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Conceptual Framework of Digital Storytelling for Museum Exhibition in Malaysia

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Abstract
Storytelling in museum exhibitions can draw visitors in and influence their minds. Digital storytelling (DST) enabled visitors to be involved in the characters' situations through the exhibition of personalised stories that combined personal experiences of historical events. Most research in digital storytelling has been limited to education, especially in Malaysia and the absence of cultural heritage focusing on museum exhibitions. This study aims to explore the significant and relationship of the usages of medium characteristics, benefits, and limitations of digital storytelling (DST) in cultural heritage as to develop a DST practical guideline for museum exhibitions. This study used a qualitative methodology with a contextual document analysis approach to explore the effectiveness of DST established by scholars. This study has highlighted the conceptual framework of DST guidelines that explain how DST attempts to engage exhibitions from curators' perspectives, hence facilitating the development of DST for museum exhibitions. The finding of this research is proposing the conceptual framework establishing a link between curators and DST to facilitate them while increasing visitors' engagement with the museum exhibits and it's may benefit curators in commercialising the museum exhibition and attracting visitors to the museum's digital content.
Keywords: Digital Storytelling, Storytelling, Museum Exhibition

Introduction

Storytelling brings together people through life experiences, whether they are reading, watching, or listening. Storytelling is standard around the world (Grisham & James, 2006). Stories convey real and understandable experiences, which can connect individuals or stories. The stories are educational but allow audiences to share their thoughts, feelings, and experiences. Storytelling in museum exhibitions can draw visitors in and influence their minds. The museum maintains historical artefacts by sharing forward stories. Therefore, museum visitors would expect these stories to be presented in unique, era-appropriate ways. Museums should understand how digital culture affects audience expectations and needs

(Giannini & Bowen, 2022). Digitalisation is vital to engage more museum visitors who can immerse themselves in history while achieving their expectations (Perouli, 2021). Thus, museum visitors should be enhanced by diverse storytelling methods. The use of digital storytelling (DST) enabled the visitors to be immersed in the characters' situation through the presentation of individual stories which combined personal experiences of the historical events.

In a simple definition, digital storytelling (DST) is a technology that combines the art of traditional storytelling with elements of multimedia such as images, graphics, music, video, and audio to create a story that is uniquely expressed in a digital format. In 1994, Joe Lambert and his pioneering contemporaries Dana Atchley and Nina Mullen established the San Francisco Centre for Digital Storytelling. In this regard, Lambert believes that DST allows individuals to engage in self-reflective thinking regarding the narratives of their lives (Rebmann, 2012). The mission of the CDS is to inspire other people with little to no background in media production or storytelling to share their personal stories in a digital format as part of a community setting. Every narrative would be turned into a collection of private recollections that could be shared with others. Since its establishment, the CDS has garnered due importance in developing digital storytelling.

Technology influences the world and opens new opportunities. The rise of digital-native visitors is a significant problem for museums implementing a digital exhibit approach (Abdul Aziz et al., 2019). Technology has also changed museum visitors' learning and judgement. Digital storytelling (DST) is the latest international trend in cultural heritage and museum exhibitions, and westerners focus on its usage and users' acceptance (Fischnaller, 2018; Katifori et al., 2020; Micoli et al., 2019; Rammos & Bratitsis, 2020; Rizvic et al., 2020; Sylaiou & Dafiotis, 2020). Cultural heritage and museum exhibitions have adopted this design globally. The use of a palette of digital tools in digital storytelling (DST) allows curators and visitors to weave their personal voice and experience into the story, assuming social changes followed technology advances. According to Liu & Lan (2021), most museum professionals and visitors like using digital technology to tell the stories. Digital storytelling (DST) is becoming a trend in Malaysian education. Digital storytelling (DST) is a strong instructional tool (Kogila et al., 2020; Nair & Yunus, 2021; Rahman & Bakar, 2020) However, the Media Pengajaran Berkonsepkan Penceritaan Digital (MPBPD) cautions that touch screen tablet guidelines are essential for designers and schoolteachers designing MPBPD applications using mobile teaching technology (Hussain & Shiratuddin, 2018). The MPBPD production approach for learner-generated comics helps learners create and develop digital instructional comics (Azman et al., 2019). Uggah et al. (2017) created a pre-production approach for preserving Iban folklores through digital storytelling (DST).

In (Ng et al., 2018), mobile visual recognition technology "Artcodes" was explored to improve visitor centre user experience. In (Chan et al., 2019) study on Labuan Museum's use of augmented reality (AR) revealed that the technology could improve visitors' learning outcomes while matching their expectations and providing a good museum experience. In conjunction with virtual museum, (Wei et al., 2019) established a methodology framework for digital recording and 3D reconstruction of archaeological artefacts and heritage monuments in Malaysia using terrestrial laser scanning technology. Audience perceptions and behaviour must be considered while building a new museum experience tool. (Abubakar et

al., 2014) found that museum visitors like interactive digital exhibits (IDE) that combine authentic artefacts with aesthetics. Accordingly, (Shah et al., 2019) found that museum visitors focused more on dioramas than artefacts and labelling. Thus, digital technology with interactive features improved museum visitors' involvement with the show, according to the study.

International studies on cultural heritage and museums indicate that digital storytelling (DST) is the optimum museum exhibition presentation method. Malaysian museum exhibitions are digitalized, but not integrated. Digital storytelling (DST) in cultural heritage and museum exhibitions is understudied in Malaysia. The approach also lacking guidelines on digital storytelling (DST) elements and process in museum exhibition. However, there is no evidence of curators' understanding of DST elements and process in producing museum exhibition in Malaysia. These limits created a 'research gap' and make this research significant because museum curators and designers need guidelines to design and develop multimedia cultural artefact presentations. The museum's future exhibitions and learning experiences will benefit from interactive digitalisation. This paper aims to explore the significant and relationship of the usages of medium characteristics, benefits, and limitations of digital storytelling (DST) in cultural heritage as to develop a DST practical guideline for museum exhibitions. Museum organisations are among the leading economic contributors in Malaysia. One of their fourth strategic plans is to implement new technologies in the documentation and presentation of historical artefacts in museums in conjunction with the digitalisation era and industry revolution 4.0 (IR4.0) to ensure their success in the development of the museum field in the future. Integrating DST in museum exhibitions is necessary to remain relevant in the contemporary technology-driven world and audiences. It is possible to use DST to tell a story on various media types, including computers, mobile devices, and electronic kiosks. Numerous formats, such as websites and online games, can cater to education, gaming, cultural heritage, and journalism in an interactive or non-interactive manner as a museum learning experience.
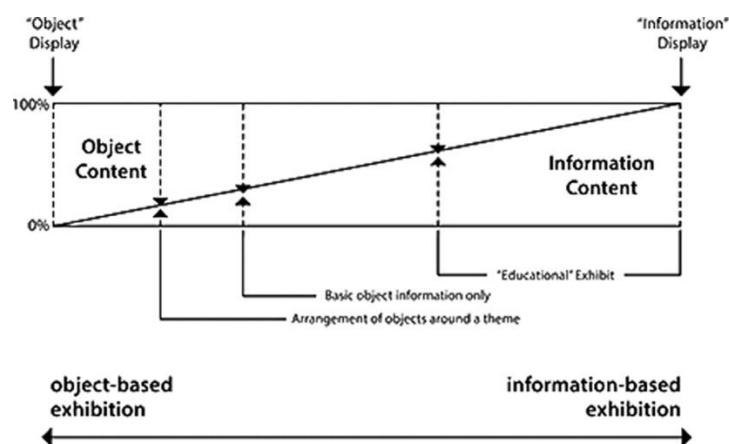
Figure 1 Veerhar and Meeter's Project Model Exhibitions

The traditional functions of the museum include collecting, researching, translating, documenting, preserving, and exhibiting artefacts. Nevertheless, as technology advances, the museum's role has changed considerably. The museum concept has also shifted from object-oriented, focusing more on enjoyment in services, to information delivery, focusing on enjoyment and edutainment. Meanwhile, the intent or purpose lies with the exhibit makers

whose exhibitions can range from being object-oriented at one extreme to concept-oriented at the other, with either objects or messages predominating, as illustrated in Figure 1. which depicts the Verhaar and Meeter's Project Model Exhibitions. Museums must figure out ways to display exhibits, including exploiting advanced technologies to communicate meanings with the audience through an exhibition design (Hooper-Greenhill, 1994). Accordingly, the exhibition designer team's vital role includes concentrating on the exhibition's narrative. However, to design an educational and entertaining meaningful experience, curators need to consider the elements of collaboration in museum exhibition design. Three vital elements for creating a successful museum exhibition design must be considered, including physical, intellectual, and emotional elements, as demonstrated in Figure 2.
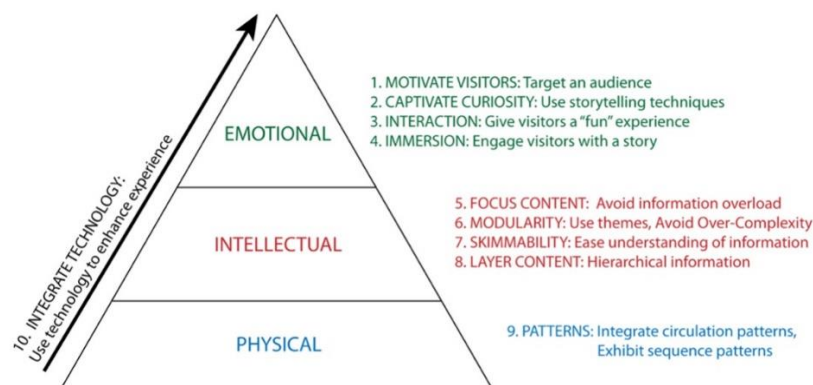

Figure 2 A successful museum exhibit design (Carliner, 2003)

Literature Reviews
Definition of digital storytelling (DST)

In the development of digital systems, the word "digital storytelling" (DST) is commonly used to cover a wide variety of tales, including films, books, and novels (Miller, 2019; Ohler, 2013; Schafer, 2008). As a result of the extensive overuse of the phrase, its definition has become unclear. Ohler (2013) claims that DST uses personal digital technology to integrate various media into a cohesive narrative. Additionally, Schäfer (2008) stated that DST is telling stories using digital media, such as digital images or sounds, and software that supports or even creates stories. Computer graphics, virtual environments, virtual humans, behavioural animation, theatre, play, story writing, knowledge management, psychology, and semiotics are all combined and shared in digital storytelling. According to Miller (2019), digital storytelling is narrative entertainment that reaches the audience through digital technology and media. Furthermore, digital storytelling techniques can pull a dry or complex subject to life and engage viewers.

Digital stories can be created using a variety of media and for a variety of reasons, according to a 2013 Ohio State University report. In the same year, the University of Houstan asserts that DST is the practice of using computer-based tools to tell stories at its most fundamental level. Digital documentaries, computer-based narratives, electronic memoirs, digital essays, interactive storytelling, and a host of other terms are also used to refer to this practice. However, they all generally refer to the practice of fusing the art of storytelling with various forms of multimedia, such as graphics, audio, video, and Web publishing. It is a contemporary interpretation of the age-old craft of storytelling. Throughout history, storytelling has always been used to transmit knowledge, understanding, and values. From

the campfire circle to the silver screen and now the computer screen, stories have evolved into many different forms and adapted to each new medium created.

Digital storytelling trends from 2016 - 2020 in cultural heritage

This section includes examples of museums utilising digital storytelling (DST) to promote cultural heritage between 2012 and 2020. This literature review aims to provide an overview of existing online museums that use DST techniques and highlight each medium's characteristics, benefits, and limitations.

Personalize Application and Educational Tools

Pujol et al (2012) developed this project to personalise museums' content to create customised narratives. Users must check in and complete a questionnaire to determine visitors' preferences and areas of interest. Each user's input is then personalised to create an interactive narrative experience. The project is intended for two types of end users: visitors who will access and interact with the system's information via their mobile phones and authors who will use the application to create stories. As in educational tools, Robin (2016) described resources for learning the methods to integrate digital storytelling into various instructional activities and discussed how digital storytelling (DST) had been utilised to support teaching and learning. Digital storytelling is an effective technology tool that can be utilised in various settings, including schools, museums, community groups, and hospitals. As DST evolves, more individuals, organisations, and groups are expected to use it in classroom activities.

Digital Storytelling Guidelines for Cultural Heritage

(Kasemsarn & Nickpour, 2016) conducted a study on the use of digital storytelling to promote tourism with the objectives of (a) developing a new conceptual framework for inclusive digital storytelling; (b) proposing a link between digital storytelling, inclusive design, and cultural tourism; and (c) providing the tourism industry with an understanding of emerging trends in cultural tourism. The analysis revealed that DST could increase the motivation for cultural tourism in Thailand. According to Rizvic et al (2017), visitors need more patience to read lengthy texts or watch protracted videos. There are also online applications that present the content as a series of short stories, allowing the visitors to choose the intensity they wish to delve into with specific information. Nonetheless, there is only a one-size-fits-all solution for some possible presentation contexts. Interestingly, the study has successfully established guidelines for interactive digital storytelling (IDS) presentation. (IDS).

According to Vrettakis et al (2019), storytelling has the potential to improve the way we engage with cultural heritage. A solution was presented for a situation in which there need to be more experts to create digital storytelling to aid in the creative process. The tool has proven helpful for effectively designing and developing a wide range of digital mobile experiences. Traditional museum exhibition and communication approaches have sparked growing concern in recent years. Museums have lost their ability to be critical institutions in a society that values cultural heritage. According to Falk (2019), only some museum visitors benefit from the so-called one-size-fits-all experiences. Falk's research combines DST and gamification to improve future museum experiences for teenagers. To improve the visitor experience at the facility, curators and the museum developed a set of guidelines.

Methodology

This study employs a qualitative approach. A contextual document analysis is a method for assessing and analysing all literature review pertinent to a certain research question, topic, or phenomenon of interest. A contextual analysis is the study of any text format. It includes multimedia that helps us judge it in the context of its historical and cultural setting and the textuality or the characteristics that make it a text. This type of analysis is concise and can be considered a textual analysis (Behrendt, 2008). The purpose of this method in this research is to summarise the most recent literature on digital storytelling (DST) approaches centred on cultural heritage. In addition, offering a framework or background to correctly put new research aims and summarises the gaps in current research to suggest areas for further investigation. This study intends to clarify the variables involved in integrating DST in museum exhibitions from the perspective of museum curators.

Finding
Practical and Theoretical Significance

Curators are the designers of the processes used to answer curatorial questions, and the curator's voice influences an exhibition's overall design and layout (Tane, 2013). Hence, it is essential to understand the level of curator's design knowledge to suit the planning and designing process in Malaysia's museums towards a new guideline for multimedia presentation exhibitions. This study is mainly significant and influential towards enhancing the museum's traditional aspects by incorporating digital elements. It would reinforce the museum's relevance while providing a new experience for Malaysian museum visitors. The adoption of digital storytelling has multiple effects; firstly, it broadens communication; secondly, the historical events or exhibits come alive, and participants develop a closer understanding of the past (Pujol et al., 2012). Thirdly, digital storytelling creates more profound emotional links than intellectual understanding (Springer et al., 2004).

Establishing a new practice guideline that includes essential steps for curators to follow in designing multimedia presentations at museums will not only facilitate the work of curators and designers in the design process but will also aid in developing digital storytelling (DST). In addition, other countries are working toward the Sustainable Development Goal (SDG) 4, titled "Quality Education," which was established by the United Nations. The enhancement efforts progress toward providing a more active future learning environment. It is already the scenario that many museum programmes are aligned with the Sustainable Development Goals (SDGs), and museums reach many people for formal and informal learning. They increase the number of people who are interested in, concerned about, and able to address issues related to Sustainable Development Goals (SDGs). The public's education and engagement in the Sustainable Development Goals (SDGs) can be significantly improved through the work of museums. In the form of collections and the knowledge associated with them, museums are responsible for preserving cultural and natural heritage. These serve as the foundation for a wide variety of learning and research programmes that can support the Sustainable Development Goals and preserve cultural and natural heritage outside of museums (McGhie, 2019). The study findings will improve the learning methods of visitors and inject new experiences into the operations of future museums. For visitors to the museum to have a more meaningful experience, museum curators ought to give some thought to improving the multimedia presentation and exhibition by focusing on historical event perspectives.

Digital Storytelling Elements and Process Guidelines for Museum Exhibition
In western museum exhibitions, digital storytelling (DST), where all content is presented digitally, is a significant and prevalent trend (i.e., digital mobile devices, smartphones, interactive systems, laptops, and computers). Concerns about the curators' process of creating the Malaysian museum exhibition on a digital platform, especially with the knowledge of DST or not, are raised since there are currently no guidelines for DST with a focus on cultural tourism (Kittachai & Nickpour, 2016). The design of a museum exhibition is a sequential process, and the curator requires additional skills and knowledge to make it more successful (Lin, 2003). These skills and knowledge will aid the curator in achieving the design process' goals (Dean, 2015; Kamaruddin, 2019). Consequently, this is an opportunity to use the DST design process and elements to understand the curators better, direct the team, and assist them in designing museum exhibitions on the digital platform (Lin, 2003). Any educational setting or cultural heritage endeavour could adopt this. The curators in Malaysian museums also need to be investigated and understood since their application tends to be educational (Tenh et al., 2012). In order to comprehend the perspective of curators in Malaysian museums, this study, therefore, adopts the concept of designing a DST process and elements.

Opportunities for Digital Storytelling (DST) Elements and Process Guidelines
Facilitate Curator and Commercialization
Few studies have been done on digital storytelling (DST) on digital platforms, particularly in museum exhibitions. The iterative design, development, and assessment of a mobile DST experience revealed helpful information about DST's efficacy for implementation in museums in the future (Katifori et al., 2020). By implementing guidelines for DST processes and elements while identifying the curators' needs and knowledge, new guidelines for digital content could be developed. (Vrettakis et al., 2019) for example, the web based Narralive Storyboard Editor and the Narralive Mobile Player app were designed to facilitate the creative process and promote research on various aspects of mobile DST applications in cultural heritage settings. Its other goal is to facilitate the design process for curators.

Engaging Digital Content
The use of rich multimedia content has presented significant challenges. While the integration of these technologies can improve museum visitors' learning experiences, digital media can be used as an engagement tool, and the narrative approach helps maintain the momentum needed in order for a visitor to gain a thorough understanding of the museum exhibition's flow (Wolff et al., 2012). It can also enhance visitors' experiences by allowing them to become involved in the storylines of the exhibits while engaging in personal reflections and interpretations (Tsiviltidou, 2015). As a result of contemporary trends in cultural heritage museums, the use of DST in museum exhibitions has increased globally (Fischnaller, 2018; Katifori et al., 2020; Micoli et al., 2019; Rammos & Bratitsis, 2020; Rizvic et al., 2020; Sylaiou & Dafiotis, 2020). Furthermore, the digital presentation of museum exhibitions should be improved, particularly in Malaysia. It is necessary to improve understanding of the exhibition's intent and presentation by integrating technology between the art of traditional storytelling and multimedia elements. Through that, it is executed to create a unique interpretation through images, graphics, music, video, and audio (Porter, 2004; Robin, 2016).

Synthesis of the Initial Framework

In order to identify relationships, gaps, problems, and opportunities, studies in related areas of the museum exhibition design process and elements of digital storytelling (DST) were analysed. The analysis of the development process of designing a museum exhibition revealed two significant issues: the curators' need for more understanding of DST and specific guidelines on digital multimedia exhibitions. The DST elements and process are used in this study to investigate the curators' understanding of their digital multimedia content development in the museum. The investigation is due to the need for more understanding of curators in designing digital multimedia content in the museum exhibition. The digital storytelling (DST) elements and processes mentioned and adopted by the curators are identified to guide and improve the flow and process of designing digital multimedia content. In the literature review, no specific guidelines focus on digital multimedia exhibitions. Furthermore, based on the literature review and analysis, a framework for the DST process and elements for curators in Malaysia has been developed from the literature review and is depicted in Figure 3.

Figure 3 A conceptual framework of a guideline of digital storytelling (DST) to facilitate the design process and engage the exhibition in a Malaysian museum through a curator perspective

Motivation and Contribution on this Study

The main objective of this study is to solve an issue caused from a research gap and problem statement on the improvement of the learning approach. Specifically, this study aims to engage museum visitors through the digital storytelling (DST) method. It may facilitate the curators in the development of the museum exhibition. This work contributes to SDG 4 Quality Education since it has the potential to improve the informal learning technique. In addition, a few innovations in educational tools can be produced, which will aid curators in creating a museum show that engages visitors.

Conclusion

Table 1

The synthesis of the digital storytelling (DST) usages, debates, and Malaysian context

The Trend of Digital Storytelling in Cultural Heritage	On Going Debates	With in Malaysian Context *Clearly an issue that needs to be investigate*
Utilizing in museums to promote cultural heritage as well as advantageous as a personalise application tool for visitor experiences in addition to educational tool in museums. It has been extensively developed in Western countries. Southeast Asia (Thailand) employed digital storytelling with a specific guideline to improve visitor motivation for cultural tourism. Afforadble multimedia for cultural heritage. Social interaction experiment.	Unable to properly integrate the digital approach to museum exhibition through storytelling. There are no explicit guidelines for digital storytelling for museum exhibition in Malaysia. The curators' perspectives as designers on creating a museum exhibition on a digital platform with a focus on storytelling.	Digital storytelling elements and process in educational and multiple fields that may suitable for cultural heritage usage. Curator's perspective on their understanding toward digital storytelling that utilised in Malaysian museum.

This paper aims to explore the significant and relationship of the usages of medium characteristics, benefits, and limitations of digital storytelling (DST) in cultural heritage as to develop a DST practical guideline for museum exhibitions. From the 'research gap' and phenomenon details described as shown in Malaysian context in Table 1, it is vital to implement the conceptual framework of digital storytelling (DST) for museum exhibition in order to facilitate curators in the design process for developing museum exhibitions that provide engaging exhibitions for museum visitors. This research is vital and significant since it has both practical and theoretical relevance. It is important to understand the medium characteristics, benefits, and limitations of digital storytelling (DST) in cultural heritage that may apply to museum exhibitions in Malaysia. This study's findings discussed the practical and theoretical importance of digital storytelling (DST) guidelines utilised by western museums. In addition, the options presented by the DST guideline include findings of proposing the conceptual framework and it may benefit curators in commercialising the museum exhibition and attracting visitors to the museum's digital content. On a conceptual framework, each finding was presented and for future research.

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