# The Integration of Digital Storytelling with Information Visualisation on Exhibition Design in Museums: A Primary Inquiry

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**Abstract**
Various research have recognised that the museum plays a vital role in opening the path for broader learning experience while expanding knowledge to the general public. Recent technological advances have influenced many museum administrations developed strong interests in integrating cutting-edge technologies in progressing along with the leisure industries. Nevertheless, there are contrasting views between the Malaysian and Western perspectives on the exhibition approaches and for visitors' learning experience. Therefore, it is essential to identify emerging issues on museum exhibition design to integrate digital storytelling with information visualisation. Through adopting a qualitative method and descriptive-exploratory approach, this study revealed a knowledge gap based on literature review over a five-year period. The major contrasting view between the Malaysian and Western perspective is on the effective and meaningful ideas in creating extensive and highly developed future exhibition. Findings from this study can be used to formulate a digital storytelling approach with information visualisation in museum exhibition design.
**Keywords:** Digital Storytelling, Information Visualisation, Museum Exhibition.

**Introduction**
Storytelling in the museums has endured various changes in its presentation since museums were made available to the general public. The museum has been a unique venue and space to go to for a different knowledge experience that may be distinctive in its own way through the different showcases and exhibition approach. This is because the museum provides context and sensory simulation to its visitors. While the museums provide materials that have become widely accessible through alternative methods, the entire experience, ambience, context, and information remain uniquely distinctive. Rather than addressing the

roles of digital technology through the perspectives of museum artifact conservation, logistics, maintenance or as professional learning curves, the utilisation of technologies has been recognised and emphasized to enhance museum visitors' engagements by providing actual experiences of their use in real museum contexts (Vaz et al., 2017). With the coming of cutting-edge technologies, museum storytelling has evolved since the 19th century especially in the West and by the 20th century, storytelling in the museums transformed into more innovative presentations (Wyman et al., 2011).

With technological advances, museums have developed significant interests in using such development as a method in educating and engaging contemporary and future visitors. However, the ascending and contrasting views between the Malaysian and Western perspectives in the approaches of exhibition design and visitor learning experience call for further inquiry worth delving into. Subsequently, this would contribute in the understanding of the components or problems that must first be given thorough thoughts in museum design and visitors' needs for researchers, museum staff, and designers.

- The objective of this study is to answer the following research question; What are the types and collaborative tools used in the museum designs throughout a five-year timeline? The researchers examined the different Malaysian and Western perspectives on exhibition types and collaboration to identify the issues on museum exhibition design prior to integrating digital storytelling with information visualisation (Figure 1).
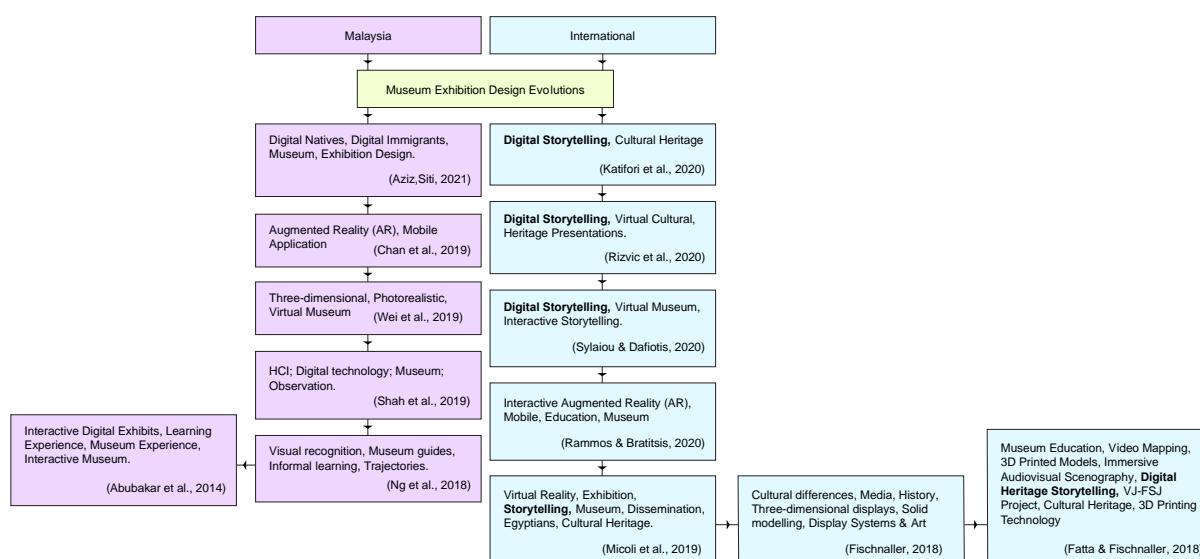


Figure 1: Summary of experts' and scholars findings in comparison issue of museum exhibition designs (Source: Author's Framework)

## Methodology

This qualitative research utilised the descriptive-exploratory method with systematic review on scholarly writings to gather data concerning prior research interests and exhibition implementation in the West and Malaysia. In the systematic review, all of the studies related to the topic are identified and scrutinized, appraised and synthesized, aiming to establish research results that are reliable and valid (Petticrew & Roberts, 2006). Consequently, each

study was summarized into a classification scheme and included with two central aspects namely, (i) What are the application types and collaborative tools used in Malaysian museum exhibition? (ii) What are the application types and collaborative tools used in Western museum exhibition?
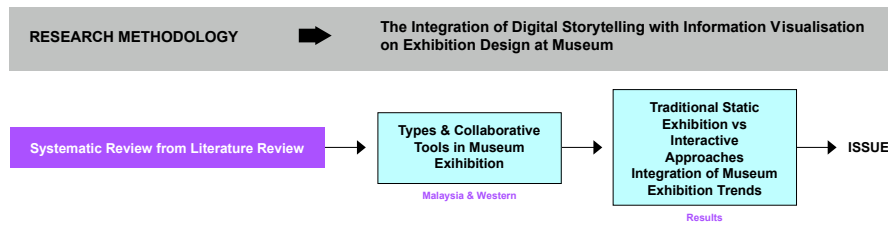


Figure 2: Flow chart of research process

## Application Types and Collaborative Tools in Museum Exhibition

The summary of scholarly writing through systematic review of museum exhibition designs has revealed that studying research from scholarly writing yielded suitable and distinct elements for museum exhibition design. However, this paper only highlights the preliminary synthesis of the sourcing narrative and identifying trend or gap with limited graphical displays. Figure 3 demonstrates the review of differences in museum exhibition design that focused on traditional static exhibition approach against interactive technology exhibition setting between Malaysia and Western countries.
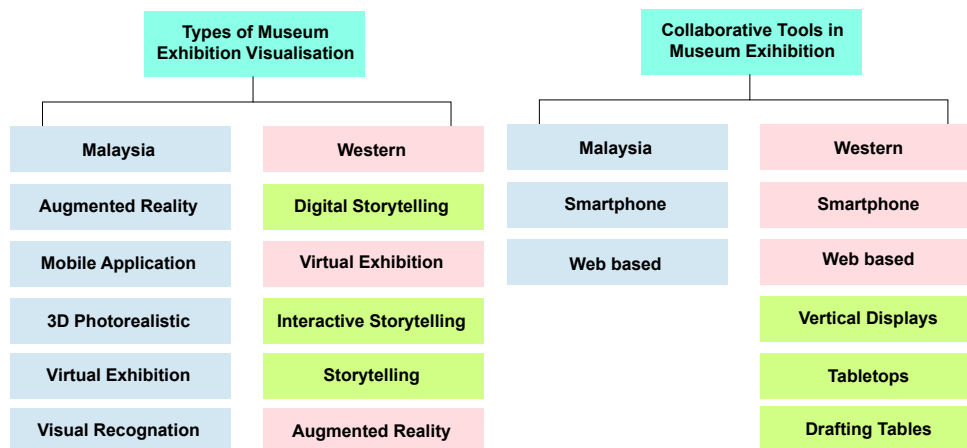


Figure 3: Diagram of the types and collaboration in museum design according to scholar (Source: Author's Framework)

Malaysia has demonstrated the platforms and techniques of museum exhibition evolution between 2010 to 2019. It all started with enhancing the information and communication level in the museum by through the implementation of ICT in the museum exhibition hall. However, the level of ICT used in the museum exhibition hall can be considered outmoded and wearisome for modern visitors (Bakar et al., 2010). In contrast, a study by (Abubakar et al., 2014) on user perception on interactive digital exhibition (IDE) reported that visitors accept the use of IDE and appreciate the aesthetic values of real artefacts. The development continues with enhancing the physical artefacts embedded interactivity on museum exhibition (Ng et al., 2018). In addition to interactivity, most Malaysian visitors used smartphones and (Shah et al., 2019) asserted that it is an excellent

platform to enhance visitors' experience and engagement with artefacts on exhibition in the museum for exciting and thrilling experiences. Significantly, the use of smartphones and other digital devices such as virtual goggle have encourage for research innovation in 3D virtual reality (VR) technologies to enhance museum exhibition experience. This can be achieved through the 3D reality-based model, which enables users to manipulate the artefacts and heritage structures in the development of virtual museums (Wei et al., 2019).

The trend in museum design research in the west started with the digitalisation era, with the aim of designing and representing the museum to become more interactive, engaging and exciting. Importantly, (Bedford, 2001; Fisher et al., 2008; Pujol et al., 2013) mentioned that storytelling has the potential to revolutionise the way societies engage with cultural heritage and has been widely recognised as an essential direction for attracting and satisfying demanding museum audiences. More significantly, such revolution not only improve but also intensify conservation efforts of cultural heritage sites. Additionally, the West has also implemented storytelling elements in their digitalisation process on museum exhibition and developed massive stocks of content from galleries, libraries, archives, and museums. It has been highlighted that museums focused on traditional oriented object also known as tangible exhibits (Eijnatten & Nood, 2018). This may be due to the fact that it is a challenge to present intangible content with meaningful expressions of spiritual ideas and viewpoints. Hence, a delicate approach with intangible artefacts is also necessary to stimulate opinions, memories, anecdotes and stories, thus adding to the reservoir of intangible heritage. Storytelling guidelines for museum exhibition digital content has been suggested by (Vrettakis et al., 2019) and presented in the Narrative Story Editor (NSE) for authors who use storytelling structural elements (chapters, scenes, pages) to reinforce the importance of narrative. The guidelines provide some direction to the author towards a story-centric approach and most importantly, it is cost-effective. It was also mentioned by (Sylaiou & Dafiotis, 2020) that producing digital storytelling for museum exhibition involves interactive components and is linked with digital content such as images, sounds, and videos, to produce a multimedia experience that allows for active participation from museum visitors. Presently, ICT provides tools, such as digital storytelling, that deliver complex and interactive information in virtual museum. It has permitted onsite and online experiences and opens up the line for conversation with visitors.

**Conclusion**
The trend in Malaysian and Western museum exhibition design has persuaded the digitalisation of museum exhibitions across multiple platforms. Importantly, a clear gap in the absence of narration or storytelling aspects, and the paucity in the use of the latest trend in Malaysian museum exhibition content via digital storytelling have been identified. This has also substantiated the findings of out-dated approach used in Malaysian museums compared to Western museum exhibition development design. It has also been established that the attention is inclined towards tangible artefacts and visitors' perceptions rather than intangible content in order to enhance the museums ambience. Meanwhile, the digitization of museum exhibitions only functions as a supplement instead of being maximised for exhibition design integration. The smartphones and other collaborative tools with equipment for virtual museum purposes such as the 3D goggle and web-based platform have been highlighted as information visualization tools.

**Contribution and Recommendation**

According to the findings of this research, further research in approaches of digital storytelling that are integrated with information visualisation for museum exhibition design is an essential element of the field of museology. This study contributes a fundamental knowledge base that may be used by researchers and academicians to develop solutions to the issues that have been found between museum exhibitions in Malaysia and western countries. The role in this context is to expand the collaborative tools as we follow the western trend that is appropriate and it can enhance the museum exhibition in Malaysia by innovators or curators.

**Acknowledgement**

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