Muserator: Interactive App Empowering Curators in Museum Exhibition Content Design

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Abstract

Due to digitisation, museum exhibitions are evolving, with digital stories becoming vital for cultural education. *Muserator* offers a guideline for curators to create engaging digital content, particularly in Malaysian museums. Through qualitative research, this interactive application provides insights and tools for developing historical and cultural narratives. Future curators can enhance museum exhibitions by integrating *Muserator* into visual culture courses, fostering participatory experiences. This research supports museum educational advancements, aligns with SDG 4, Quality Education, and promotes lifelong learning opportunities.

1. Introduction

Over time, museum exhibitions have undergone significant changes due to several factors. Thanks to technological advancements, museums now have the opportunity to create more compelling and interactive exhibits, enticing visitors in new and exciting ways. As the expectations of museum-goers continue to rise, they are now seeking out engaging and dynamic learning experiences. With the growth of alternative forms of entertainment and leisure, museums have had to adapt by creating more immersive and captivating exhibits to attract and engage individuals. This evolution of museum exhibitions is set to continue as museums strive to remain relevant and draw in visitors. To achieve this, museum curators may require digital storytelling guidelines or training, and digital storytelling tools can prove helpful in aiding them. Ultimately, museums can enhance visitors' education and engagement by offering meaningful experiences. The design process of a museum exhibit involves a team of exhibition curators, designers, graphic designers, and architects working together to conceive, organise, and execute a display of artefacts or artwork that conveys a message. The exhibition design must captivate viewers while delivering a clear message. In order to be successful, a museum exhibit must be innovative, informative, and accessible, all while being visually appealing and exciting for visitors. Crafting a presentation that is both entertaining and educational requires creativity, technical skills, and an understanding of the audience's needs. Technology allows for endless possibilities in museum exhibitions, including interactive exhibits like virtual and augmented reality that can transport visitors to other times and places.

During the early 1990s, the availability of digital media production technology and software meant that consumers could create digital storytelling. As a result, multimedia exhibitions began to incorporate digital storytelling into museum exhibitions. The founders of the non-profit Center for Digital Storytelling established their digital storytelling approach (Hartley *et al.*, 2009; Lambert & Hessler, 2018). The impact of the community arts movement and the folk and activist cultures of the 1960s can be seen in the development of digital self-

expression, which was created to inspire empowerment and liberation. Modern museums have embraced digital storytelling technology to engage and captivate visitors, seeking to create immersive and interactive experiences that utilise technological advancements to enhance learning and participation within the museum. Museum exhibitions include digital storytelling in many ways by implementing multimedia elements such as storytelling utilising visuals, music and video to build a narrative arc and guide visitors through the exhibition (Pujol *et al.*, 2013; Wales, 2012). Besides that, personal narratives highlighting meaningful life events were the initial definition of digital storytelling (Robin, 2008) and interacted with the visitors by implementing gaming and quizzes (Miller, 2019).

Integrating digital storytelling into museum exhibits can significantly enhance the visitor experience and provide exciting new avenues for interaction with exhibitions. It is important to note that museum exhibits are carefully designed with a specific sequence, requiring curators with advanced skills and knowledge (Lin, 2003). As organisations continue integrating digital technology into their exhibits, curators specialising in digital storytelling are becoming increasingly vital (Dean, 2015; Kamaruddin, 2019). These experts possess the knowledge and experience to create engaging content and stories for museum exhibits, incorporating multimedia elements such as movies, audio recordings, and interactive displays. Moreover, they can offer guidance on seamlessly integrating digital content into physical exhibits, resulting in more engaging and innovative exhibitions.

Guidelines are a valuable tool for curators when designing museum exhibits. They aid in organising and effectively communicating exhibition information to viewers. A museum exhibition design guideline should include critical elements to meet the aims and objectives of the exhibit. The guideline should guide the exhibition's content, design, and arrangement while also planning for content creation and arrangement. Additionally, guidelines can promote inclusivity and accessibility for all visitors, with features such as audio explanations for visually impaired guests and tactile components for those with sensory impairments. They can also help assess the exhibition's success and gather visitor feedback for future designs. Following guidelines, museums can create engaging, accessible, and well-designed exhibitions. This study introduces Muserator, an interactive application guideline that can assist curators in learning to design museum exhibitions.

2. Literature Review

Interactive or software applications are dynamic platforms that enable users to actively engage with their content through various means, such as vocal commands, touch input, or gestures (Jr & Jake, 2023). These applications optimise user experiences by providing instantaneous feedback and interaction, ranging from educational tools like the Accomplish Reading Application to innovative methods for action-type recognition in wearable devices (Jr & Jake, 2023). They span diverse domains, including enhancing comprehension abilities, controlling video content on screens through mobile terminals, and determining interactive relationships based on movement information and preset conditions.

In museums, integrating interactive design and augmented reality (AR) has emerged as a significant trend to enrich user experiences (Md *et al.*, 2021). Through mobile AR applications, visitors can interact with artefacts, delve into historical narratives, and immerse themselves in augmented realities that enhance their understanding and engagement within museum spaces (Md *et al.*, 2021). These applications not only provide information but also aim to deliver experiences that are useful, usable, desirable, findable, accessible, and credible, thereby enhancing overall user satisfaction and enjoyment.

Complementing augmented reality, virtual reality (VR) presents another avenue for transforming tourist experiences within museum settings (Pfiel *et al.*, 2021). The research underscores the importance of crafting immersive VR applications tailored to user needs and preferences, ensuring positive experiences while mitigating cybersickness symptoms (Pfiel *et al.*, 2021). Despite the potential of VR to revolutionise museum engagements, challenges persist in designing user-friendly experiences that fully exploit the medium's capabilities, highlighting the need for meticulous attention to development and execution.

Moreover, interactive apps are crucial in presenting museum collections with complex logical interconnections that defy traditional display methods (Micoli *et al.*, 2020). Through specific case studies, such as exploring ancient Egyptian civilisation, virtual applications offer novel ways to elucidate intricate artefacts, symbols, and narratives, enhancing visitor understanding and engagement (Micoli *et al.*, 2020). By leveraging interactive technologies, museums can transcend physical constraints and provide dynamic learning experiences that resonate with diverse audiences.

With mobile technology, museums increasingly harness their potential to enrich visitor experiences and promote informal learning (Wei & Zhang Jianping, 2015). Mobile applications facilitate self-paced exploration, inquiry-based learning, and cooperative engagement, empowering visitors to delve deeper into exhibits and interact with content meaningfully (Wei & Zhang Jianping, 2015). However, ongoing efforts are needed to improve design and usability to fully capitalise on mobile technology's benefits, ensuring seamless integration into the museum experience.

In conclusion, the literature highlights the diverse applications of interactive technologies in enhancing user experiences within museum contexts. From augmented and virtual realities to mobile applications, these innovations offer transformative opportunities to engage visitors, deepen understanding, and foster meaningful connections with cultural heritage. Continuing research and development efforts are essential to harnessing the full potential of interactive applications and creating enriching experiences for museum visitors worldwide.

3. Methodology

The purpose of this study is to introduce the Muserator, an interactive application designed to assist curators in their efforts to create engaging museum exhibitions. The study was conducted through an exploratory research design which utilised qualitative methods, including semi-structured interviews with curators from departmental museums in Malaysia. The data was analysed using thematic analysis, following the six-phase framework developed by (Braun & Clarke, 2006). This method is both systematic and rigorous in its approach to analysing qualitative data. Furthermore, this research was approved by an ethics committee.

4. Finding and Discussion

This study aims to introduce Muserator, an interactive application guide for museum curators to enhance their curatorial skills in designing exhibitions. The study explores the elements and processes of digital storytelling in Muserator from a Malaysian curator's perspective. A qualitative approach was employed by conducting semi-structured interviews with six museum curators and analysing the data thematically using Atlas.ti software. The findings indicate that most curators are well-versed in digital storytelling elements, with the six main elements and thirteen sub-elements of point of view, story structure, overall look and sound, economy, soundtrack, and story rhythm being the most favoured among Malaysian curators.

The extent to which curators understand digital storytelling depends on their familiarity with the process. Most curators are well-versed in the workshop, pre-production development, and post-production phases of digital storytelling. However, some curators had a moderate understanding of the digital storytelling process as they needed to implement all of the processes. Curators use digital storytelling more often during the pre-production phase and less during the post-production and distribution phases. They prefer four phases of digital storytelling: workshop, pre-production, development, and post-production and distribution. Fig. 1 illustrates the curator's preferred elements and processes of digital storytelling for the museum exhibition.

Fig. 1 *Curator's preferred digital storytelling elements and processes for museum exhibition*

The Muserator interactive application guideline was created by following the design thinking process, as shown in Fig. 2, based on the data findings. This guideline aims to aid curators in learning how to design museum exhibitions.

Fig. 2 *Design thinking process*

The process begins with comprehensive understanding, thorough exploration, and practical materialisation. The first step involves empathising with and defining the needs and challenges of the current situation in museum exhibition content development. The exploration stage is where solutions are sought, and opportunities for innovation are discovered. This is followed by designing prototypes to create realistic representations of ideas. Finally, the third stage involves testing and implementing the ideas. During the first stage of understanding, there is a need to empathise with users and define their needs through research. This is a significant challenge as museum exhibition guidelines must be adhered to. The exploration stage involves ideation and prototyping to foster innovation. Brainstorming generates ideas, and digital storytelling elements are integrated into the process to create interactive application guidelines, as shown in Fig. 3.
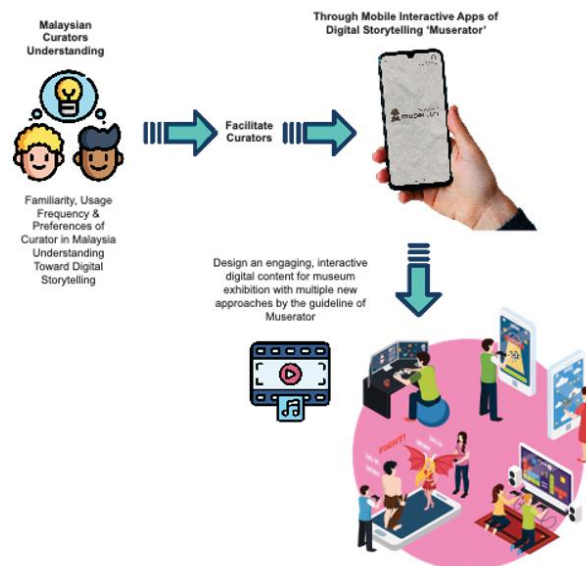

Fig. 3 *Ideation and brainstorming solutions highlight opportunities for innovation*

During the exploration phase, the specific digital storytelling elements and processes required by Malaysian curators were discovered, creating an interactive application considered a pioneer in digital storytelling guidelines explicitly designed for curators. The prototype, shown in Fig. 4, was developed to assist users in developing exhibitions. We designed it with an audio narrator to make it easily accessible to special needs curators who require audio assistance. The prototype design includes seven visual elements: line, shape, colour, value, form, texture, and space.

Fig. 4 *The prototyping of the interactive application guideline*

In the final stage of materialisation, the curators thoroughly tested the product and proceeded to its implementation. The feedback received from the curators was overwhelmingly positive, with some suggestions made regarding the interactive application guideline, Muserator. One suggestion was to integrate it into the curatorial program in higher education as a training tool for future curators to understand better designing museum exhibition content, particularly in digital form. Additionally, they recommended that it be included in the service design process, as it can produce and maintain plans, processes, policies, standards, architectures, frameworks, and documents to support the design of quality IT solutions for museums in Malaysia.

5. Conclusion

To sum up, this study has identified the crucial digital storytelling elements and processes Malaysian curators consider necessary for creating interactive applications that engage visitors and elevate the museum experience. Based on this research, the Muserator interactive application guidelines have the potential to aid curators in enhancing visitor engagement and learning, as well as offer fresh opportunities for curation and exhibition design. This study has revealed that the curators' preferred digital storytelling elements and processes are essential in designing a digital content exhibition that caters to Malaysian curators' perspectives. Our design principles for interactive application guidelines offer curators a structure for crafting engaging digital storytelling materials that meet their audience's requirements and preferences while ensuring a seamless and enjoyable user experience. Further research is necessary to conduct user testing and evaluate interactive application guidelines developed using our concepts to expand on our findings. Curators and designers must also explore innovative technologies and methods to integrate interactive applications into museum exhibitions. Overall, this study demonstrates how interactive applications following the Muserator guidelines have the potential to transform the museum experience and engage visitors in novel ways. By adhering to the criteria for digital storytelling interactive applications, curators can design exhibitions that are user-friendly and accessible to a broad range of people.

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Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

The authors confirm their contribution to the paper as follows: **study conception and design:** H.R., N.K. and B.I.; **data collection:** H.R.; **analysis and interpretation of results:** H.R.; **draft manuscript preparation:** H.R., N.K. and B.I. All authors reviewed the results and approved the final version of the manuscript.

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