Introducing Virtual Museum with Rich 3D Experience

Akila Moorthy*

Assistant Professor, SRM Institute of Science and Technology, India

*Corresponding author: Akila Moorthy, Assistant Professor, SRM Institute of Science and Technology, India

Abstract

The field of Information technology has a massive progress in the digitization process, becomes more diversified. Presently, many of renowned museums have construct virtual environments in the form of digitized information on their web pages or pre-recording their tour guide over portable devices, which provides faster and easier access short of any time and space limitation and makes the visitors more convenient. Our objective is to designate different strategies that aid to enhance a visitor's virtual experience in a museum and art galleries through digital technology.

Keywords: Virtual reality; 3D modeling; cultural heritage; digital collections; user experience

Description of Problem

With the huge advancement of information technologies, the digitization process has become more progressive and diversified. Presently, a few well-known museums have created virtual environments in the form of digitized information on their web pages or pre-recording their tour guide through portable devices, which provides quicker and easier access without any time and space limitation and makes the visitors more convenient. Thus, the versatile analysis of virtual museums has the potential to enable greater understanding the values of resources to depot cultural heritage [1]. Bridge a gap between visitors and monuments, we must reinforce the importance of interactive activities at a greater level of engagement and sense of presence. It could be achieved through the implementation of Augmented Reality. Fortunately, the expectation of museum exhibitions is enhanced by blending the visit experience with more appropriate interaction with real objects and embodiment of personalization.

Review of Work Already Done

Preservation involves people managing change in ways that sustain, reveal, or reinforce its cultural and natural values [2]. The main barrier between museums and people is the lack of interactive activities and events that can engage society. Museums need to enforce them social role, provide interactive activities to various segments of the society and change them message as cultural engaging centers. With the usage of Technology and societal impact the traditional customs need to be preserved for future generations to play a complementary role in museum digitization. The landscape of traditional areas provides an effective expression of our culture and history which shows how society has evolved and focuses on which communities define their identity [3]. Visual effects of a virtual museum provide the viewing of monuments, but our idea brings the real visit of the museum by taking photos, to know the historic story of the monuments using chatbot and provides the effect of 3D visualization. With the lack of poor participation of viewers, the maintenance of the museums is quite difficult [4]. with the concept of virtual museum maintenance becomes easy and provides more convenience to the viewers by having a look and feel experience. The virtual tour reduces the travelling complexity of the viewers.

Challenge & Constraints

The major strength for implementing this project is availability of resources with easy access to digital information, licensed software, faculties with domain expertise support and we have

guidance from management to collect confidential information from the government sectors [5-7]. High lab facilities to do the research work available in our organization. Effective team with relevant knowledge to carry out this project work. Some of the points need to be concentrate on

a)   Since all museums come under the government sector, data collection is quite tough.

b)   Inadequate Laws Protecting Monuments, Poor physical planning mechanism, Poor community participation.

c)   Difficult in analyzing live streaming videos.

d)   Major challenge in maintaining up-to-date records.

The following points are identified as opportunities to implement this project, also predicted various threats with relevant solutions (Table 1).

Table 1: Opportunities and threats of AR/VR.

Opportunities	Threats	Resolve By
Envision a virtual experience that incorporates the benefits of traditional museum-going	Complete digitalization	Augmented reality techniques
Embodiment of personalization	Confront the issues of privacy	Providing individual login access
Navigation video content in 360^0	Various views in 3D perspectives	Graphical algorithm
Recommendation system based on feedback and survey	Validating the information, History of views, Predicting viewers interest	Devising prediction Algorithm
Frequent updation through the curatorial staff	Issue of outdated information data integrity, data replication	Spirit of innovative technology

Description of Proposed work

Our aim is to design a dynamic virtual museum to preserve and to promote cultural heritage and to widespread the historical information.

a)   To incorporate dynamic features, a versatile environment is created with emerging tools and technologies.

b)   To improve the quality of information resources by creating meta-descriptions.

c)   To create virtual guide to deliver the historic story in different multi-modal form.

The system architecture, which is presented in the (Figure 1) is composed by list of modules. The content production is enforced within the authoring tool of UNITY3D [8] and allows the educator to create various learning materials. It is also in charge for the organization of tasks that the user will whole during a particular scenario. Tasks are organized affording to a preplanned decision tree. A significant issue concerning the spatial design of the virtual gallery relates to the level of realism that characterizes its environmental rudiments. The designed VE is needed to be effective and to be used in spontaneous way while the resources of the system ought to be employed in the stylish probable manner. This paper claims that while the use of realistic metaphorical representations may allow for transfer of knowledge and skills involved in unremarkable conditioning, the use of realistic environmental elements limits the eventuality of VEs for creating novel forms, environments, and circumstances.
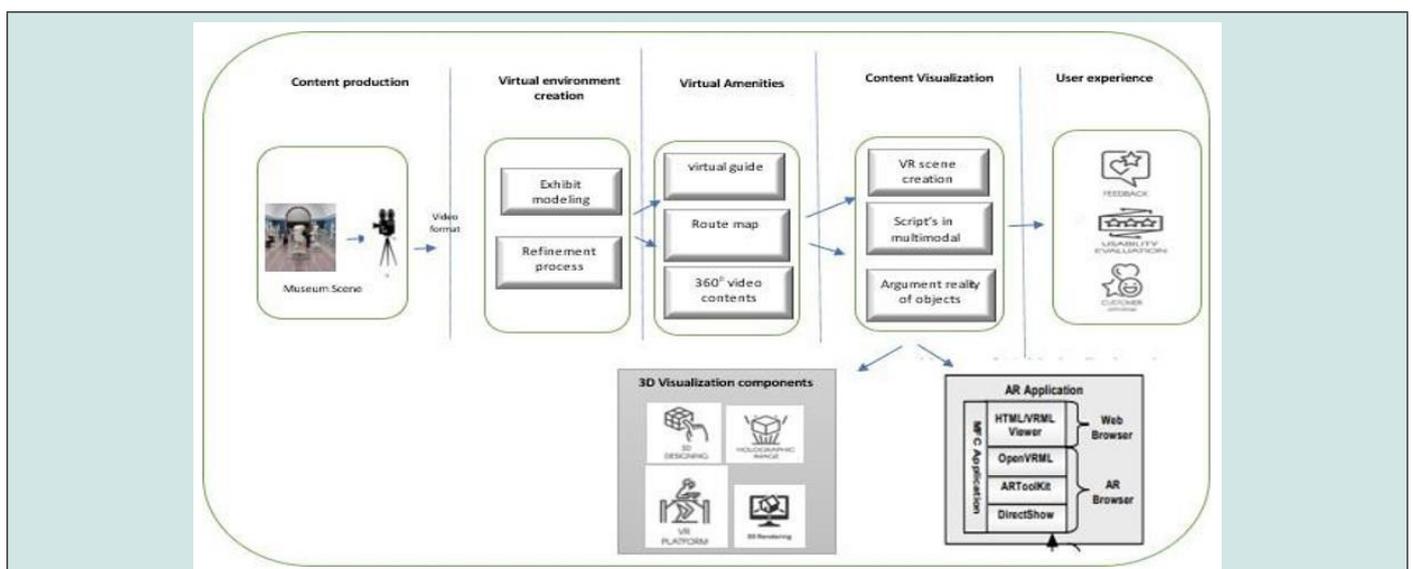

Figure 1: System architecture of AR/VR based system.

Therefore, the designed museum maintains certain generic environmental elements of the real world and attempts to investigate non-realistic forms and environments that are thought to improve the success of the exhibition surroundings. Immersive experiences are intensely enhancing the museums storytelling potential. VR can variety exhibits interactive, put things in context and illustrate their true scale, and bring an additional dimension to museum exhibitions and assortments. It is fluctuating the perspective of the viewer and creating a genuine connection with them. There are also excessive marketing openings obtainable by virtual tourism technology [9]. Probable visitors can see a 3600 view of a property and its facilities, rather than the flat images on a brochure or website. Experiencing a property this way surges the chances that viewers will want to visit in the future and means that they can easily share the virtual offerings with their friends and family.

With the help of state-of-the-art 3D services, sellers and sponsors are creating breathtaking 3D visualizations in 3D interactive maps, 360° visualizations, virtual reality, augmented reality, and 3D virtual tours. Each of these five new modes of marketing are fascinating new audiences that can enter an immersive visualization with any device, from anywhere on the globe, to see what awaits them if they take the next step. User Experience plays a significant role in the achievement of virtual tours since the platforms should deliver the services for user fulfillment. The virtual tour website should be user-friendly. Users should be able to circumnavigate through the website to locate the services or the goods they are looking for. Interactivity in virtual reality is collection of three elements. These are speed, range, and mapping. Speed is the response time of the virtual world. If the virtual world responses to user actions as swiftly as possible, it is considered an interactive simulation since proximity of responses affect the richness of the environment. Data visualization is the creation of visual representations of data. These representations clearly communicate perceptions from data through charts and graphs. In terms of business intelligence (BI), these visualizations help users make better data-based decisions.

Impacts of social and economic factors of Virtual Museum

a)   Delivers rich experience with the help of digital technology.

b)   Provides more convenient window visit

c)   Reduces time complexity which exhibits more information about Monuments

d)   Offers more benefits compared to physical visit in terms of cost efficient.

e)   Safeguarding our heritage assets from physical damage due to virtual visit

f)   Contribution to the education system [10].

Conclusion

In summary, this paper presented an enhancement approach for digital museum resources to improve the virtual experience of the participants is the major outcome of this work. A range of visualization technologies were explored including the widely used 3D construction technologies to investigate the effect of diverse technologies incorporated in online museums. Our proposed Virtual Museum website is designed with components like 3600 Matterport Camera system, chatbot, photography illusion, History details in text form as well as audio form, and virtual curatorial staff.

References

1. Apostolellis Panagiotis, Bowman Doug, Chmiel Marjee (2018) Supporting Social Engagement for Young Audiences with Serious Games and Virtual Environments in Museums. Museum Experience Design pp. 19-43.

2. Tien-Li Chen, Wei-Chun Lai, Tai-Kuei Yu (2021) Participating in Online Museum Communities. Front Psychol 11: 565075.

3. Britannica (2017) The Editors of Encyclopedia virtual museum. Encyclopedia Britannica.

4. James D. Wright (2015) International Encyclopedia of the Social & Behavioral Sciences, Second Edition, USA pp. 414-419.

5. Kevin Coffee (2008) Cultural inclusion, exclusion and the formative roles of museums. Museum Management and Curatorship 23(3): 261-279.

6. Alenezi Mona, Demir Fatih (2019) Understanding virtual reality tours: a user experience study with the princess norah university. Int J Curr Res 10(8): 3248-3253.

7. Pestek A, Sarvan M (2020) Virtual reality and modern tourism. J Tour Futures 7(2): 245-250.

8. Paul Williams, J. Hobson (1995) Virtual Reality and Tourism: Fact or Fantasy? Tourism Management 16(6): 423-427.

9. Hookham G, Nesbitt K, Cooper J, Rasiah R (2014) Developing a Virtual Tour of a Community Pharmacy for use in Education. Proceedings of IT in Industry pp. 33-37.

10. Fominykh M, Prasolova-Forland E, Morozov M, Gerasimov A (2008) Virtual Campus as a Framework for Educational and Social Activities. Int J Emerg Technol Learn.

To Submit Your Article Click Here: Submit Article
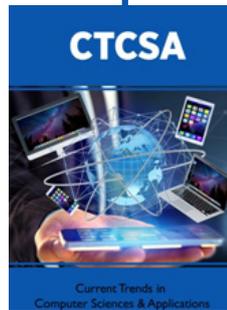
Current Trends in Computer Sciences & Applications

Assets of Publishing with us

- Global archiving of articles
- Immediate, unrestricted online access
- Rigorous Peer Review Process
- Authors Retain Copyrights
- Unique DOI for all articles