun World Heritage Site. It means that the people in the area might not know enough about the importance of cultural heritage sites and how important it is to keep them around. Also, they may not be interested in community-based activities because they don't have enough motivation or incentives to do so. One reason for this challenge may be the limited educational and awareness programs that are available to local people. Many schools don’t teach enough about cultural heritage sites and what they mean, and there may not be enough programs to teach the wider community. So, people might not fully understand how important it is to protect cultural heritage and might not be interested in doing things related to it.

There may also be a lack of incentives and rewards for community-based participation, which could make people less aware and interested. People in the area may not see any direct benefits from their work to preserve cultural heritage. For example, if they are asked to help with monitoring or conservation, they might not see any results from their work. Therefore, they may not be motivated to participate. Also, the fact that local people aren't represented or involved in decision-making processes may be another reason why people aren't aware or interested. Local people might not feel like they are part of the decision-making process or that they are valued, which could make them feel disconnected from cultural heritage sites. This can make people not want to take part in cultural heritage activities in their communities.

To solve this problem, it's important to give people in the area more opportunities to learn and become aware. This can include programs in schools, efforts to reach out to the community, and workshops on how important it is to keep cultural heritage alive. The iCommunity app can also encourage people to take part in community-based cultural heritage activities by giving them rewards and other incentives. It is also important to include people from the area when making decisions about cultural heritage sites. This can help people feel like they own and are a part of efforts to preserve cultural heritage, which can raise awareness of and interest in community-based participation. By addressing the problem of people not knowing about or caring about cultural heritage sites, community-based participation can be increased. This will help cultural heritage sites be better preserved and managed.

6.1.2 Limited Resources

Limited resources can be a major challenge for community-based participation in the conservation of heritage sites like the Bisotun World Heritage Site. This limitation can manifest in different ways. For instance, limited financial resources can affect the extent to which the local community can contribute to conservation efforts. Conservation activities often require funding for equipment, materials, and professional expertise. If the community lacks the resources to fund these activities, it may lead to a lack of meaningful participation. In addition to limited financial resources, limited human resources can also be a challenge. A lack of trained personnel, such as conservation experts or heritage site managers, can hinder the community's ability to effectively participate in the conservation of the site.

The fact that heritage sites frequently require a wide range of skills and expertise, including technical expertise for site management and maintenance as well as archaeological research and historical documentation, can make this limitation worse. If the community does not have the necessary human resources, it can become challenging to implement conservation programs and manage the site effectively. Also, the community may not be able to help protect the site because they don't have the right technology. For example, having access to modern technology like smartphones and the internet can help the community get information and talk to each other better. But if the community doesn't have these things, it can make it harder for them to participate in a meaningful way. For some conservation activities, like collecting and analyzing data or making a map of a site, technology may also be needed. If the community doesn't have access to the right technology, they might not be able to help as much as they could.

Overall, the fact that there aren't enough resources can make it hard for people to work together to protect heritage sites like the Bisotun World Heritage Site. To deal with this problem, it might be necessary to form partnerships with outside groups or government agencies that can provide the resources needed. It may also be necessary to find new and creative ways to help the community make up for its lack of resources. For example, the community could use traditional knowledge and practices or volunteer labor.

6.1.3 Hierarchy of Power

In Iran, as in many other countries, there is a hierarchy of power and decision-making processes that can limit community participation in conservation efforts at sites such as the Bisotun World Heritage Site. This hierarchy may be reflected in the political and administrative structures of the country as well as in the cultural and social norms that influence how people interact with each other. Government officials or other people who don't have to answer to local communities frequently make decisions about conservation efforts and resource distribution at the political and administrative level. This makes it harder for people in the community to take part in making decisions and have their voices heard as conservation policies and practices are made.

Also, Iran's cultural and social norms reinforce the way that certain groups' views and interests are given more weight than others. For example, traditional gender roles may make it hard for women to take part in conservation efforts, and social and economic inequality may make it hard for low-income or marginalized communities to have their needs and points of view taken into account during decision-making. Overall, the hierarchy of power in Iran can create barriers to community participation in conservation efforts at the Bisotun World Heritage Site and other sites like it. To solve these problems, people may need to work on building the skills of local communities so they can take part in conservation activities and speak up for their own interests. They may also need to work on promoting more fair decision-making processes that put the needs and perspectives of all stakeholders first.

6.1.4 Power Dynamics

Power dynamics refer to the relationships between different groups and individuals and the ways in which power and influence are distributed between them. In the context of community-based participation at the Bisotun World Heritage Site, power dynamics can create challenges for effective community involvement. One challenge is that the Bisotun World Heritage Site basically has more power and resources than local communities. This power imbalance leads to unequal partnerships and limited community involvement in decision-making processes. For example, the Bisotun World Heritage Site may have more resources to conduct research or conservation activities, which can make it difficult for local communities to effectively participate in those activities.

Power dynamics can also make it hard for the Bisotun World Heritage Site and local people to trust each other. Local communities may think that the Bisotun World Heritage Site is making decisions for them without taking their needs and points of view into account. This can lead to resistance or apathy towards conservation efforts and community-based participation. Another issue related to power dynamics is the unequal distribution of benefits and costs. Conservation activities may bring benefits such as increased tourism revenue, job opportunities, and cultural preservation. However, these benefits may not be distributed equally among all members of the community, particularly those who are marginalized or have less power. Similarly,

conservation activities may have costs, such as restrictions on land use or changes in traditional practices, which may disproportionately affect certain groups.

Addressing power dynamics requires acknowledging the unequal distribution of power and resources and working to create more equitable partnerships between the Bisotun World Heritage Site and local communities. This can involve actively seeking out and incorporating community perspectives and knowledge, providing training and support to community members, and sharing the benefits and costs of conservation activities more equally. By doing so, community-based participation can become more effective and sustainable.

6.1.5 Lack of Trust

Another problem that can make it hard for people to work together at the Bisotun World Heritage Site is a lack of trust. This lack of trust exists between the local community and the Bisotun World Heritage Site, as well as between different groups in the local community. One reason for this lack of trust is previous negative experiences or misunderstandings between the Bisotun World Heritage Site and the local community. For example, if the local community feels that their opinions and concerns were not taken seriously in the past, they may be less likely to participate in future conservation efforts.

Another reason people don’t trust is that they think the decision-making process isn't open and accountable. If local communities feel that decisions are being made without their input or that the decision-making process is not transparent, they may be less likely to participate. Furthermore, conflicts of interest also lead to a lack of trust in community-based participation. For instance, some members of the community have a vested interest in a specific outcome, such as the development of a particular area, which may conflict with the goals of the Bisotun World Heritage Site.

In order to deal with these problems and build trust, it is important for the Bisotun World Heritage Site to talk with the local community in an open and honest way. This can include regular meetings, information sharing, and providing opportunities for feedback and input. Getting community members involved in decision-making and giving them training and resources can also help build trust and make community-based participation work better. By giving local people more power, the Bisotun World

Heritage Site can give them a sense of ownership and make them more invested in conservation efforts, which will lead to better results.

6.1.6 Privacy

While the iCommunity mobile application has the potential to be a powerful tool for community participation in the conservation of the Bisotun World Heritage Site in Iran, it is important to consider the privacy implications of its use. In the wake of recent events, it is more important than ever to prioritize privacy and security in the design and implementation of mobile applications and to ensure that users are able to participate in community activities without fear of surveillance or persecution.

But using the iCommunity app also makes me worry about my privacy and safety, especially in light of what happened in Iran recently. There is a chance that the government will intercept or monitor the data shared through the app, putting users at risk of surveillance or punishment. Moreover, there is a risk that the application could be used to gather information about users, including their location, activities, and opinions, which could be used for nefarious purposes.

To address these worries, it is important for the designers and developers of the iCommunity app to put privacy and security at the top of their list when making the app. This could mean using encryption and other security measures to protect user data, as well as strong privacy policies and user controls to make sure that users have control over their own data and how it is used.

6.2 Planning in People Participation

There are different approaches to public participation, which started with Arnstein's Ladder of Citizen Participation (Arnstein, 1969). The ladder of participation defines the differentiation between participation and involvement. According to Arnstein, there are different levels of participation, ranging from manipulation to citizen control. This model casts doubt on whether each stage of public participation (for example, informing) can be considered a form of participation in and of itself. Later on, the ladder was transformed into the wheel of participation by the South Lanarkshire Council and Scott Davidson in 1998 (Davidson, 1998). Then it was developed and adapted for different sciences and fields.

It must not be forgotten that the wheel of participation is not a selective plan. The wheel of participation proposes a master planning system that must be applied as a whole and is based on information, consultation, participation, and empowerment. This approach minimizes the problems of the ladder by providing a responsive approach to achieving clear objectives without needing to climb to the top of the ladder. The entire process of public participation is depending on building trust and capacity, which are both long-term projects (Figure 21).

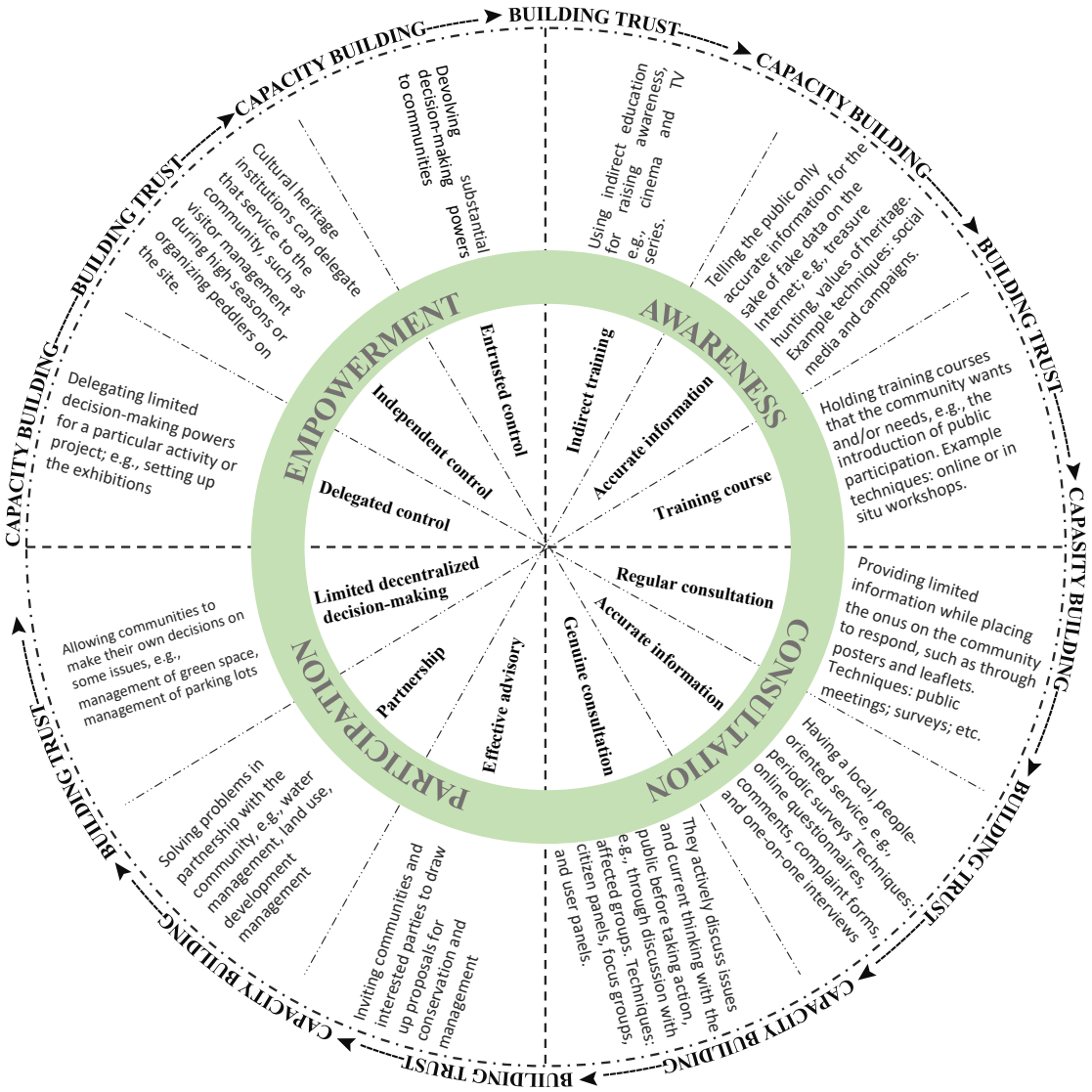


Figure 21 Adopted wheel of participation for cultural heritage management, based on the South Lanarkshire Council model (Davidson, 1998)

In the context of public awareness, indirect training could refer to a form of public education or communication that seeks to indirectly influence people's attitudes, beliefs, or behaviors. This could involve providing accurate information or experiences that indirectly impact people's perceptions or understanding of cultural heritage

conservation and management rather than directly instructing them on what to think or do. It can be an effective approach for cultural heritage conservation, as it can help foster a deeper understanding of and appreciation for heritage sites and artifacts. For example, a cultural heritage institution might use an indirect training approach by hosting an educational event that showcases the value of local cultural resources rather than explicitly telling attendees what actions to take to protect those resources.

Some examples of indirect education in cultural heritage conservation and management are as follows:

- Storytelling: sharing stories about the history and significance of cultural heritage sites and artifacts can help to create a connection between people and these places or objects. By weaving in details about the culture and values of the people who created or used the heritage sites, storytellers can help to convey a deeper sense of meaning and importance.
- Artistic expression: creative works like paintings, sculptures, or music can be used to indirectly educate people about cultural heritage. By incorporating themes or motifs from cultural heritage sites or artifacts, artists can help to create a sense of connection and appreciation for these important pieces of history.
- Interactive experiences: providing hands-on or interactive experiences can be an effective way to indirectly educate people about cultural heritage. For example, a museum exhibit might allow visitors to touch or handle replicas of artifacts, which can help convey a sense of the materials, textures, and craftsmanship involved in creating the original pieces.

Indirect education approaches like these can be effective because they engage people on an emotional or experiential level rather than simply presenting information or facts. By creating a deeper sense of connection and appreciation, these approaches can help inspire people to take action to protect and preserve cultural heritage sites and artifacts.

Consultation is an important aspect of engaging people in cultural heritage management. It can help to ensure that the perspectives and needs of the local community are taken into account when making decisions about the management of cultural heritage sites and artifacts. The following are a few crucial factors to take into

account for effective public participation in cultural heritage management and consultation:

- Timing: consultation should occur early enough in the process to allow for meaningful input but not so early that it is unclear what the specific issues or decisions are that need to be discussed. It's also important to provide sufficient notice and time for people to prepare and participate.
- Accessibility: consultation should be accessible to all members of the community, including those with limited English proficiency, disabilities, or other barriers to participation. Making sure everyone can take part can be helped by offering translation services, sign language interpretation, or other accommodations as needed.
- Engagement: consultation should be designed to engage people in meaningful discussion rather than simply presenting information or gathering feedback. Giving people a chance to talk, ask questions, and give feedback can help them feel like they own the project and support it.
- Follow-up: it is important to provide feedback to the community about how their input was incorporated into the decision-making process and to follow up with any actions or decisions that were made. This can help build trust and accountability and encourage ongoing engagement and participation.

Overall, consultation can be a powerful tool for engaging people in cultural heritage management. By involving the community in decision-making processes and building relationships based on trust and mutual respect, consultation can help to ensure that cultural heritage sites and artifacts are managed in a way that is respectful and responsive to the needs and perspectives of the people who care about them.

Participation is a critical component of people's participation in cultural heritage management. It involves actively involving individuals and communities in the planning, implementation, and evaluation of cultural heritage management initiatives. Here are a few key considerations for effective participation in cultural heritage management:

- Inclusivity: participation should be open and inclusive, with opportunities for a broad range of people to contribute. This could mean getting rid of

language barriers, making accommodations for people with disabilities, and creating safe spaces for groups that aren't as popular or well-known.

- Empowerment: participation should involve empowering individuals and communities to take an active role in decision-making rather than simply providing input or feedback. This may involve providing training or capacity-building opportunities and sharing decision-making power and responsibilities.
- Collaboration: participation should be collaborative and involve working together with communities to develop shared goals and objectives. This could mean building trust and relationships over time and looking for different points of view and expertise.
- Transparency: participation should be transparent and involve sharing information openly and honestly. This may involve providing clear explanations of decision-making processes and sharing data and other information related to cultural heritage management.
- Generally, effective participation in cultural heritage management aims to build more sustainable and equitable approaches to cultural heritage conservation and management. We can help make sure that cultural heritage is valued, protected, and celebrated for generations to come if we include communities in decision-making and give them the power to take an active role in managing cultural heritage.
- Empowerment is another critical aspect of people's participation in cultural heritage management. It involves enabling individuals and communities to take an active role in decision-making and to have a say in the management of cultural heritage sites and artifacts. Key factors to keep in mind when giving people agency over cultural heritage include the following:
- Capacity-building: empowerment involves building the capacity of individuals and communities to take an active role in cultural heritage management. This could mean teaching people how to protect and manage cultural heritage as well as how to be leaders and get things done.
- Shared decision-making: empowerment involves sharing decision-making power and responsibilities with individuals and communities. This may involve establishing collaborative decision-making processes that involve a

range of stakeholders and providing opportunities for communities to set their own goals and priorities.

- Advocacy and representation: empowerment involves advocating for the needs and perspectives of communities and individuals and ensuring that they are represented in decision-making processes. This could mean forming partnerships with community-based organizations and people who want to protect cultural heritage and giving support to grassroots efforts to do so.
- Access to resources: empowerment involves ensuring that individuals and communities have access to the resources they need to participate in cultural heritage management. This could mean giving money and other resources to community-based cultural heritage projects and giving people access to the tools and equipment they need to preserve and manage cultural heritage.

Therefore, empowerment is essential for effective public participation in cultural heritage management. By building the capacity of individuals and communities, sharing decision-making power and responsibilities, and advocating for their needs and perspectives, we can create more sustainable and equitable approaches to cultural heritage conservation and management.

6.2.1 Building Trust

Building trust and capacity building are the two main pillars on which the wheel of participation is based. Building trust is an important factor in fostering people's participation in cultural heritage conservation and management. Trust is essential to ensuring that people are motivated to participate, are engaged in the process, and are willing to work together towards a common goal. Some key approaches to building trust for people's participation in cultural heritage conservation and management are:

- Open Communication: effective communication is essential to building trust between stakeholders. Open communication can help to ensure that everyone is informed about the decision-making process, the progress of the project, and the potential impacts of conservation and management strategies. Communication should be open, clear, and respectful, with the goal of encouraging dialogue and collaboration.

- Inclusion and Diversity: creating an inclusive and diverse environment can help build trust among different groups of people. Involving people from different backgrounds, cultures, and points of view can help create a sense of ownership and empowerment and make sure that everyone's voice is heard and respected.
- Transparency and Accountability: being transparent and accountable in decision-making processes is key to building trust. This can involve sharing information about the conservation and management strategies, the expected outcomes, and the potential risks and benefits. Accountability can be shown through regular reporting, monitoring, and evaluation, as well as feedback and problem-solving systems.

Thus, building trust in people's participation in cultural heritage conservation and management is essential to ensuring that everyone is engaged and committed to the process. Stakeholders can work together to reach common goals and protect cultural heritage for future generations by promoting open communication, inclusion and diversity, transparency and accountability, and capacity building.

6.2.2 Capacity Building

Capacity building involves equipping individuals and communities with the necessary knowledge, skills, and resources to effectively contribute to the preservation, protection, and management of cultural heritage sites and resources. This can include a range of activities, such as training programs, workshops, community engagement, and educational initiatives. Some important ways to make it easier for people to take part in preserving and managing cultural heritage are:

- Education and awareness-raising: educational programs can help individuals and communities better understand the value of cultural heritage and the importance of its preservation. Bringing attention to cultural heritage also helps people feel like they own it and are responsible for keeping it safe.
- Training and Skills Development: developing practical skills in conservation and management techniques can help individuals become effective stewards of cultural heritage. Training programs can give people

hands-on experience and information about the best ways to protect and manage resources.

- Community Engagement: engaging with local communities is essential for successful heritage conservation. This can involve developing relationships with local stakeholders, encouraging their participation and consultation, and incorporating their perspectives into decision-making processes.
- Collaborative partnerships: bringing together different groups and organizations, like government agencies, non-governmental organizations (NGOs), academic institutions, and local communities, can help protect and manage cultural heritage in the best way possible.

6.3 Limitations of the Research

This research like any research, has some limitations. One is that the study was only done with a small group of local people who were willing to use the iCommunity app. So, the results might not be useful in other places or communities where mobile apps are not very popular.

Another limitation is related to the representativeness of the sample. The study was conducted with a convenience sample of residents who volunteered to participate in the study, which may introduce a bias in the sample. The participants who were willing to use the iCommunity app and participate in the study may have different characteristics and motivations than those who did not participate, which may affect the generalizability of the findings. Also, the study was based on what the participants said about themselves, which could lead to response bias. Participants may have given answers that were socially acceptable or may not have accurately remembered what they did with the iCommunity app, which could make the results less reliable. Lastly, the study didn’t have a control group or a comparison group, so it's hard to say how well the iCommunity app works to get people involved at the Bisotun World Heritage Site. A randomized controlled trial or a quasi-experimental design with a control group would be better proof that the iCommunity app works to get people involved in their communities.

7 Chapter Seven: Conclusions

In this study, the central focus was on understanding and addressing the challenges of community-based participation in the preservation of cultural heritage, particularly at the expansive Bisotun World Heritage Site. The goal was to develop effective strategies that bridge the gap between cultural heritage institutions and local communities, ensuring their active engagement and collaboration. Through a comprehensive analysis of various factors affecting community participation, this research aimed to contribute to the enhancement of sustainable cultural heritage conservation and management practices.

The exploration began by acknowledging the significance of public participation as a key element in ensuring the sustainable preservation of cultural heritage sites. The fundamental research questions revolved around devising methods to facilitate interactions between cultural heritage institutions and local communities, thereby fostering a participatory approach to cultural heritage conservation. The study recognized that effective community-based participation involves transcending barriers and addressing multifaceted challenges to ensure a holistic and inclusive approach.

One of the prominent challenges discussed in this study is the lack of awareness and interest among local communities regarding cultural heritage sites. This issue not only reflects a lack of education but also a dearth of incentives and rewards to motivate participation. Additionally, a deficiency of resources, both financial and human, was identified as a major hurdle. The complexity of conservation activities coupled with the requirement for diverse skill sets amplifies this challenge, highlighting the need for collaborative partnerships and innovative resource mobilization strategies.

The hierarchical distribution of power and decision-making in Iran was identified as a further barrier to effective community participation. Cultural and social norms that prioritize certain perspectives over others can hinder the inclusion of marginalized groups. This underscores the importance of empowering communities and amplifying their voices to foster more equitable participation.

Power dynamics and a lack of trust emerged as interrelated obstacles. Imbalances in resources and influence can lead to unequal partnerships and resistance, impeding effective community engagement. The challenge of privacy was also recognized,

especially in the context of technological solutions like the iCommunity app, which requires careful consideration to avoid potential surveillance risks.

The research provided insights into various approaches for addressing these challenges. To mitigate the lack of awareness and interest, comprehensive educational programs, community outreach initiatives, and incentivization through the iCommunity app were suggested. Tackling resource limitations necessitated partnerships and creative solutions, while addressing the hierarchy of power required capacity-building efforts and inclusive decision-making processes. Strategies for building trust encompass open communication, transparency, and accountability. Empowerment strategies included capacity-building, shared decision-making, advocacy, and providing access to resources.

The study also highlighted the need for continuous evaluation and improvement. Recognizing the limitations of a small-scale study, the research emphasized the importance of long-term impact assessments, comparative analyses, and expansion to different contexts. The potential of technology as an enabler for community participation was acknowledged, suggesting avenues for future exploration.

This study advances our understanding of the complex landscape of community-based participation in cultural heritage conservation and management. By shedding light on the challenges and proposing strategies for overcoming them, this research contributes to the development of sustainable frameworks that prioritize inclusivity, collaboration, and shared ownership. The journey towards effective cultural heritage preservation requires the ongoing dedication of stakeholders, the incorporation of diverse perspectives, and the continual pursuit of innovative approaches. Through these efforts, the goal of preserving cultural heritage for future generations can be achieved while fostering stronger and more meaningful connections between cultural heritage sites and the communities that cherish them.

7.1 Future Work

Using the iCommunity mobile app, as a tool for developing a framework for community engagement, the research at the Bisotun World Heritage Site builds a foundation for future work in this area. Here are some potential directions for future research:

- Long-term impact: the current study focused on the short-term impact of the iCommunity app on community participation. In the future, researchers could look into the long-term effects of the app on community involvement and the preservation of historic sites.
- Comparative analysis: as mentioned earlier, the current study did not include a comparison group. Future research could compare the effectiveness of the iCommunity app with other tools or methods for promoting community participation in heritage site conservation.
- Use of technology: the iCommunity app is just one example of how technology can be used to promote community participation in heritage site conservation. In the future, researchers could look into other technologies or platforms that can be used to get people involved and help protect heritage.
- Perceptions of the community: the current study looked at how the iCommunity app affected community participation, but it didn't look at how the community saw the app or why they used it. Future research could look into these things to learn more about how technology can be used to get people involved in preserving heritage sites.
- Expansion of the study: the current study was done with a small group of people who live near the Bisotun World Heritage Site. In the future, the study could be expanded to look at how well the results apply to other communities and historic sites.

It is obvious that more research needs to be done on how technology can be used to encourage people to help protect heritage sites. The iCommunity app is just one example of how technology can be used to get people involved in their communities. Future research can help find the best tools and methods for getting people involved in their communities and protecting their heritage.

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