

Museums Display Technology Through Storytelling Design

Assist.Prof. Dr. Ola M. Mohammed Ahmed

Associate Professor, Department of Interior Design, Oman College of Management and Technology, Sultanate Oman.

omohammed@ocmt.edu.om

Abstract:

Museums are a world full of knowledge, skills, and experiences. Storytelling is a powerful tool for museum design, considering digital technology. The art of storytelling reflects the cultural elements of the world. Storytelling is the way we communicate and learn in museum design, where stories and storytelling are told through exhibitions. The research is based on technology, which has become a great way to tell stories about the museum's interior design. The significance of the research is to design museums through technology and storytelling, to convert static displays to dynamic displays, and to create interactions between visitors and the display. The research concluded that integrating technology into design allows designers to engage with visitors and share their storytelling. Therefore, the study shows that technological solutions might be employed to fill this void in engaging digital material. The research follows a descriptive and analytical approach to the design of digital material. The research aims to study the emotional appeal to visitors through engagement and storytelling and the various techniques that museum technology employs to tell stories by using creative themes and concepts in museum interior design and incorporating storytelling into museum exhibits. Consequently, the main concern is to use technology in museum design to interact with visitors and tell their own stories. Stories are no longer only in novels, but rather their importance lies in the world of design to create excitement to explore creative spaces in the world of museums and combine them with technology to create digital stories in museum display design. Furthermore, the design stories in museums are creative, demonstrating the technology to describe culture, geography, and civilization. Finally, the research emphasized the importance of storytelling and technology to create highly immersive experiences for visitors.

Keywords:

Storytelling Design, Technology, Display Technology, Museum Technology, Engaging Design.

المخلص:

المتاحف عالم مليء بالمعرفة والمهارات والخبرات. يعد سرد القصص أداة قوية لتصميم المتاحف، مع الأخذ في الاعتبار التكنولوجيا الرقمية. إنها تعكس فن رواية القصص العناصر الثقافية للعالم. رواية القصص هي الطريقة التي نتواصل بها ونتعلم بها في تصميم المتاحف، حيث يتم سرد القصص من خلال المعارض. يعتمد البحث على التكنولوجيا، التي أصبحت وسيلة رائعة لسرد القصص حول التصميم الداخلي للمتحف. وأيضاً، تكمن أهمية البحث في تصميم المتاحف من خلال التكنولوجيا وسرد القصص المبتكرة، وتحويل العروض الثابتة إلى عروض ديناميكية، وإنشاء تفاعلات بين الزوار والعرض في المتاحف. ولقد أدى تطور تصميم المتاحف من خلال العروض التفاعلية إلى تحويل تجربة المتحف التقليدية إلى شيء أكثر جاذبية وابدعية وخيالية. وخلص البحث إلى أن دمج التكنولوجيا في التصميم يسمح للمصممين بالتفاعل مع الزوار ومشاركة قصصهم. ولذلك تظهر الدراسة إمكانية توظيف الحلول التكنولوجية لملء هذا الفراغ في التعامل مع المواد الرقمية. يتبع البحث المنهج الوصفي والتحليلي لتصميم المواد الرقمية. الهدف من البحث هو جذب الزوار عاطفياً من خلال المشاركة وسرد

تحت عنوان المؤتمر "الإنسان وتنمية الصحراء عبر التاريخ من الخليج الى المحيط" القصص في التصميم الداخلي ودراسة التقنيات المختلفة التي تستخدمها تكنولوجيا المتاحف لسرد القصص باستخدام موضوعات ومفاهيم إبداعية في التصميم الداخلي للمتحف ودمج رواية القصص في المعارض المتحفية. وبالتالي، فإن أهمية البحث في استخدام التكنولوجيا في تصميم المتاحف للتفاعل مع الزوار وسرد قصصهم الخاصة. ولم تعد القصص تقتصر على الروايات فحسب، بل تكمن أهميتها في عالم التصميم لخلق الإثارة لاستكشاف المساحات الإبداعية في عالم المتاحف ودمجها مع التكنولوجيا لإنشاء قصص رقمية في تصميم العرض المتحفي. علاوة على ذلك، فإن قصص التصميم في المتاحف هي إبداعية، وتظهر التكنولوجيا لوصف الثقافة والجغرافيا والحضارة. وأخيرًا، أكد البحث على أهمية سرد القصص والتكنولوجيا لخلق تجارب غامرة للغاية للزوار.

الكلمات المفتاحية:

تصميم السرد القصصي، التكنولوجيا، تقنية العرض، تقنية المتاحف، التصميم الجذاب.

1. Introduction

Art is the source of stories; technology gives museums a more dynamic storytelling experience. When visiting the museum, visitors are searching for innovative approaches to discovering ideas. One of the techniques that can be used to make storytelling more attractive. The ability to visit museum galleries and hear stories from diverse cultures is essential to increasing intercultural convergence. The impact of telling the museum story through interior design and the effect of that on engaging emotions through storytelling. Stories allow us to express the topics of presentation within museums in creative ways. Furthermore, technology has created a world full of excitement for users to promote the use of technology in museum design with stories. [١] In addition, research investigates the integration of storytelling and technology into design. The presentation of storytelling is seen as a means of increasing participation in design as dynamic artworks that can be displayed, and the walls of the museums can be transformed into living art paintings. It is a delightful combination of art and technology that encourages curiosity and promotes deeper communication between scenes and artwork. The story must be compelling to encourage visitor participation. [١] People can engage, learn freely, and exercise critical thought in a museum. Public engagement has risen due to digital technology. The storytelling is conveyed through paintings, animation, videos, and texts. Storytelling presentations have been a technique to connect design aspects and boost public participation. [2]



Figure. (1) Illustrates interaction with technology and visitors in story design for display. [3]

Research demonstrates the different ways in which museums use technology to present their stories. [4] The research is based on an interactive design analysis between museum interior spaces and visitors through storytelling. The demonstration of techniques for creating museum spaces starts with the layout of the exhibition area and finding methods to incorporate technology into the display space. Digital display spaces in museums are to create innovative storytelling strategies. Nowadays, museums may develop captivating storytelling that breathes new life into handicrafts by including multimedia components like animation, virtual reality, and movies. Visitors can investigate different perspectives, engage with historical contexts, and develop a deeper comprehension of the cultural significance of the items on display. The transition from traditional to digital display areas is a challenge. Museums must carefully strike a balance between integrating technology and maintaining the physical authenticity of artifacts. They also need to address the issue of the digital gap and make sure that everyone can benefit from digitalization. The research studies the shift from traditional to digital approaches, explores how digital technologies affect museum experiences, and examines how museums adapt to the evolving requirements and expectations of their users in the digital era through stories in interior design. [5]

2. Research Problem

The research problem is the gap between the museums that are typically on traditional display and, occasionally, the absence of display content and visitor interaction that is consistent with the display to close this gap and create engaging digital content, technology can be utilized to convey stories.

3. Research Aims

The research aims to use storytelling and interaction to attract visitors at an emotional level. The research is based on the discovery of the various methods in which museum technology is used to tell stories in the display.

4. Research Importance

The study contributes to improving the importance of transforming from a traditional fixed display to an attractive dynamic with advanced technology. Technology contributes to this by designing an attractive show that motivates visitors to participate.

5. Research Hypotheses

The study assumes that storytelling in museum technology is very essential to the content for narrating stories through technology in museum displays. While researching the effects of technology conversion on museum experiences, research studies how to create technology storytelling for museum displays as well as the strategies to implement these inside the spaces. In addition, the study assumes that stories can translate difficult information and content through museum designs.

6. Research Limits

The study is limited to the significance of technology and storytelling in providing visitors with immersive experiences through their journey in museums. It also highlights the need to encourage technology use in museum design while including these elements in the design. The research delves into the realm of museum design by utilizing technology, innovative trends, exhibits, and other opportunities that facilitate interactive engagement and visitor interaction.

7. Research Methodology

When designing digital content for museums design, the research uses the descriptive-analytical method that involves establishing stories and technologies inside museums.

8. A Theoretical Framework for the Research

8.1 The Traditional Design of Museums and Interactive Design

Strategies employed in smart museums' display spaces which have transitioned from traditional to digital have had a significant impact on the historical changes in the museum design. In smart museums, the way artifacts are exhibited for visitors to interact dramatically with evolved display. This shift in visitor expectations is a result of technological advancements, which guarantee smart museums' relevance in a world going digital. [5] The transition from traditional smart display space strategies to digital display spaces has been a significant factor in the historical development of the museum sector. There has been a significant shift in how museum's exhibits display themselves and engage with the public. The evolution of technology, evolving visitor expectations, and museums' requirements to adjust to the digital era are apart from these changes. Digital technology has made it possible for museums to hold more immersive and engaging events and to see higher visitor participation. These developments improve the visitor experience and aid in understanding museums' collections by allowing them to be shown in novel and captivating ways. Digital tactics such as virtual tours, interactive instructional tools, and virtual platforms allow museums to reach a wider audience. Since ancient times, museums have been recognized as vital cultural establishments for the public display and preservation of artwork and handicrafts. The presentation strategies for these groups have evolved due to advancements in technology and changing visitor expectations. This study demonstrates the historical development of interactive museum display strategies and their evolution from conventional to digital approaches. It is critical to convert from conventional presentations to immersive, and interactive experiences to increase visitor participation and promote cultural understanding in museums that are now able to offer a variety of subjects and storytelling thanks to the multimedia revolution and technological integration. This development enhanced the experience of visitors and increased the museums' cultural significance, making them more suitable and accessible to a larger range of people. [5]

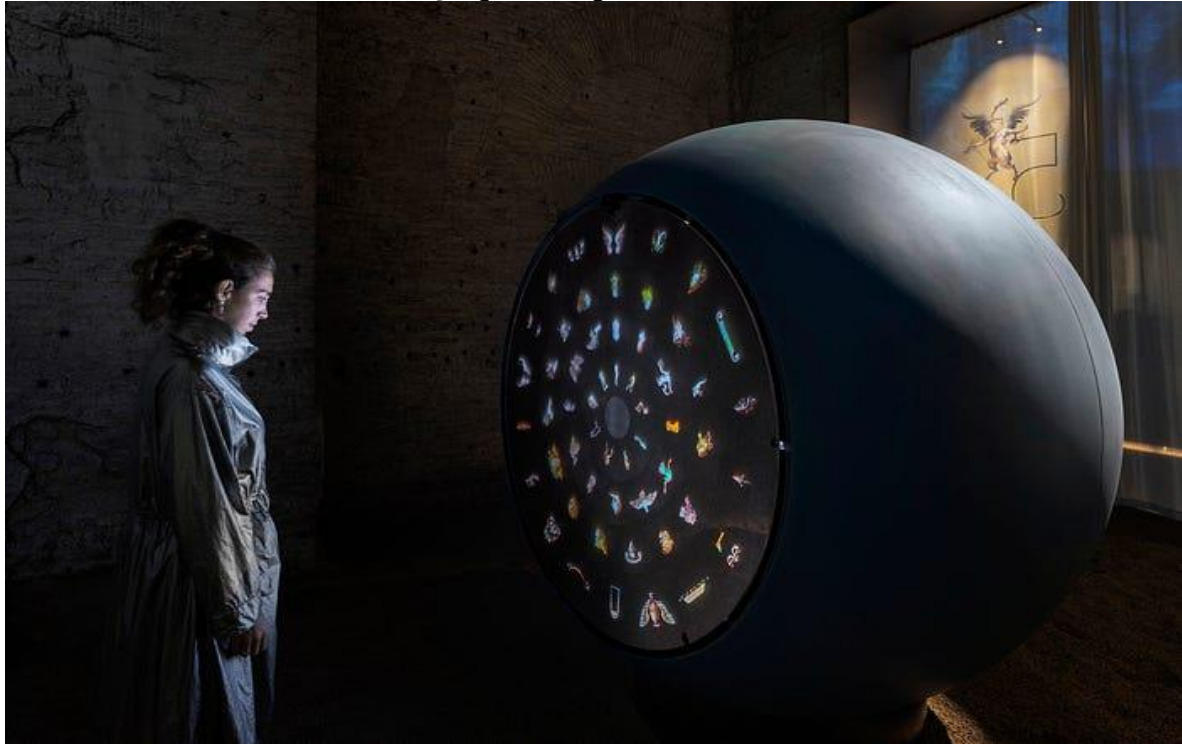


Figure. (2) Illustrates the engaging technology inside the display of museum design. [6]

8.2 Historical and Cultural Characteristics in Museums

The integration of digital technologies into museum display spaces has led to a significant shift from traditional displays to overwhelming, interactive, and creative experiences. This breakthrough transformed the way smart museums interact with their visitors, offering them imaginative opportunities for discovery, education, and interaction with art, history, and culture. Enhanced space storytelling can engage viewers' interest and enhance visitors' experience. The construction of a spatial environment marks the beginning of the museum's shift in the current space plan, in addition, it reinforces the role of education by storytelling. There has been a notable transition in the interactive museum space approach from traditional to digital experiences. The advent of digital technologies has drastically changed how museums connect with their patrons, providing them with engaging, customized, and interactive experiences. This shift has improved the educational and cultural impact of the areas where museums are located and allowed them to grow. [5]

8.3 Integration Between Technology and Experience in Museum Design

The combination of technology and art evokes interest and encourages viewers to discover knowledge from artwork interaction. The viewers become active participants in the art journey. The story must be compelling to encourage storytelling and visitor participation, even with the use of audio-visual technology in the museum presentation design. [١] The integration of digital technologies into museum display spaces has led to a significant shift from traditional displays. Enhancing space storytelling can stimulate viewers' curiosity and improve visitors' experience. The shift in the modern museum space strategy begins with the creation of a spatial atmosphere, and the museum narrates all the time, thus enhancing the role of education from museums. [5]

8.4 The Interior Design of Attractive Museum

Nowadays ,technology is an essential component of design strategies, with the use of digital technology in museums, visitors can engage in more meaningful social interaction within exhibitions. This variety of options improves museum design and the way their themes are presented. In addition to creating new channels of communication, technology also enables interaction between viewers and displays. Increasing intercultural understanding among visitors requires their ability to view museum exhibitions and hear stories from other cultures. Thanks to its ability to create creative tales within museums, technology has emerged as a valuable tool for museum design. This demonstrates how digital technology can overcome chronological, physical, and cultural limitations in museum displays. [4]



Figures. (3) (4) Illustrate the interior design of the Bush Mechanic exhibition that uses the television program as a means of exploring car accreditation in central Australia. [4]

This exhibition uses a lot of technology, from AV monitors and standard tablet devices, iPad applications for augmented reality, AV monitors manually, video games, and an open car route. The exhibition takes visitors on an overwhelming journey that challenges what it means to be human through seven latitudes. In interior spaces, visitors can explore augmented reality. There is an augmented reality app for iPad on a base on both sides of the car that allows visitors to interact with the board. Augmented reality (AR) brings dreams to life, where every board is moving in turn as visitors listen, allowing delivering the story directly to the visitors themselves (Figures 3,4). [4]

8.5 The Role of Digital Multimedia in Interior Design of Museums

Digital signs open a whole new dimension to artistic expression. Through large-scale digital display screens, they can display dynamic and mobile artworks, and turn the walls of the museum into live paintings, from the wonderful combinations of video to motion displays. Digital indicators enable viewers to actively participate in the artistic journey. It is a fun blend of technology and art that sparks interest and encourages closer interaction between the viewer and the piece of art. In addition to digital signals adding a dynamic element to the storytelling experience, art frequently functions as a jar of stories.

Multimedia components including audio snippets, interviews, and historical footage can be incorporated with visual art in museums. They build multifaceted storytelling that overwhelms visitors with knowledge and a rich history by fusing several mediums. [٧] An overwhelming design can be used to attract visitors, raise their curiosity, and maintain their interest. Video displays featuring unique images and audio effects are pulsating through museums. [3]



Figures. (5) (6) Illustrate the use of multimedia in the interior design of the museum. [3]

8.6 Museum Display Technology

Traditionally; Museums are being places in which artifacts are displayed and preserved while offering visitors historical and cultural insights. The use of interactive presentations has resulted in an evident shift in museum design. This innovative approach aims to reshape visitors' experiences and interactions with the exhibitions.

Museums are now in a new phase of providing captivating storytelling through stunning digital combinations and incredible interactive presentations. Through the integration of virtual reality, augmented reality, and other interactive methods, these interactive museum exhibits encourage visitors to actively engage and learn. [^]

8.7 Interactive Presentations and Public Engagement

Technological advances have greatly transformed museums. These innovative museums use the latest techniques to provide visitors with immersive and alluring experiences.

Virtual reality (VR) and augmented reality (AR) have also made their way into museums, where they provide mind-blowing experiences that breathe new life into artifacts and historic sites.

A new era of interactive story presentations has been ushered in by the integration of interactive technology and museum design, which has enhanced visitor experiences and shaped future trends in interactive museum design. [^]

8.8 The Design of Great Experiments in Museums

Utilizing the most recent advancements in technology, immersive experiences are leading the way in reinventing museum interior design by generating dynamic and engaging learning spaces. These layouts enable guests to delve even deeper into historical events, travel to far-off locations, and engage with objects. Museum experiences are changing quickly through interactive technology. This trend reflects the need for more engaging and dynamic museum experiences, which pushes the boundaries of innovation and alters how we view and engage with the environment. [^]



Figure. (7) Illustrates the design experience for visitors in the museum. [6]

8.9 Interactive Exhibitions in Museums

Interactive exhibitions in museums offer many key advantages, which contribute to revolutionizing design and the experience of the visitor. The incorporation of augmented reality (AR) and virtual reality (VR) into museum exhibits boosts audience engagement by offering immersive and fascinating experiences. Visitors can interact with digital compounds on actual items using augmented reality (AR), and they can view and comprehend things more deeply through multimedia content. [^]

8.10 Enhancing the Participation of Visitors in Museum Design

Enhancing visitor participation is the primary objective of museum design, and advancements in technology are essential to realizing this objective. The experiences of interactive museums have expanded with the introduction of augmented reality (AR) and virtual reality (VR). Visitors can efficiently engage with displays because of these overwhelming approaches. These developments in interactive museums promote learning via discovery and draw crowds with entertaining and participatory performances. Advancements in technology within museums are transforming visitor involvement and creating experiences that are more dynamic, engaging, and memorable than in the past. [^]



Figures. (8) (9) Illustrate using effective technology through display in museum design. [6]

8.11 Integrating Augmented Reality (AR) and Virtual Reality (VR) into Museums

It is possible to merge virtual reality (VR) and augmented reality (AR) to create engaging experiences. With the design of these immersive museum trends, visitors can engage in imaginative interactions with displays. Visitors can apply digital information on physical artifacts using augmented reality (AR), giving them life through rich multimedia content. However, visitors can travel through time and space using virtual reality (VR), which enables them to experience many eras and places and fosters more meaningful and profound knowledge. In addition to attracting those visitors, the interactive museum experience encourages active learning, investigation, discovery, and a greater understanding of art and history. [^]

8.12 Interactive Design and Display in Museums

Interactive design and display revolutionize the museum scene through technological advances such as augmented reality (AR) and virtual reality (VR). These technological advancements provide museums with countless opportunities to engage and attract visitors. Visitors can acquire digital substances on physical displays through augmented reality (AR), which enhances their comprehension of interactive multimedia material. The next phase is virtual reality (VR), which allows users to explore far-off locations or relive historical events in a completely immersive three-dimensional setting. Thanks to technological advancements, museums may now offer interactive experiences that encourage deeper connection, active engagement, and exploration in addition to traditional fixed displays. To transform museum visits and open new horizons for learning, empathy, and appreciation of history and arts, interactive design and presentation must be implemented. [^]



Figures. (10) (11) Illustrate the interior design of the Luigi Rovati Museum Foundation. It is the first comprehensive digital system designed with visitors' and museums' requirements in mind. This offers a visitor experience that can foster a continuing engagement between the public and the museum. [6]

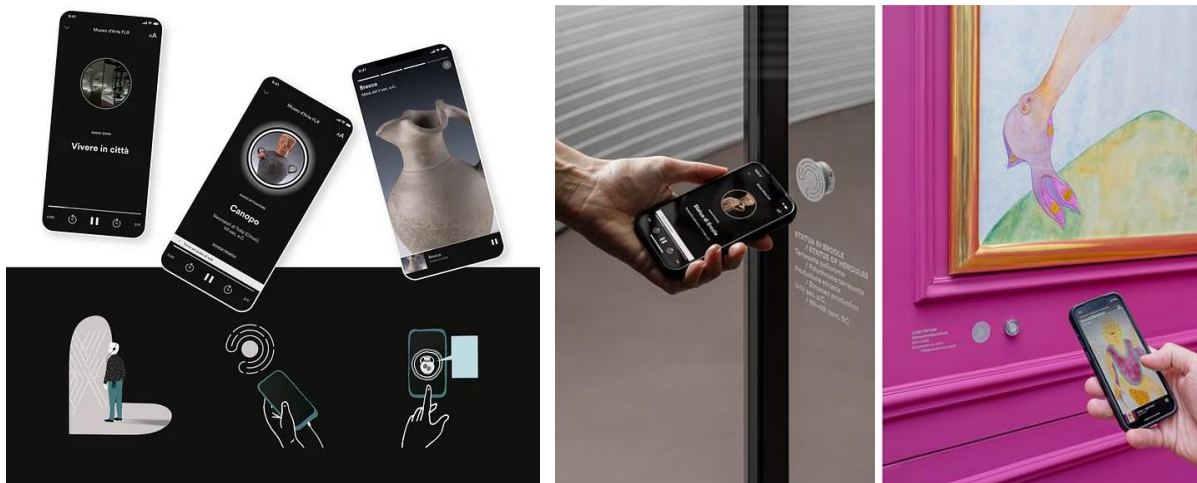


Figures. (12) (13) Illustrate museum aiming to keep visitors interested both before and after their visit, a thoughtfully designed digital approach enhances the personal experience. [9]

Depending on the inputs given by the system before, during, and following the visit, the system reacts to various needs. [9]



Figures. (14) (15) Illustrate the interior design of a museum that generates solutions by putting people and their needs at the center of the process. [9]



Figures. (16) (17) Illustrate the people-centered approach results in the identification of the visitor's experience, museum management objectives, and guidelines that underpin the design of future creative museums. [9]

9. Telling Stories during the Museum Display

Storytelling has always been fundamental to human existence. Throughout history, humans have always told stories, from the earliest drawings on cave walls to the modern digital age. It is the way we learn, interact, and communicate. The museums are the only places where sharing stories is more common than anywhere else. Exhibits and museums have used art collections to tell stories and novels about creation, history, art, and the natural environment. Exhibit design in museums helps to better connect the stories of nature, human history, and human nature.

Nonetheless, a variety of strategies might be developed to make museum storytelling more immersive. [١]



Figure. (18) Illustrates the storytelling design with technology in the museum. [6]

9.1 Storytelling Definition

Stories are tools for life since they are a collection of methods and devices that convert informational elements into emotion to communicate with the audience. Every design, especially museum design, conveys a moment or an experience; there is no design in silence. These are vibrant, dramatic areas with a lot of components and narrative symbols on show to convey design ideas. [5] Designers are dreamers and storytellers; they are drawn to communicating through museum spaces and telling stories. This is especially true of interior designers and architects. Museums use scenography and theatrical performances to create an environment that challenges visitors to use their imaginations. [10] The research includes storytelling, which gives rise to creative experiences and visual representations that offer up new avenues for idea exposition in museums. Aside from producing content based on imagination, creativity, and communication, storytelling also seeks to engage, inspire, and encourage visitors inside the museum setting through eye-catching and inventive displays. [11]

9.2 Novels Themes Designs in Museums

- Offer everyone: Designers, and visitors a stage for sensory experience. [12]
- Stories translate content into physically accessible, three-dimensional environments, producing so-called 'narrative spaces. [13]
- Novels convey their multi-layered (historical, social, cultural, educational, etc.) for multi-levels of content and meaning. [14]
- Novels can be accessible to any subject, then convert this content into enjoyable knowledge for entertainment.
- Novels contextualize objects.

9.3 Engaging Emotions Through Storytelling Museum Design

The people attend museums to get new ideas, and they are searching for new ways to discover ideas. They desire to take a more active part in the process of exchanging knowledge. The research supports the use of storytelling and engagement to evoke strong emotions in visitors. Stories allow us to express global topics in a more personal way. The best approach for people to understand the information is through storytelling experiences that allow them to hear, see, and feel as others do. Furthermore, designers create visitor experiences that are a lot like a movie scene or a novel structure, which fosters learning, meditation, and creativity. [٣]



Figures. (19) (20) Illustrate the story of design that visitors play a leading role during the enchanted night walk in Lake Kan, an experience inspired by the tradition of telling stories to a Japanese community. [3]

The journey of this project through Kan show National Park revolves around the novel of the Ainu myth, "Boom and Gibert." This practical storytelling allows guests to see, hear, and feel the Ainu culture and to gain a stronger appreciation for their reverence of the natural world (Figure 19,20). [3]

9.4 The Effect of Virtual Reality (VR) Storytelling on Museum Design

People can recognize history, culture, art, science, and other subjects in museums. To enhance engagement and participation, it is now even more crucial to shift from traditional to imaginary design. Museums can employ virtual reality (VR) tales to provide visitors with more engaging and immersive experiences. [١٥] The world of museums is intertwined with art and technology, creating an innovative experience that goes beyond traditional boundaries. Technology invites viewers to explore. Storytelling takes on new dimensions, where elements of multi-sense media are ignited and flooded in the storytelling behind art. With augmented reality, the art of digital signs brings together traditions and innovation in harmony, creating a dynamic and overwhelming meeting. [٧] The study highlights the significance of integrating technology and storytelling to provide visitors with immersive experiences. The story must be powerful if there is a heavy dependence on technology. This confirms that the subject and story are more important than the technology employed to communicate them. [١٦]

9.5 Graphic Design and Storytelling in Museum Design

Storytelling is important to tell historical tales and to talk about and comprehend how they have affected our lives over time. To maximize the experience, visitors should get in contact with a skilled creative director or storyteller. This opens up new perspectives on history for coming generations. [١٦] The storytelling heavily relies on the signs and graphic design components

found in museum exhibits. The museum's storytelling heavily relies on the usage of graphic design elements and traditional signs. [١]



Figure. (21) Illustrates the design of the display in the museum that is based on storytelling and technology to describe the traditions of the stars in Corna. [4]

This project is the length of touch screens that are several meters long. The visitor must remain close to the screen and continuously run through the entire story by putting his handcliffs against the glowing handprint. This display will alter to reflect each season as it occurs. However, as of right now, films and cartoons depict the events of Codela's current season, which is the rainy season that lasts from July to September. Indigenous observations, dreams, and legends are some other ways that the solar system might be understood and adapted outside of the framework of Western astronomy. Science on a Sphere: Employing these instruments to travel from Earth to outer space while encircled by touch screen panels (Figure 21). [4]



Figures. (22) (23) Illustrate the interior design of the Titanic Belfast museum (D J Willrich Ltd). [١٦]

The seamless integration of technology and storytelling is essential for producing experiences and bringing historical events like the Titanic to a contemporary audience. [١٦]



Figures. (24) (25) Illustrate the interior design of the Motor Museum's Motopia exhibition (D J Willrich Ltd). [١٦]

The museum's design is to install a six-meter video wall in the foyer, which will welcome guests and provide up-close views of the artifacts in the corner. Huge projections inside the larger galleries feature exact duplicates of the falconry items featured in the falcon gallery. The revival of woven animals at the Islamic carpet festival allows guests to experiment with color and demonstrate how different hues can be from one another in historical sculptures. [١٦]

9.6 The Evolution of Storytelling in Museum Design

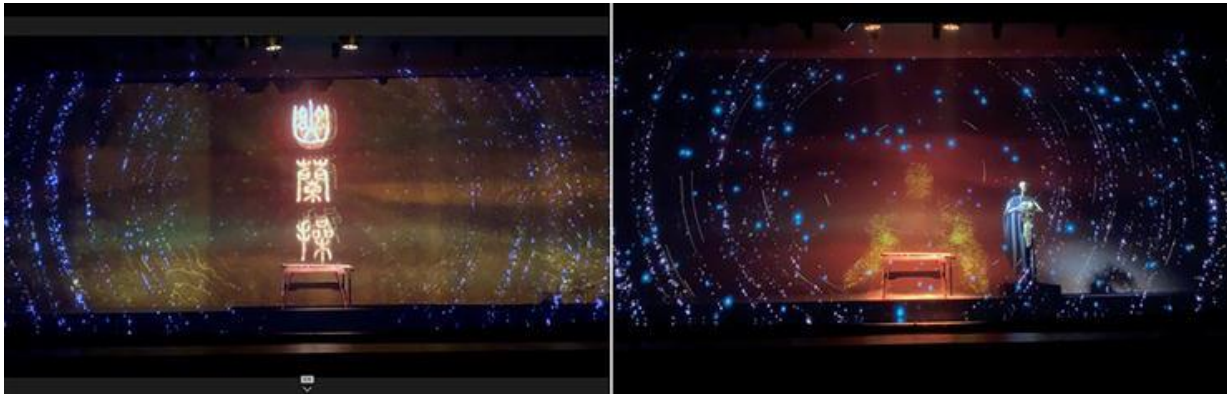
Exhibitions in traditional museums rely on fixed displays, but as museum technology advanced significantly, the value of storytelling inside the museum environment became clear, enabling museums to do more than just share knowledge. Museums have been able to immerse their guests in captivating stories and novels through interior design. Museums may bring exhibits to life and place them within a storytelling framework by using storytelling. When creating museum content, storytelling is essential. The museum's story is one with history, and we communicate with the public through storytelling. Well-known brands have long been storytelling experts, but interactive content is being utilized more and more to help make information more visually appealing and meaningful to the general audience. [١٧] One feature is interaction, which lets players decide what to do, deal with issues, or change the story's direction. The utilization of 360-degree settings broadens the scope of storytelling by enabling people to investigate and engage with the story from every perspective. [١٨]



Figures. (26) (27) Illustrate the Confucius Museum's "Drawings of Confucius Saint Deeds" which has an interactive digital fusion scene. [10]

9.7 The Importance of Storytelling Using Virtual Reality Technology in Museum Displays

Virtual reality (VR) storytelling has the potential to improve museum displays by offering several benefits, including enhanced participation. Visitors can get a direct and emotional experience with content by attracting their interest and curiosity. Virtual reality (VR) storytelling has the potential to simplify and improve museum displays for a variety of audiences by showcasing a range of viewpoints and fostering greater empathy. In addition, it might offer more context and depth to help visitors appreciate the significance of objects, occasions, and cultures. [١٥]



Figures. (28) (29) Illustrate the interior design of the Confucius Museum, and it shows the use of technology. [10]

9.8 Design of Virtual Reality Storytelling for Museum Displays

Precise planning and implementation are essential when designing a virtual reality story for museum exhibits, and these are the important design stages: [١٥]

Table. (1) Illustrates stages for designing a virtual reality story in museum exhibits. [١٥]

The stages for designing a virtual reality story in museum exhibits	
1	Identify the objectives and audience of the story.
2	Identify the user's target.
3	Identify the user's preferences.
4	Determine the statute and coordination needed to present the virtual reality storytelling.
5	Develop the content and structure, including key elements and scenes of the virtual reality story.
6	Arrange and link key elements and scenes.

7	Study the user's interaction with museum display and influence the story of virtual reality.
8	Examine and evaluate the usability, functionality, and overall impact of virtual reality.

9.9 Interaction Design and Storytelling in Museum

Digital technology, storytelling, and interactive design allow stories to be told in a new way. This fosters empathy and establishes a direct connection between the visitor and the space, allowing a journey through historical and artistic ages that make the experience of the visit unique, unforgettable, and participatory. [٦]

Table. (2) Illustrates the aims of storytelling through technology in museums. [٨]

The aims of storytelling through technology [٨]	
1	Studying the role of interactive storytelling in attracting the attention of visitors.
2	Exceeding the traditional exhibition display.
3	Integration of multimedia experiences to engage diverse audiences.
4	Using touch, sound, and sight to create unique experiences.
5	Designing interactive displays for easy browsing.
6	Integration of experiences of augmented reality (AR) and virtual reality (VR).
7	Enhancing the interaction of visitors through interactive technology.
8	Promoting a deeper understanding of complex topics.
9	Promoting effective participation and exploration.



Figures. (30) (31) Illustrate the story of interior design for AR's Aboca experience exhibition through using technology. [18]



Figures. (32) (33) Illustrate interaction design in museum design. [19]

10. Criteria and Fundamentals for Applying Storytelling in Interior Design in Museums

- Today, designers transform the museum's world into the entertainment world through scientific, cultural, historical, and entertainment experiences.
- Therefore, the designer creates stories in museum environments, besides, transforms the environment into an innovative world.
- The role of designers in creating new concepts, including techniques and methods of storytelling in museums.
- The visitor's journeys in the space, in addition to studying basic standards and strategies in the design of the museum's display.
- When designers apply storytelling in the main design elements or principles or strategies for interior design in museums.
- The atmosphere of storytelling is through ideas, elements of the display, light, materials, colors, ceiling design, flooring, material, and rhythm of music (Figure 34). [20]
- Designers can use artworks and innovative artistic approaches to enrich the exhibition content. [21]
- The design of displays is a very important factor in designing the storytelling for the museum.
- Designers should select the suitable type of museum according to the theme inside the interior design.
- The space planning for the museum depends on the novel and story concept so designers should study well all activities and zones to draw stories creatively in all spaces in the museum.
- Finally, theatrical thought will open opportunities for narrative experience and visual images which will create new possibilities for presentation, excitement, curiosity, and smooth movement into museum space.

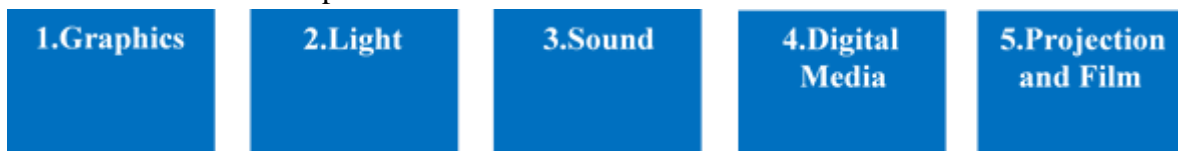


Figure. (34) Illustrates the tools of storytelling in interior design for museums.

11. Results

- The research concluded that integrating technology into design allows designers to engage with visitors and share their storytelling.
- Stories are no longer limited to books; they are now vital to the field of design to build tension and excitement when exploring creative spaces in museums and utilizing technology to create digital stories in museum display design.
- Museums can display stories attractively and imaginatively, and this indicates the ability of digital technology to overcome cultural, spatial, and temporal barriers within museum exhibitions.
- The evolution of museum design through interactive exhibitions has transformed the traditional museum experience into something more engaging, immersive, and comprehensive.
- The use of advanced technologies, such as virtual reality (VR) and augmented reality (AR), has completely revolutionized how visitors interact with exhibits, encouraging participation and collaboration.

- With Technological advancements and virtual technologies, museums can offer customized experiences to visitors, creating endless possibilities.
- The design of interactive museums is evolving and incorporating new technology such as machine learning and artificial intelligence.
- Museums have evolved into lively, interactive spaces where people can easily participate in learning and entertainment.
- Through the field of museum design, visitors can have life-changing adventures that arouse curiosity, wonder, and a greater comprehension of the world around them.
- Interactive exhibitions have revolutionized museum design, offering visitors immersive and interactive experiences and innovative displays.
- Interior Designers can create dynamic spaces that inspire, educate, and engage visitors of all ages in museums.
- Interactive displays encourage curiosity, critical thinking, and creativity, as visitors are encouraged to explore and participate rather than passively observe.
- Virtual reality at museums shapes visitors' emotions in many ways.

12.Recommendations

- Museums are considered a fundamental and significant force in the development of life. The integration of technology and content storytelling is crucial in the museum context to design memorable and transformative experiences that leave a lasting impact on visitors.
- Over thousands of years, smart museums have evolved into a variety of styles and forms to increase the emphasis on social responsibility for smart museum exhibitions in cultural appreciation, historical tracing, scientific research, education, and promotion.
- Hence, it is important to develop traditional museums, as many countries contain great civilizations and history, because of the weakness of the methods of display inside the museums, there is no demand to visit these museums.
- Finally, it is important to study storytelling in museum design content to attract and motivate visitors to participate, while creating and encouraging a new innovative approach in the adventurous world of museum design through technology.

13.References

1. Colorcraft3d. Storytelling Through Museum Exhibit Design. 2023; Available from: <https://colorcraft3d.com/blog-post/storytelling-through-museum-exhibit-design/>.
2. Birchall, D. Big and slow: Adventures in digital storytelling. 2016; Available from: <https://mw2016.museumsandtheweb.com/paper/big-and-slow-adventures-in-digital-storytelling/index.html>.
3. Momentfactory. The Future of Experiences. 2020; Available from: <https://medias.momentfactory.com>.
4. Carfora, N. Storytelling and Technology. 2018; Available from: <https://mod.org.au/2018/10/31/storytelling-through-technology-the-intersection-of-museums-and-technology/>.
5. Yang, H. and L.J.H. Guo, Evolution of exhibition space strategies in smart museums: A historical transition from traditional to digital. 2024. 7(1): p. 1-11.

6. Dotdotdot. When storytelling becomes multi-sensory. 2021; Available from: <https://dotdotdot-it.medium.com/when-storytelling-becomes-multi-sensory-4d4553bf75d7>.
7. Chinyoka, J. How Museums and Galleries Embrace Technology. 2023; Available from: <https://www.linkedin.com/pulse/how-museums-galleries-embrace-technology-jeremiah-chinyoka>.
8. Globe, E. Revolutionizing Museum Design: A Look at Interactive Exhibitions. 2023; Available from: <https://exhibitionglobe.com/museum-design-at-interactive-exhibitions/>.
9. Dotdotdot. The first fully integrated digital system customized to visitor and museum needs. 2022; Available from: <https://dotdotdot-it.medium.com/the-first-fully-integrated-digital-system-customised-to-visitor-and-museum-needs-a2661079dfce>.
10. Zhang, L., et al., Perspective Chapter: The Integration Narrative of Media and Space in Museum, in Application of Modern Trends in Museums. 2023, IntechOpen.
11. Ding, M.J.M., a.r.A.c.o.e.f.t.a. management, and t. laboratory, Augmented Reality 2017: p. 1-15.
12. Ghouaiel, N., et al., Mobile Augmented Reality in Museums. 2017. 17(1): p. 21-31.
13. Cárdenas Gasca, A.M., et al. Sensitive Narratives. in Proceedings of the 2022 ACM Designing Interactive Systems Conference. 2022.
14. Chen, C.-A. and H.-I.J.S.P. Lai, Augmented Reality in Museums. 2021. 104(3_suppl): p. 00368504211059045.
15. community, L. How can VR storytelling enhance museum exhibits? 2024; Available from: <https://www.linkedin.com/advice/3/how-can-vr-storytelling-enhance-museum-exhibits-jeypf>.
16. Feature, I. Storytelling. 2023; Available from: <https://advisor.museumsandheritage.com/features/the-importance-of-storytelling-when-building-tech-first-experiences/>.
17. Ball, K. Storytelling in Museum. 2023; Available from: <https://www.thinglink.com/blog/why-storytelling-is-important-in-the-21st-century-museum/>.
18. Dotdotdot. The Corporate Museum as an Experience. 2020; Available from: <https://dotdotdot-it.medium.com/the-corporate-museum-as-an-experience-4934f24128e0>.
19. Dotdotdot. Corporate museums - the challenge of representing the intangible. 2019; Available from: <https://dotdotdot-it.medium.com/musei-dimpresa-come-rappresentare-l-intangibile-f22857b0d58c>.
20. Kahr-Højland, A.J.N.M., Museums and Learning. 2007(1): p. 3-3.
21. Jung, T., et al. Virtual Reality and Augmented Reality on Visitor. in Information and communication technologies in tourism 2016: Proceedings of the international conference in Bilbao, Spain, February 2-5, 2016. 2016. Springer.