

# DIGITAL STORYTELLING IN MUSEUMS TO REVIVE ISLAMIC HERITAGE IN THE DIGITAL MUSEUM: A DESIGN PROPOSAL

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## ABSTRACT

A digital museum is a museum exhibition platform that uses computer and information technology to conserve and present cultural treasures and historical collections in digital format. Today, new technologies and tools are being utilised in museums to enhance visitors' experience. Virtual 3D reconstructions of destroyed or disappeared cultural heritage enable viewers to effectively travel back through time and visualise monuments that cannot be physically seen anymore. A powerful way to convey information through three-dimensional geometry is to add interactive digital storytelling to virtual models, as storytelling has long been recognised as an important approach to attracting and pleasing the audience of museums. In this paper, we present a proposal for designing an interactive Islamic heritage digital museum using digital storytelling to revive the Islamic golden age in an immersive digital-physical experience enabling visitors to travel through time to an era that does not exist anymore. This paper explains the process of transforming literature review about Islamic heritage and the life of Muslim scholars during the Islamic golden ages into an interactive digital story that enable visitors to travel through time and immerse them in an interactive experience.

*Keywords: storytelling, digital, museums, Islamic, interactive, experience.*

## 1 INTRODUCTION

Design is a wide world on which a lot of fields depend on it, such as business, management, education, and others, where design tools are used in these areas to achieve a specific purpose, often with the aim of ensuring the quality of the design in proportion to the users [1]. One such tool is digital storytelling. Digital storytelling is simply that old work of storytelling but using digital media, perhaps introducing elements of image, audio, video, text interaction, or more traditional narration. It is used extensively by cultural heritage institutions to attract, engage, and inspire audiences [2]. Storytelling is used throughout the design process, especially the one that focused on user experience design to ensure that all efforts are focused on users' needs [3]. Accordingly, this literature will focus on the importance of using digital storytelling as a key factor in museums because of its role in attracting visitors and influencing the way they interact, communicate with the exhibits in museums.

## 2 WHAT IS STORYTELLING?

There is a difference between story, storytelling and digital storytelling. We use those terms without distinguishing between them, but many scholars have distinguished between the two terms like Polkinghorne [4] and Mahoney [5]. Mahoney states that story depends on the plot, as the plot is the basic structure of the story and not the people, as the stories depend on a cultural and social stock. Consequently, the vivid description of ideas, beliefs, personal experiences, and life lessons via stories or narratives that provoke powerful emotions and insights is referred to as storytelling [5]. Mahoney further discusses that while the storytelling is the sequence of events in the order in which they occurred to prove a certain point [5], he also discusses that storytelling contains characters, whether they are human or like humans in their characteristics or perceptions. Storytelling also aims to clarify cause-and-effect relationships through events. Storytelling is used as a communication method to value,



communicate, and profit on individual expertise. On the other hand, digital storytelling is a dynamic and attractive combination of narration and technology that has been shown to be a powerful edutainment tool. In recent years, there has been a boom in interest in the various applications of digital storytelling, where a growing body of literature has examined how digital storytelling is employed in a variety of disciplines, including entertainment, culture, and education. It can be used in kindergarten through higher education, as well as museums [6].

### 3 HOW DOES STORYTELLING WORK WITH DESIGN?

Storytelling is used throughout the design process, especially the one that focused on user experience design to ensure that all efforts are focused on users' needs and the value the designer wants to provide them where the designer uses his insights to tell a story about who is the users and what they need after completing the design research to understand their requirements and desires [3]. This method (storytelling) will allow users to be understood and each project participant will empathize with the users and verify that their work matches the narrative. Since the designer tells a story throughout production, marketing it, in conclusion, is simply because he already knows what story to tell to show how the product works [3].

### 4 HOW DOES STORYTELLING WORK IN MUSEUMS?

According to Springer, digital storytelling allows many components of conventional storytelling to be merged while also catering to diverse learning styles. Springer [7] pointed out that interactive digital storytelling, which integrates participation as in computer games, with automatic tale development and narration, has grown in two primary directions: plot-based and character-based methods [8]. Plot-based approaches, like more traditional storytelling media, are primarily concerned with the narrative framework [9]. The storyline is frequently generated by real-time interaction between virtual autonomous entities and the user in character-based techniques [10].

### 5 IMPORTANCE OF STORYTELLING IN MUSEUMS

Humans have always been compelled to share and hear stories [11]. Humans usually felt the need of exchanging knowledge, sharing information's, and hearing stories, for example, Prehistoric paintings depicting wonderful hunts and tribal meetings around the fire to relate hunter and hero acts, on the other hand, going to the movies in the theatre, reading books, watching TV, and sharing stories on social media are all examples of these habits that are still practiced today [12]. As a consequence, storytelling is vital for us because it allows us to understand, recall, and share human knowledge, and it also plays a critical part in the lives of individuals and societies by eliciting emotions, motivating, and developing them [13]. As a result, the narration is a crucial tool for museums, as it allows visitors to relive historical experiences while also contributing to the definition of a society's common feeling, which they live in and integrate [14].

### 6 DIGITAL STORYTELLING AS A COMMUNICATION AND INTERACTIVE TOOL IN MUSEUMS

Digital storytelling enables varied audiences, such as the disabled and students of all ages, as well as the general public, to access and interact with large numbers of objects scattered over several zones in an entertaining and educational manner [15]. However, museums are currently experiencing a visitor attendance crisis: visitors have more competitive options for their leisure activities than ever before, and they also expect to learn while having fun [16],



because it is genuinely instructional while combining fun and factual soundness, digital storytelling can successfully build the relationship between the two concepts. So, effective storytelling not only relates to events but is also a memorable performance that allows viewers to experience a range of emotions. On the other hand, storytelling allows a museum to evaluate the authenticity of stories while also improving external communication with target audiences [11]. It's even conceivable to think of storytelling as "the tool" for clarifying museological considerations of change and development: Storytelling is one of the most crucial instruments for establishing meaning and it can ensure that visitors and artifacts are actively connected. However, storytelling is not limited to guided tours; it occurs constantly in the brain because the brain is designed to think in terms of narratives and to relate to events and conversations through the construction of tales [17]. Moreover, Storytelling may foster creativity on a variety of levels. It is possible, for example, to be emotionally engaged by events that we have not personally experienced by listening to someone else describe them [18].

## 7 METHODOLOGY

Digital museums are one type of museum that can attractively present the historical information through the use of many design tools like digital storytelling, to transform the information that is no longer exist into an interactive three-dimensional digital exhibit, which will enable viewers to effectively travel back through time and visualize monuments and eras that cannot be physically seen anymore [19]. However, very little research looks into the role of digital storytelling in reviving the Islamic heritage era in digital museums. Therefore, this research aims to fill in this gap.

So, the main aim of this research is to look into the validity of providing museums with storytelling tools. Consequently, the following questions will examine in order to achieve this aim:

1. To what extent the digital storytelling tool can be applied in museums to revive the Islamic heritage in a visual and interactive three-dimensional way?
2. Can this tool turn intangible information into visual, tangible, and interactive displays?
3. How does the use of this tool affect the individual's experience?

The research methodological approach that will be followed is the qualitative approach. It is commonly used to understand concepts, ideas, or experiences by collecting and analysing non-numerical data, such as text, visuals, audio, or video [20]. The method that has been used is the analysis of a case study that tackles a proposed design for a digital museum that focuses on reviving the Islamic heritage through the adaptation of digital storytelling. The reason for selecting this method is that a case study is a detailed study that can be used to describe, compare, evaluate, and comprehend different parts of a research question, especially since the paper subject is related to space design. [21]. The case study is a proposed design that was made for the exhibition centre building in Sanabis, Bahrain, which has an area of 7,300 m<sup>2</sup> and a height of 11 m, and this proposed design was made to measure the effectiveness of digital storytelling as a capable tool of transforming intangible materials into tangible materials. The main idea of the case study is to create a digital art museum that revives the Islamic era, which was thriving with the achievements and inventions of Arab scholars who sacrificed for the sake of humanity's elevation, but we are no longer able to visit the buildings or live the lives that people and scholars did in this area due to the demolition of this historical legacy. the design focused on transforming existing information about the Islamic period from *1001 Inventions: The Enduring Legacy of Muslim Civilization* book [22] into a practical and tangible design through the use of digital storytelling, as well



as some supporting technology. However, the participant was the interior designer, interior design supervisor, in addition to three jurors (one is an interior design doctor from university of Bahrain, and the others are doctors from KSA that specialized in interior design. The case study has been done in 8 months, the programming stage has been done in period of 3 months from September to December 2020, while the design stage started from January 2021 and end up on April 2021.

8 FINDINGS

The main idea behind the design is to create a digital art museum that revives part of the Islamic golden age. The era, which was thriving with the achievements and inventions of Arab scholars who sacrificed for the sake of humanity’s elevation, but we are no longer able to visit the buildings or live the lives that people and scholars did in this era due to the demolition of this historical legacy. As a matter of fact, the design focused on transforming existing information about the Islamic period from *1001 Inventions: The Enduring Legacy of Muslim Civilization* book [22] into a practical and tangible design through the use of digital storytelling approach, as well as some supporting technology, to reflect the life that the scholars were living, such as how the markets, cities, buildings, alleys, and places that helped these scientists look like to promote their ideas a practical and tangible design. The first step was reviewing the literature of this particular historical era (Islamic golden age) after that storyboard tool was used to design the theoretical knowledge reviewed from the literature and then organize the literature into main different ideas to be used in each hall as explained in Fig. 1. The storyboard helped arrange theoretical knowledge into the halls’ design content for the museum. As a result, the following story emerged: The museum’s story is a universe that belongs to Arab scholars in the Islamic golden era, their lives, accomplishments, and struggles. Hence, to achieve the aim of reviving this era that does not exist anymore, the concept of immersion with this universe was developed, as each hall in the museum will show a part of this story in-depth using technology in conjunction with exhibits using a digital storytelling approach. The main goal of incorporating digital storytelling into the design process is to engage visitors in the narrative by allowing them to experience the distinct era and interact with exhibits that depict the story’s events.

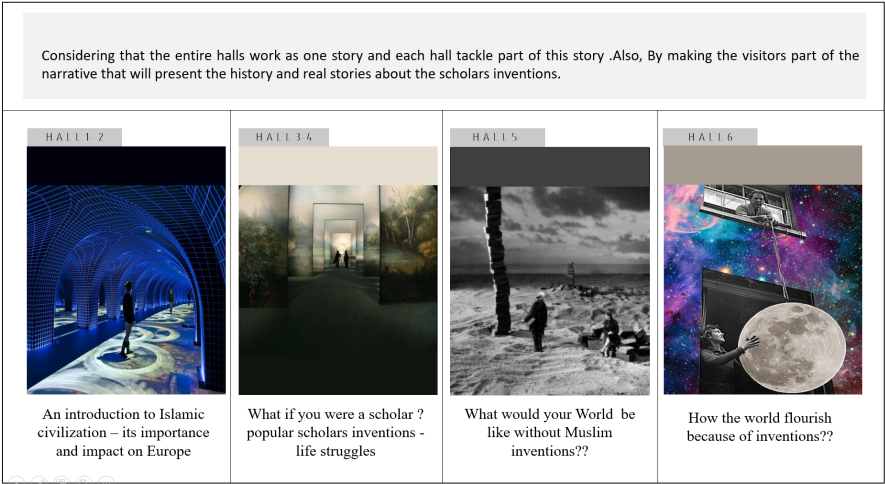


Figure 1: Storyboard that explain the museum content.



The following part will explain the idea of each hall based on the following points:

1. Main concept of the hall
2. How the idea is implemented following the storytelling approach
3. The value of the hall

### 8.1 Hall 1

The concept: this hall functioned as the story's introduction that will indicate to the visitors about the museum content and will prepare them for the journey. The idea has been implemented by adding tangible arches were placed and covered with smart screens in addition to smart screens that will be mounted on the floor, ceiling, and walls to display digital content on all of these features, resulting in an immersive atmosphere for the individual. The screens will display many questions about a specific time in the Islamic era, such as stories and common gossip about this era, through loudspeakers, with the colour of the screens changing depending on the type of speech heard; for example, if the part that was shown talks about the suffering of one of the schoolchildren, such as Jaber bin Haiyan's travel journey for the sake of science and inventions, the screens will appear in red (Fig. 2). The main value of this hall is to evoke the sense of curiosity and pleasure in discovering the following halls as it's the starting point of the museum journey.

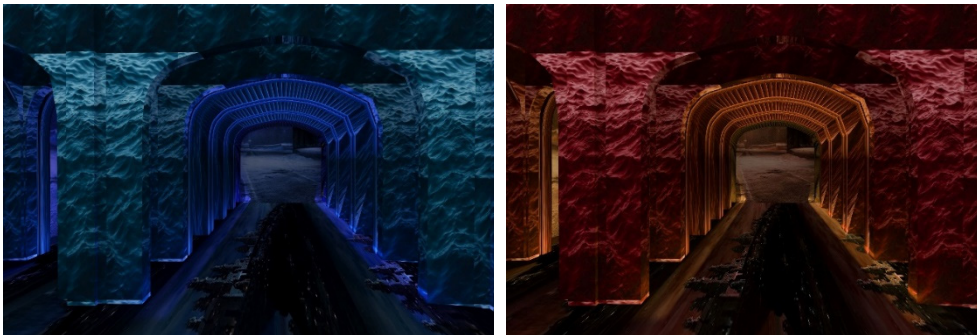


Figure 2: Colour changes in the digital screen of hall 1.

### 8.2 Hall 2

The concept of this hall is related to the first hall, but into more details as this will reveal more the museum story, it will clearly inform the visitor what the story of the museum is about, which particular periled of the Islamic era the museum is tackling? This will be accomplished by projecting a short documentary on freestanding screens depicting the most prominent scholars of the Islamic Golden Age and how the globe thrived as a result of their inventions and achievements. The tangible exhibits will be used in addition to the freestanding digital screens, where semi-vanished buildings will be installed behind the screens and interactive panels will be installed in the walls, ceiling, and floor to serve as a background for these buildings (Fig. 3), giving the individual the impression that he is moving from the modern world to the Islamic era. The value of this hall is that it transforms theoretical material about the Islamic era, which no longer exists and in which individuals cannot live, into an interactive experience in which the individual may participate and live.



Figure 3: Interactive flooring, ceiling and wall in hall 2.

### 8.3 Hall 3

The idea of this hall is strongly related to the previous hall, where in this hall the individual has moved to the Islamic era and start to begin his journey. The hall is under the title (What if you were a scholar?) The hall represents the first phase of the story which is the life of the scholar Jaber bin Haiyan, where the events were quoted and inspired by the documentary series “Life of Jaber Bin Haiyan”. The goal of this hall is to allow visitors to experience the life of scholar Jaber bin Haiyan in all of its intensity and prosperity, such as when he was traveling alone and couldn’t find water or ink to finish his studies, in addition to the agony he endured from the Abbasid princes. The idea will achieve by installing a bridge from the beginning of the hall to its end (Fig. 4), where visitors walk from this hall to the next hall, in order to embody the idea of Jaber bin Haiyan traveling over deserts and seas and how he was chased by the Abbasid state. The bridge was designed to depict Jabir bin Haiyan’s fear and insecurity while traveling on foot. Moreover, rock statues were erected on all sides of the bridge to be used as a background, where the projector will reflect the content upon those statues. A digital screen will be installed in the floor, displaying the visual and sound of water to depict how Jaber looked for water on her land trips but couldn’t always find it. Visitors will be exposed to wind breezes, and temperature whiffs as they travel under the bridge, in accordance to the context of the display that will be projected on the rocks, to make them part of the experience as these modifications alter how they engage with what they see. The value of this hall lies in the concept of transporting visitors to the golden Islamic era by immersing them in Haiyan’s story, as this experience will foster empathy and appreciation for scholars about whose lives, sufferings, and sacrifices we know nothing about except their achievements.

### 8.4 Hall 4

The concept: This hall illustrates how our lives might be different if Arab scholars had not invented and achieved what they did. The life of the scholar Ibn Sina, as told in the book *1001 Inventions: The Enduring Legacy of Muslim Civilization*, influenced the design of this hall. As this hall attempts to transfer visitors to one of the Islamic Golden Age villages in order to witness the lifestyle of the scholar Ibn Sina and his contributions to mathematics and medicine, where he used to produce medications out of herbs and practice medicine for free. The concept was achieved by dividing the hall into multiple areas that represented the village’s landmarks using both physical and digital exhibitions. For example, in one of the





Figure 4: The bridge extending from the beginning to the end of the hall, in addition to the projected videos on the artificial mountains.

corners, a wall and a real door were constructed, and then its polished with neutral colours that gave the impression of old walls, and in the other corner, a storehouse for Ibn Sina herbs was set up, with wooden shelves and some furniture that gave the impression of antiquity. Digital screens, on the other hand, were used to display contents that could not be applied or presented for some other reasons (Fig. 5). The value of this hall is that will create a feel of appreciation to those scholars.



Figure 5: A perspectives show how the idea of village is implemented in the hall.

### 8.5 Hall 5

This hall attempts to reflect the importance of scholar's inventions upon our life, as the basic object that we tend to use every day can affect our activities if may not be available in our lives like domestic equipment's. The concept was created through the use of conceptual art that is based on models and items, as well as digital technologies that will serve as the hall theme. For example, conceptual art was used to explain how the simplest things we use every day, such as the bed, could not exist without the scholars' inventions, by using a real bed that was installed in various ways, once the bed was fully installed but once it's installed as a

structure only, until the bed parts faded away (Fig. 6), to embrace the idea that we would not have homes, clothes, or a comfortable bed without the scholars' inventions. The main value is to remind visitors of the significance of inventions that they may not realize because they are familiar with and used to. As a result, the usage of conceptual art will allow the visitor to examine the displays more attentively and question what they are seeing. Why was it set up in this manner? What's the goal of all of this? Until they reach their true purpose, but digital technology plays a part in the creation of these questions by adding a sensory and interactive dimension to the conceptual side.



Figure 6: The perspectives show the physical items of the conceptual art are installed alongside the digital technology.

## 8.6 Hall 6

The main idea of this hall is to remind the visitors that because of the inventions that the human achieved, our world flourished. As a result, each individual can improve and enhance the way we live by full filling our world with the inventions the world. The concept was applied by displaying the most important inventions created by mankind throughout history on interactive digital screens that cover the hall's walls, floor, and ceiling (Fig. 7), all of which will be blue in colour, to give the visitor the impression that his life has become more comfortable as a result of these inventions made by various people. Therefore, his role lies in the appreciation of these inventions.

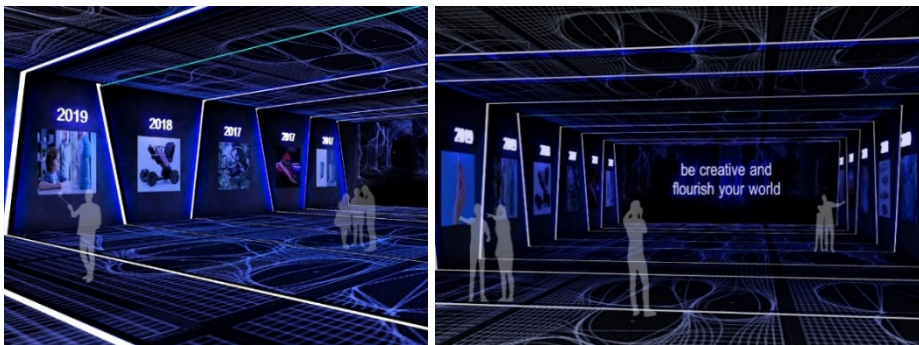


Figure 7: 3D perspectives for hall 6.



## 9 DISCUSSION

After completing the design stage, the project was granted to three experts. The project was evaluated by them based on how the digital narration tool was used in the museum to revive the golden Islamic era in an interactive way that attracts visitors, they were evaluating as shown in Table 1.

Table 1: Experts' opinion toward how the storytelling was implemented in the proposal design.

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First expert  | The first expert concentrate on the design elements in relation to the storytelling; he believes that using storytelling to create design elements has resulted in an experience that aims to put the visitor first in order to attract his attention and ensure his engagement, as attracting the visitor's attention and making him interested in the museum display is a design priority in order to ensure the museum's work continues. Furthermore, while employing theoretical information to extract design aspects to be used in the content of the halls can be tedious, incorporating digital storytelling into the mix provided an element of engagement, enjoyment, and suspense to the museum's content.                                                                                      |
| Second expert | The second expert focused on technology input and the implementation of the exhibits. The second expert pointed out that the use of physical exhibits besides technology creates unique mechanics for museums that help to educate, excite, and amaze the visitors. Moreover, it helps and succeeds in bringing the golden Islamic era to the life as the visitors will be allowed to examine and interact impressively with those exhibits. Furthermore, the use of digital storytelling with technology and physical exhibits will allow the greatest number of visitors to enjoy the museum's content, as the display method is appropriate for people of all ages, especially the current generation, which prefers tangible and technology-dependent objects to ordinary and intangible objects.      |
| Third expert  | The third expert emphasized the significance of digital storytelling in terms of enhancing the visitor's experience. The usage of digital storytelling resulted in the creation of unique experiences, as each time the digital narration was employed, the visitor's experience in each hall was distinct. For example, the digital narration tool was able to transport the visitor to an era that did not exist, in addition to that, it made the visitor live part of the life of scientists in an era that no longer exists. As a result, the role of the digital storytelling tool varies from one hall to the next, and each hall has a different impact on the visitor, as it sometimes encourages him to interact with the exhibits and at other times makes him ponder and leads him to explore. |

## 10 CONCLUSION

To sum up, storytelling is a powerful tool that can be used in the design process to enhance the user experience, and it can be used especially in museums to revive display information that is no longer accessible or exists, such as the Islamic golden age, and it can be used to create multi-sensory experiences that will simulate the visitors' five senses and motivate them to fully engage with the museum content. Furthermore, combining technology with storytelling will be an effective way to educate visitors while keeping them entertained.



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