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# **A Contextual Document Review on the Digital Storytelling Process for Museum Exhibition**

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### **Abstract**

Digital Storytelling (DST) is a method of presenting information to an audience using narrative and digital media elements. However, no evidence defined digital storytelling (DST) being employed in Malaysian museums or cultural tourism exhibitions. This research aims to establish a new digital storytelling process for Malaysian museum exhibitions. Six DST models from various established experts were analysed using MAXQDA 2020 through a content analysis method. As a result, the workshop, pre-production, development, post-production, and dissemination processes of digital storytelling were established.

**Keywords:** Digital Storytelling; Museum Exhibition; Process

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### **1.0 Introduction**

The late Dana Atchley introduced the transition from traditional storytelling to digital storytelling (DST) as the digital story pioneer in collaboration with Joe Lambert in augmenting multimedia technology into the traditional story (Carolyn Handler Miller, 2019). Based on the combination of text, graphics or sketches, and audio such as musical instruments, the narrative is delivered efficiently and memorably to foster communication, collaboration, and creativity skills (Carolyn Handler Miller, 2019; Lambert & Hessler, 2018). Therefore, the role of the curator is to enhance the visitor's experience through digital storytelling applications as they can explore the virtual exhibition through the artefacts guided by digital stories Rizvic et al. (2020).

In addition, the emergence of digital storytelling (DST) in the museum exhibition will ease the process of digital storytelling (DST) creation for a low-cost budget on the museum tools (Negrini & Di Blas, 2015). Digital storytelling (DST) is employed in the museum field, whether in instructional media as the courseware or presentation. Storytelling has the potential to transform our connection with cultural heritage and is widely recognised as a significant element of attracting the most discerning audience for museums and other cultural heritage institutions (Bedford, 2001; Fisher et al., 2008; Pujol et al., 2013). It is also a user-centred approach in museums and cultural heritage (Pujol et al., 2013).

Furthermore, the aim of this study is to propose a single guide process in creating digital storytelling (DST) for museum exhibition creation. The objective of the study is to identify the most core processes of digital storytelling (DST) that represent among established experts and researchers that are suitable for museum multimedia presentation exhibitions. Next section will introduce some backgrounds

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of digital storytelling (DST) and its benefits in creating multimedia materials. The data analysis retrieved using MAXQDA, the qualitative research tool, via content analysis from a broad range of experts and scholars was described in extensive detail. The section on the study's findings concludes with a compilation of statistics pertaining to the most common use of the method. The final section summaries and summaries the study conducted.

## 2.0 Literature Review

With the combination of storytelling and multimedia elements such as graphics, text, audio, video, narration, and music, digital storytelling (DST) presents interesting information for specific topics (Porter, 2004). The digital narrative should be delivered effectively and infused with multimedia elements: narrative-generated videos with images, music, sounds, and animations (Lambert & Hessler, 2018). Thus, the diversely different opinions of experts on digital storytelling (DST) have led to various forms of stories being produced. Precisely, digital storytelling (DST) is grouped into three categories based on its content: i) personal narratives, (ii) historical events, and (iii) stories primarily designed to enlighten or instruct (Abdel-Hack & Hamid Ahmed Helwa, 2014; Robin, 2008). This study focuses on the narrative to inform or instruct stories as it involves the creation of multimedia learning materials.

The application of multimedia technology in the museum is practically usable for visitors to connect with collections in personally meaningful ways and increases their interest in the objects (Fisher et al., 2008). This way, the users can learn about the context of the displayed objects and be motivated to explore them through entertainment. They can be accomplished by implementing an innovative strategy through the process of multimedia material creation. In principle, the multimedia material creation process comprises three phases: pre-production, production, and post-production. However, J. Ohler (2013) claimed four phases in the DST process: pre-production, production, post-production, and distribution. Most of the steps in each phase of the multimedia creation process are similar to digital storytelling (DST) except for the varied description. For the curator or designers to create a compelling digital story, experts introduce sets of processes. Nevertheless, the experts suggest varieties of processes to guide them, of which some are redundant.

There are sets of processes introduced by experts to guide designers during digital storytelling (DST). Most digital storytelling (DST) processes involve the distribution phase because the story creation aims to reflect and share stories (Carolyn Handler Miller, 2019; Lambert & Hessler, 2018; Ohler, 2013; Porter, 2004; Publishing et al., 2011; Robin, 2008). Some experts, in turn, preserved the three-phase DST process: pre-production, production, and post-production, including steps such as creating story ideas, creating scripts, collecting media materials, importing and editing media with voice, audio, and images (Adams et al., 2008; Meadows, 2003; Midge Frazel, 2010). In addition, (Hartley & McWilliam, 2009) stated on Sara Kajder and team steps contains i) planning and setup ii) write an initial script iii) plan an accompanying storyboard iv) discuss and revise script, sequence the images in video-editing software, add narrative track, add special effects and add music v) post-production and distribution. Only a few experts include creating storyboards as a crucial step as illustrating story occurs during the creation of storyboards (Carolyn Handler Miller, 2019; Hartley & McWilliam, 2009; Ohler, 2013). Meanwhile, Ohler (2013) offered more detailed steps, which involved the planning phase, technical aspects, media and communication integration. Therefore, this study proposes a comprehensive process by complementing the technical aspects and narration content so that the designers can easily follow it. Conflicting views that arise between experts on the creation of digital storytelling (DST) lead to a single guide of the digital storytelling (DST) process.

## 3.0 Research Methodology

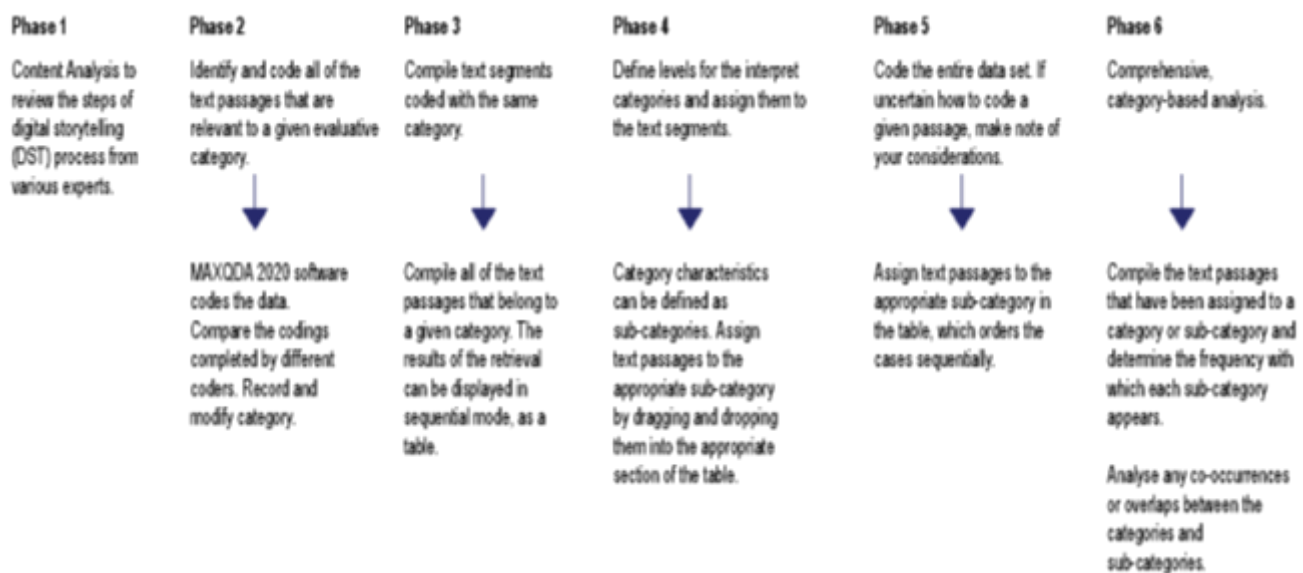


Figure 1: Summary of Method

In proposing the desired process, this research is implemented in qualitative text analysis using computer assistance MAXQDA, the qualitative research tool software in six phases, as shown in Figure 1. In the first phase, six out of fourteen literature books, dissertations, and journals related to digital storytelling (DST) models are reviewed based on various experts' digital storytelling (DST) process through content analysis utilising MAXQDA software. These sources include digital storytelling (DST) models. The selected literature that related with the digital storytelling (DST) process comprised the majority of the content in the remaining six literatures. The second phase involves identifying and coding all the text to the relevant categories. Subsequently, the third phase will have all text segments coded and compiled according to the same category and assembled in a table. The fourth phase will define the levels for interpretation on each category and assign them to text segments. Then, in the fifth phase, all codes are compiled into a set with sub-categories. Finally, the sixth phase compiles all the text-based categories and sub-categories, including determining the frequency with analysis for overlaps between categories and sub-categories.

#### 4.0 Findings and Discussions

Based on numerous processes established by different experts and scholars, the process list was then categorised into keywords. For instance, the digital storytelling process suggested by Lambert and Hessler (2018) serves the same meaning as emphasised by (Ohler 2013; Robin, 2008). Thus, a common keyword that was widely used and identified has been applied to encompass both terms. A content analysis of six works of literature on digital storytelling (DST) and representation of each expert and scholar has established the digital storytelling process. Producing digital storytelling (DST) has resulted in various perspectives from experts and has led to various forms of stories. Various types of stories generated by a digital storytelling (DST) process were categorised using the MAXQDA 2020 data analysis software. The outcome of the data analysis was discovered to be six out of fourteen expert viewpoints about the process, as shown in Table 4.1.

The most process employed in digital storytelling (DST) established by international scholars is frequently outlined and identified. As shown in Table Figure 2, there were six most frequent digital storytelling processes (DST) identified based on scholars with their frequency occurring derived from the content analysis of the key texts. From the categorisation process in MAXQDA 2020, the most frequent digital storytelling (DST) processes are workshop, pre-production, development, post-production, and distribution. Details pertaining to the process characteristics are outlined in the following sections.

##### 4.1 Workshop Phase of Digital Storytelling Process

In the content analysis throughout the literature, the 'workshop phase' was the most frequently occurring and most cited as an important process in planning effective digital storytelling (DST). Lambert and Hessler (2018) mentioned that the 'classic' model promoted by the Center for Digital Storytelling in Berkeley, California (CDS) consists of a facilitator-led workshop, usually over three days. It starts with the 'introduction' process as a briefing platform for participants or video creators to understand the entire process of digital storytelling (DST). It continues to the 'story circle' when participants can find their stories, share them, and develop them. Furthermore, along with other participants in a safe space, then producing, with the help of one or more facilitators, a two or three-minute audio-visual story using readily available rather than professional media software. The 'story circle' aims to enable the group to get to know one another and build trust. Besides that, create a relaxed, trusting atmosphere through storytelling exercises to give people the confidence to tell their own story and give people the tools to turn their personal story into a script. It has been emphasised that processes such as development, story planning phase, planning and setup and define, collect and decide had similar characteristics as to start a digital story from the author's life that serves as the basis for a captivating story question, it defines the story question and shapes the narrative (Carolyn Handler Miller, 2019; Hartley & McWilliam, 2009; Ohler, 2013; Robin, 2008). It is established that the process of 'workshop' is the most cited by scholars and considered important as it contributes towards the overall process of digital storytelling (DST) familiarity in experiencing the multimedia content.

##### 4.2 Preproduction Phase of Digital Storytelling Process

The process of 'pre-production', like some text, is the second most frequently occurring in majority digital storytelling (DST) steps. This process functions to define their audience and determine the final product, such as video or podcast, and how it will be presented in class, multimedia content, or posted to the web. They organise preliminary materials and plan for the digital storytelling project. This process was similar to a few processes from a scholar, such as planning and setup, planning storyboard, discussion, and revising script (Hartley & McWilliam, 2009; Midge Frazel, 2010) mentioned the preparation stage. Ohler (2013) had the same characteristics in the story planning and pre-production phase and (Robin, 2008) defined, collected, and decision process. Almost all the six scholars ascertain the process of 'pre-production' in a different term with similar steps. As Midge Frazel (2010) suggests, during the preparation stage, the development and processes of good writing should be highlighted and addressed in any event, as this process will inform the storyboard's development. The previous statement is also supported by Hartley and McWilliam (2009) and Ohler (2013) were writing an initial script that highlighted the story development process and finalisation of the story. Overall, the pre-production process was found significant in contributing towards the flow of importance or focus of the story development process as a good storyline.

##### 4.3 Development Phase of Digital Storytelling Process

The third most frequently occurring process is the 'development phase', this phase of the work is also known as the pre-production period (Ohler, 2013). The tasks during the development period are producing design documents, artwork, and other materials, building a prototype, and doing testing. Not every task conducted throughout this timeframe is related explicitly to creative issues.

However, everything, including the preparation of budgets and schedules and the development of marketing plans, usually impacts the content (Carolyn Handler Miller, 2019). The process has similarities in Hartley and McWilliam (2009) through sequences of images by video

editing, adding on narrative track, special effects, and music. Midge Frazel (2010) suggests that it occurs during the 'production phase,' when all the story's media elements are brought together and rendered into a video format (movie) or an audio format such as a podcast. Robin (2008) categorises it into two sections. The first section process is to decide, write, record, and finalise. The second section is the select, import, and create. Concisely, most scholars and experts mentioned the same characteristics, the lengthy process in digital storytelling (DST).

Table 4.1: Summary of Frequently Occurring Process of Digital Storytelling in the literature by experts and scholars (by keyword)

No	Text	Expert	DST Process	Characteristics
1	Digital Storytelling: Capturing Lives, Creating Community (2018).	Joe Lambert & Brooke Hessler	Introduction	<ul style="list-style-type: none"> <li>• Workshop enrollment or planning</li> <li>• Planning some idea of a story</li> <li>• Script preparation</li> </ul>
			Workshop	<ul style="list-style-type: none"> <li>• The seven steps briefing</li> <li>• Clear up concerns about story development</li> <li>• Aesthetic planning</li> <li>• Guidance of expert or facilitator</li> <li>• Inspiring session to motivate storyteller</li> </ul>
			The Story Circle	<ul style="list-style-type: none"> <li>• Group brainstorming</li> <li>• Storyteller presenting ideas</li> <li>• Draft script</li> <li>• Topic Clarification</li> <li>• Preserving storyteller</li> <li>• Story discussion</li> <li>• Time management</li> <li>• Improve feedback</li> <li>• Sharing experience on storyteller</li> <li>• Support system</li> </ul>
			Script Review and Initial Image Work	<ul style="list-style-type: none"> <li>• Create initial draft writing</li> <li>• Language editing</li> </ul>
2	Story Circle: Digital Storytelling Around the World (2009).	Sara Kadjer	Planning and Setup	<ul style="list-style-type: none"> <li>• Buy equipment</li> <li>• Install software</li> <li>• Recruit storytellers</li> <li>• Identify computer lab</li> <li>• Workshop preparation</li> </ul>
			Write an initial script	<ul style="list-style-type: none"> <li>• Teach story generation</li> <li>• Teach story structure</li> <li>• Find model stories to show. Teach personal writing</li> <li>• Help low-literacy writers write</li> <li>• Negotiate cultural and language differences</li> </ul>
			Plan an accompanying storyboard	<ul style="list-style-type: none"> <li>• Teach story generation</li> <li>• Teach story structure</li> <li>• Find model stories to show. Teach personal writing</li> <li>• Help low-literacy writers write</li> <li>• Negotiate cultural and language differences</li> </ul>
			Discuss and revise script	<ul style="list-style-type: none"> <li>• Create a comfortable writing workshop</li> <li>• Give group and individual writing feedback</li> <li>• Negotiate difficult personal issues</li> </ul>
			Sequence the images in video-editing software	<ul style="list-style-type: none"> <li>• Teach video-editing software</li> <li>• Troubleshoot video-editing software</li> <li>• Record audio</li> <li>• Edit audio</li> <li>• Enforce deadlines</li> </ul>
			Add the narrative track	
			Add special effects	
			Add music	
Post-production and distribution	<ul style="list-style-type: none"> <li>• Post-produce video. Compress files</li> <li>• Prepare CDs and DVDs</li> <li>• Distribute stories via the Web</li> </ul>			
3	Digital Storytelling: Guide for Educators (2010)	Midge Frazel	Preparation Stage	<ul style="list-style-type: none"> <li>• Prepare Narration</li> <li>• Write Script</li> <li>• Create Timeline</li> <li>• Create Story Map</li> <li>• Determine Audience</li> </ul>
			Production Stage	<ul style="list-style-type: none"> <li>• Archive on CD or DVD</li> <li>• Conduct Peer Review</li> <li>• Apply Special Effect</li> <li>• Render Video</li> <li>• Apply Transition</li> <li>• Create Slide Show</li> <li>• Create Video</li> <li>• Create Images</li> <li>• Create Sound Effect</li> <li>• Create Music</li> </ul>
			Presentation Stage	<ul style="list-style-type: none"> <li>• Post on Web</li> </ul>

Table 4.1 (contd) : Summary of Frequently Occurring Process of Digital Storytelling in the literature by experts and scholars (by keyword)

No	Text	Expert	DST Process	Characteristics
4	Digital Storytelling: A Powerful Technology Tool for the 21st Century Classroom (2008).	Bernard Ross Robin	Define, Collect and Decide	<ul style="list-style-type: none"> <li>• Purpose of Story</li> <li>• Information Content</li> <li>• Sound Effects</li> <li>• Voiceover</li> <li>• Locate Music</li> <li>• Search Images</li> <li>• Select a Topic</li> <li>• Store Materials</li> </ul>
			Select, Import and Create	<ul style="list-style-type: none"> <li>• Modify Images</li> <li>• Import Audio into Photo Story</li> <li>• Import Images into Photo Story</li> <li>• Select Content and Text</li> <li>• Select Audio</li> <li>• Select Images</li> </ul>
			Decide, Write, Record and Finalize	<ul style="list-style-type: none"> <li>• Finalize Your Story</li> <li>• Record the Narration into Photo Story</li> <li>• Write a Script</li> <li>• Decide on the Purpose and Point of View</li> </ul>
			Demonstrate, Evaluate and Replicate	<ul style="list-style-type: none"> <li>• Improve Story from Feedback</li> <li>• Peer Review</li> </ul>
5	Digital Storytelling: A Creator's Guide to Interactive Entertainment (2019)	Carolyn Handler Miller	Preproduction Phase	<ul style="list-style-type: none"> <li>• Concept Development</li> <li>• The Design Document</li> <li>• Dialogue Script</li> <li>• Narrative Flowchart</li> <li>• Concept Art</li> <li>• Storyboards</li> <li>• Character Sketch</li> <li>• Prototype</li> <li>• Interactive</li> </ul>
			Development Phase	<ul style="list-style-type: none"> <li>• Create Core Concept</li> <li>• Brainstorming Topic</li> <li>• Plan Medium and Platform</li> <li>• Quick Sketch</li> <li>• Draft Storyboard</li> <li>• Market Audience</li> <li>• Platform and Genre</li> <li>• Narration</li> <li>• Structure and Interface</li> <li>• Story Setting</li> <li>• User Engagement</li> <li>• Overall Look and Sound</li> </ul>
6	Digital Storytelling in the Classroom: New Media Pathways to Literacy, Learning and Creativity (2013).	Jason B. Ohler	Story Planning Phase	<ul style="list-style-type: none"> <li>• Plan Storyboards</li> <li>• Plan Story Tables</li> <li>• Plan Scripts</li> <li>• Plan Story Maps</li> </ul>
			Preproduction Phase	<ul style="list-style-type: none"> <li>• Get the Media</li> <li>• Create Media List</li> <li>• Script</li> <li>• Story Table</li> <li>• Story Map</li> </ul>
			Production Phase	<ul style="list-style-type: none"> <li>• Peer Review</li> <li>• Add Voices</li> <li>• Add Sound</li> <li>• Add Music</li> <li>• Rough Mix</li> </ul>
			Post-Production Phase	<ul style="list-style-type: none"> <li>• Store in CDs or DVD</li> <li>• Export Story</li> <li>• Peer Review</li> <li>• Add Background Music</li> <li>• Final Mix</li> <li>• Add Effects</li> <li>• Add Transitions</li> <li>• Add Music</li> <li>• Copyright Information</li> <li>• Add Credits</li> <li>• Add Titles</li> </ul>
			Performance and Distribution Phase	<ul style="list-style-type: none"> <li>• Sharing Your Story</li> </ul>

#### 4.4 Post-Production and Distribution Phase of Digital Storytelling Process

The fourth most frequently occurring process is the post-production and distribution phase. This process is all about presentation. The digital story should be saved onto a file-sharing site or archived onto a CD or DVD. The digital story is played for the classroom or posted on the web. According to all the texts identified in Hartley and McWilliam (2009), Lambert and Hessler (2018), Midge Frazel (2010), Ohler (2013), and Robin (2008), they had similarities in this process. All the scholars and experts mentioned that the post-production and

distribution phase show the digital story to peers to get feedback about how the story could be improved. Sharing digital stories through websites that allow users to upload files and create presentations online is one of the ways of distribution. However, the distribution phase is the difference in the digital storytelling (DST) process among experts. In this phase, audiences are allowed to improve and edit the story. In summary, most of the scholars and experts had the same perspective on post-production and distribution.

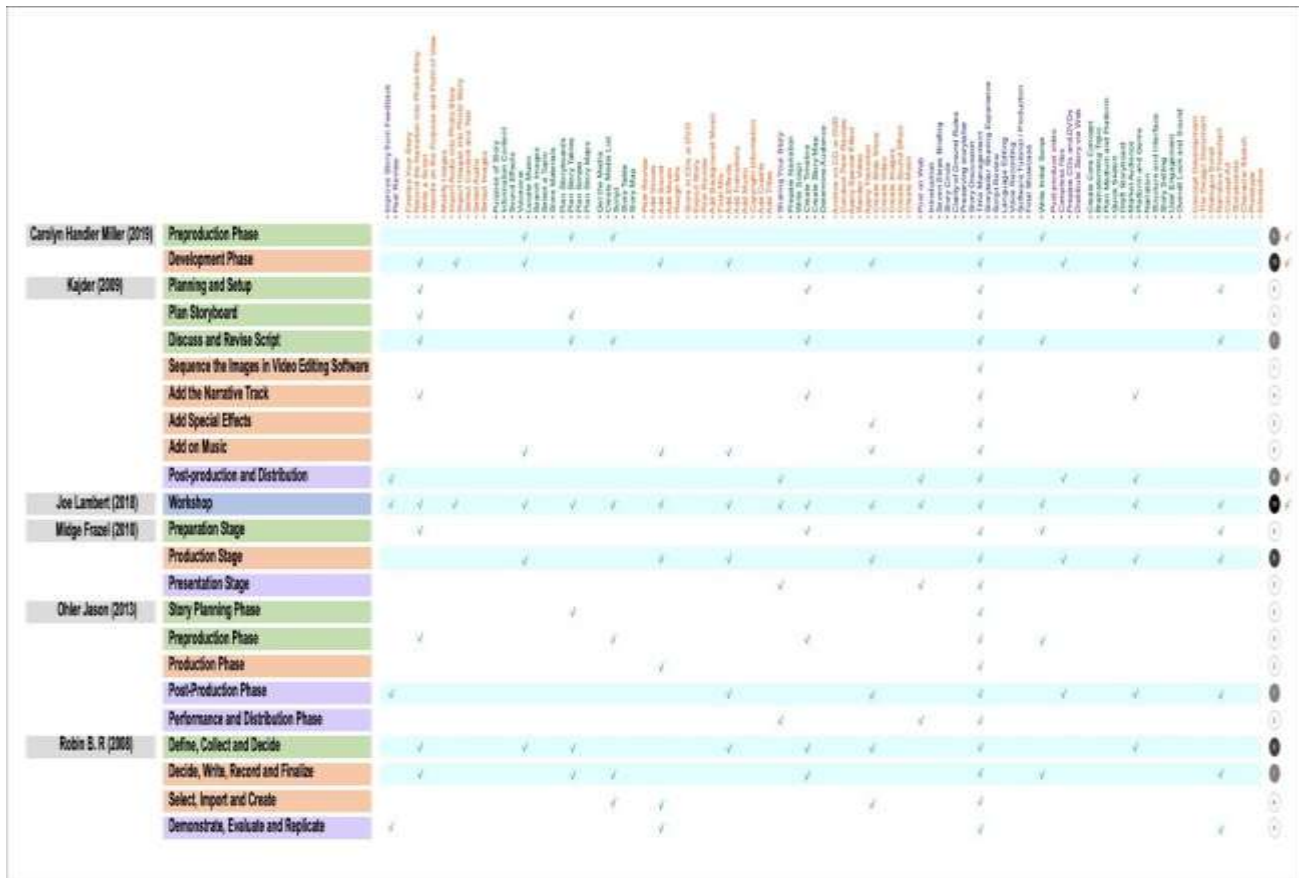


Figure 2: Most frequently occurring process of digital storytelling in the literature (by keyword)

#### 4.5 Finalise List of Digital Storytelling Process

Table 4.2: Most frequently occurring process of digital storytelling in the literature (by keyword)

No	DST Process	DST Sub-Process	Characteristics
1	Workshop	Workshop Briefing Session	<ul style="list-style-type: none"> <li>Briefing of Group Discussion, Preserving Storyteller, Time Management, Storyteller Sharing Experience, Script Review, Language Editing, Voice Recording, Software, Final Showcase.</li> </ul>
2	Preproduction Phase	The Concept and Planning	<ul style="list-style-type: none"> <li>Concept Development and Art</li> <li>Planning of Audience Determine, Design Project, Prototyping, Medium, Platform and Genre.</li> </ul>
		Narration and Visualisation	<ul style="list-style-type: none"> <li>Preparation of Narrative Elements.</li> <li>Script Writing</li> <li>Visualisation of Story and Flowchart</li> </ul>
		Timeline and Storyboard	<ul style="list-style-type: none"> <li>Creating Timeline</li> <li>Creating Storyboard and Story Map</li> <li>User Engagement</li> </ul>
3	Development Phase	Materials Selection and Importing	<ul style="list-style-type: none"> <li>Select Images, Audio, Content and Text</li> <li>Import Images and Audio</li> </ul>
		Story Creation	<ul style="list-style-type: none"> <li>Add on Voiceover, Effects, Transitions, Music and Background Music</li> <li>Copyright Information</li> </ul>
		Modification and Finalization	<ul style="list-style-type: none"> <li>Modify Images, Rough Mix, Peer Review, Add Titles, Add Credits and Final Mix</li> </ul>
4	Post-production and Distribution Phase	Publish and Sharing	<ul style="list-style-type: none"> <li>Export, Store, and Share Story</li> </ul>

According to the data in Table 4.2, there are four stages to digital storytelling (DST); the workshop, the pre-production phase, the development phase, and the post-production and distribution stages. It consists of four primary digital storytelling (DST) processes, each of which contains a subprocess from the main processes, which have been classified according to the theme of the process. It began with the workshop process and progressed to the pre-production phase, with a total of nineteen steps of the process that a curator must go through. Seventeen steps of the development process must be completed before moving on to the post-production and distribution phase. The digital storytelling (DST) method had been overly detailed and challenging to follow due to the lengthy list of steps. The following steps will combine two or more processes and break down the sub processes into more straightforward stages, as in Figure 3.

A combination of the exact procedures had been done from the finalised list of the digital storytelling (DST) process and characteristics recommended in the literature. The four basic processes have not changed, but the sub processes have been summarised after studying the lists of similar processes and can be combined into a single process. It begins with the first process, the 'workshop briefing session'. It continues with the second process, the 'pre-production phase', which contains three sub-process summaries of the previous nineteen subprocesses. The three sub processes are i) concept and planning; ii) narration and visualisation, and iii) timeline and storyboard. This process phase continues from the seventeen stages summarised into yet another three: i) materials selection and importing, ii) story creation and iii) modification and finalisation. The process continues to the development phase from the seventeen stages that have been summarised into three. Finally, the post-production and distribution phases were divided into two stages: publishing and sharing. Everything had been meticulously documented, with the specific qualities serving as a guide for the primary processes. Figure 3 depicts the finalised model of the digital storytelling (DST) process. Importantly, digital technologies improve curators' abilities in developing digital content which would be advantageous for educational purposes so that visitors could attain deeper understanding on the various aspects of culture and heritage.

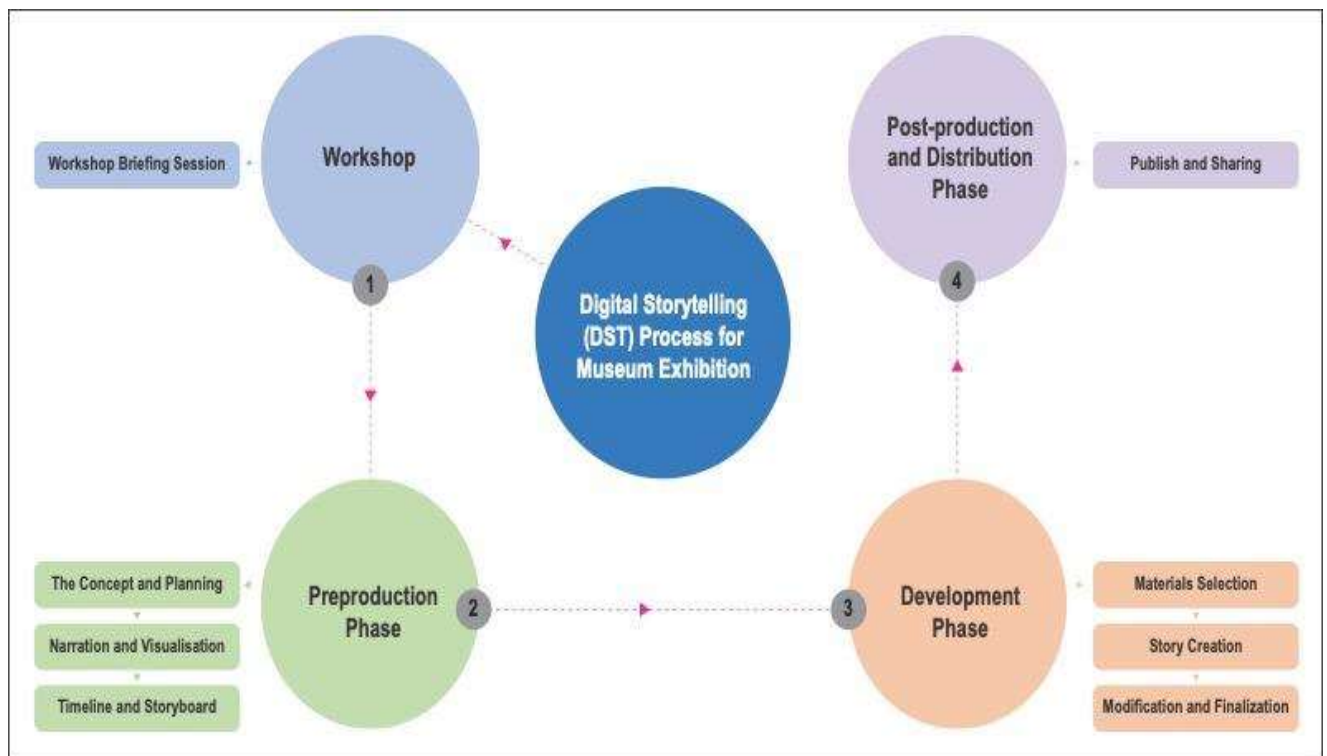


Figure 3: Finalised model of digital storytelling (DST) process

## 5.0 Conclusion

The research findings have revealed eight generic steps categorised into four major phases in the digital storytelling (DST) process. Expressing the ideas of a story is a fundamental step in the creation of DST. Thus, curators and designers should raise ideas that will embark on the creation of a story. The following steps in the digital storytelling (DST) process will guide the curators and designers to produce any multimedia material. However, the difference in the DST process compared to other existing multimedia processes is the distribution phase. In this phase, audiences are allowed to share the story. Besides that, the finding emphasises narrative, visualisation, and storyboard as it is essential to visualise the story flow. This finding is beneficial for reshaping the process of digital storytelling (DST) in accordance with various areas of expertise and experience in creating multimedia materials and the use of digital technologies. This study is limited to focusing only on the digital storytelling processes for museums but not on the technologies. Nevertheless, the processes can be adapted for other purposes which intent to utilise digital storytelling (DST). Hence, an extended research could be performed on identifying suitable technologies which could enhance presentations for DST. Furthermore, it can be recommended to all story creation on a non-interactive or interactive platform in the museum exhibition. Hence, the process is also helpful to guide curators and designers,

especially those unfamiliar with digital storytelling (DST). For further research, a detailed guideline is a reference for curators and designers to produce a museum exhibition that uses digital storytelling (DST).

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