CONCEPTUAL MODEL OF DIGITAL STORYTELLING (DST)

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Abstrak

Penceritaan digital (DST) merupakan evolusi kepada penceritaan tradisional, dengan memperkuatkan lagi kesan penceritaan melalui teknologi terkini. Bagi seseorang pencerita digital untuk menghasilkan sebuah cerita digital, terdapat pelbagai elemen yang perlu diikuti. Walau bagaimanapun, elemen yang dicadangkan oleh berbilang pakar adalah berbeza; ada yang berulang dan ada yang tidak memenuhi keperluan interaktiviti. Oleh itu, matlamat utama kajian ini adalah untuk mengenal pasti persamaan elemen daripada pakar yang berlainan bagi mengelakkan sebarang pertindihan elemen. Dengan berbuat demikian, kajian ini dapat mengenal pasti elemen teras DST dan dipersembahkan dalam bentuk model konseptual. Bagi mencapai matlamat utama kajian ini, empat sub-objektif dibentuk; (1) mengenal pasti elemen teras penceritaan digital yang mewakili DST jenis interaktif dan tidak interaktif, (2) membina satu model konseptual elemen teras DST yang telah dikenalpasti, (3) menilai model konseptual yang dicadangkan oleh pakar DST dan pengguna potensi. Empat fasa metodologi telah disusuli: (1) kerja asas, (2) induksi, (3) lelaran, dan (4) rumusan. Model konseptual telah ditinjau oleh lima pakar antarabangsa dan dinilai oleh 62 pengguna potensi. Penilaian kualiti yang dilakukan terhadap model tersebut merangkumi konstruk: Persepsi Kemudahfahaman, Persepsi Kebergunaan, Kepuasan Pengguna, dan Persepsi Kualiti Semantik. Dapatan penilaian menunjukkan bahawa responden beranggapan model konseptual tersebut berkualiti (skor purata 4.936 daripada skala 7.000). Ujian-T juga menunjukkan tiada perbezaan pendapat yang signifikan antara kumpulan yang berpengalaman membangunkan DST dengan yang tidak berpengalaman. Ini menunjukkan bahawa model konseptual yang terdiri daripada elemen teras DST, iaitu sumbangan utama kajian ini, mampu membimbing pencerita digital dalam membangunkan cerita digital.

Kata Kunci: Penceritaan digital, Model Konseptual, Persepsi Kemudahfahaman, Persepsi Kebergunaan, Kepuasan pengguna, Persepsi Kuantiti Semantik

Abstract

Digital storytelling (DST) is an evolution of the age-old traditional storytelling, by augmenting the power of storytelling via the latest technology. In order for a digital storyteller to construct a digital story, there are sets of guided elements to be followed. However, these experts-proposed elements vary; while some are repetitive others do not cater for interactivity. Therefore, the main aim of this study is to identify the commonality of the diverse elements used by the different experts to eliminate their redundancy. By doing so, this study can identify the DST core elements and present them in the form of a conceptual model. In achieving the main aim, three sub-objectives were constructed; (1) to identify the core elements of digital storytelling that represent interactive and non-interactive forms, (2) to construct a conceptual model of the identified DST core elements, (3) to evaluate the proposed conceptual model by DST experts and potential users. In ensuring that the study is guided and focused, four phases of methodology were followed through: (1) groundwork, (2) induction, (3) iteration, and (4) conclusion. Eventually, the conceptual model was reviewed by five international experts and evaluated by 62 potential users. The evaluation on the quality of the model encompassed the following constructs: Perceived Ease of Understanding, Perceived Usefulness, User Satisfaction, and Perceived Semantic Quality. The findings indicated that the respondents perceived the conceptual model as having quality (mean score of 4.936 over a scale of 7.000). T-Test also revealed that there is no significant difference between the perception of those with experience in developing DST and those without experience. This suggests that the conceptual model consisting of the DST core elements, which is the main contribution of the study, could guide digital storytellers in developing digital story.

Keywords: Digital storytelling, Conceptual Model, Perceived Ease of Understanding, Perceived Usefulness, User satisfaction, Perceived Semantic Quality

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List of Abbreviations

CDS	Center for Digital Storytelling
CLT	Cognitive Load Theory
CTML	Cognitive Theory of Multimedia Learning
DST	Digital Storytelling
ITM	Iterative Triangulation Methodology
PEOU	Perceived Ease of Understanding
PSQ	Perceived Semantic Quality
PU	Perceived Usefulness
SMS	Short Message Service
US	User Satisfaction

CHAPTER ONE
INTRODUCTION

1.1 Background of Study

Story is an important element in human's life. It is learning and teaching tool used to communicate, stir emotions, engage and entertain people to read to the end. According to Dudley (1997), storytelling is the art of storytellers to achieve the aforementioned purposes. Stories are told, heard, and responded to in order to convey and absorb messages or ideas (Grisham, 2006). For generations, stories are utilized as a tool to pass down knowledge and wisdom from parents to children. It started a long time ago informally as pictures on stone walls and has much evolved throughout history (Behmer, 2005).

In this modern day, stories have gone through a major makeover. Moreover, with the intervention of new technology and the appearance of multimedia with its rich media elements such as audio, video, animation, and graphic, stories have diversified from its traditional root without leaving its genuine purpose which is to educate and convey messages. Amalgamated with technology, storytelling has taken a new form with deeper impact in communicating ideas and knowledge sharing. The popular term coined for it is digital storytelling (DST), which has been affected by the technology fast pace evolution (Banaszewski, 2005; Lambert, 2006; Ohler, 2008; Robin, 2008). Long before the birth of technology, traditional storytelling is expressed in its most basic forms, which is oral, or written. However, the introduction of multimedia has changed the perspective of storytelling in a new way. DST combines the art of traditional storytelling with multimedia elements such as

images, graphics, music, video and audio in order to craft a personally voiced narrative (Porter, 2004; Robin, 2008).

The transition of DST from traditional to digital form was introduced by the late Atchleys (Lambert, 2006). He was a media producer and an artist in multi disciplines and through his multimedia autobiography called *Next Exit*, he collaborated with Lambert in utilizing multimedia technologies to turn the traditional story to digital. In 1994, Mullen joined both of them and together they founded the San Francisco Digital Media Center which later on became Center for Digital Storytelling (CDS) in 1998 (Center for Digital Storytelling, n.d.; Lambert, 2006). The main purpose of the Center is to foster the people with zero background in storytelling or media production to tell personal stories in digital form. The digital stories created would become their personal life's mementos and it can be shared with other people. CDS has become a point of reference to so many talented and potential storytellers and is frequently used as a starting point to work with digital stories. As time flies, more and more people started noticing the significance of digital storytelling's contribution in multiple contexts. As a consequence, more DST elements have been introduced into the domain and this act brings out the interest of the research which is elaborated more in the next section which is the problem statement.

1.2 Problem Statement

DST exists in many forms starting as short video and as it gains its momentum and breached many domains, other forms of DST bloomed such as interactive digital storytelling, web-based storytelling, and multiplayer role-playing games (Lambert, 2006). Though seemingly easy to construct, DST is more than meets the eyes. People make mistakes by thinking that equipping them with digital literacy is suffice to construct a digital story when in fact, story literacy is the priority in constructing a digital story (Ohler, 2008). As stated by Ohler (2008) in his book *Digital Storytelling in the Classroom*, digital story elements play important role in digital story construction. The elements provide the storytellers consideration in the construction process towards producing what is called good digital story (Lambert, 2006). There are several experts that proposed their own sets of elements namely Lambert (2006), Paul and Fiebich (2005), Porter (2004), Salpeter (2005), Robin (2008), Schafer (2008) and Ohler (2008). However, Schafer (2008) in her research stated that DST is a new area of research and there is no finite definition for its components and dimensions. This situation makes it difficult for a new digital storyteller or researcher to grasp the concept of DST without any clear definition. In her research, Schafer proposed a reference framework for DST which consists of two main connected models: an Abstract Layer Model and the Dimension Star. The Abstract Layer Model mirrors the level of complexity and different perspective in DST. The Dimension Star represents the characteristics or elements of DST that can be used to analyse and differentiate application in the DST domain. Each layer of Abstract Layer Model contains specific elements or dimensions as Schafer prefers to call, that constitute a digital story. The purpose of the Dimension Star is to provide the point

of reference to set apart different form of DST and to analyse the level of relevance of the elements in each layer to the digital story. Nevertheless, she also states that the elements defined in her model need to be improved and polished in term of its definition. She also suggests the enhancement of the Dimension Star by adding more elements for more thorough comparison and benchmarking of digital stories (Schafer, 2004). These two suggestions leave room for more questions to be answered. How can the dimensions or elements be refined and expanded? Has Schafer put into consideration of the elements by other experts when introducing her own DST elements? In her work, she focused more on interactive DST hence her model is incomplete because DST also exists in non-interactive form, such as a short video.

The elements proposed by Schafer as the finding of her research is an addition to the list of elements proposed by other experts before her as mentioned above. In order to refine and include more elements, other elements proposed by other experts have to be analysed and compared with Schafer's since she did not put into consideration of other experts' elements and DST form in proposing her DST elements. As shown in the Table 1.1, for instance, Paul and Fiebich (2005), proposed five elements (Media, Action, Relationship, Context, and Communication) for online news stories. These digital stories may consist of single media or multiple media. The second element (Action), describes the attribute of content movement and user action. The content could be static, dynamic or a mixture of both and some content needs user action to move the contents and some not. Relationship as the third element is between the digital stories and user. It is discussed based on linearity, customization, calculation,

level of manipulation and ability to append. Context of a story can be linked or standalone. Stories also can be linked in different techniques, purposes, and sources. The last element, Communication can occur in two ways or one way. In one-way communication, a user is unable to respond digitally to the stories presented, while in two-way communication, a user is able to reach out to the content developer or other users in various aspects and mode of communication. Also, Ohler (2008) describes DST as a coherent narrative produced by the combination of media using personal digital technology. He proposes DST elements for educational purpose to focus on emotional engagement, tone, spoken narrative, soundtrack music, role of video and performance, creativity and originality, time, story length and economy. Ohler further stresses that DST in the classroom is guided by its need in achieving academic aim and producing the stories in the form of short movie; two to four minutes only.

Some of the experts' set of elements show commonalities among each other. There are also elements that are isolated and incomparable against each other which raise a question whether they are really needed in the DST construction. This act of finding commonalities by comparing the elements of the experts will not only refine and expand the elements proposed by Schafer, but also will reveal the core elements of DST towards guiding the construction of DST. Additionally, based on the conducted literature review, the study has also identified and concluded that the DST, generally and the sets of elements, specifically, are actually divided into two categories which are interactive and non interactive DST. Based on Schafer (2008) statement that DST is lacking the definite definition, this study aspires to strengthen the definition of

DST by defining DST based on its two identified categories. Details of the definition are explicated in the Chapter 4.

Table 1.1: List of Experts and Elements of DST

EXPERTS						
Porter (2004)	**Salpeter (2005)**	**Paul & Fiebich (2005)**	**Lambert (2006)**	**Robin (2008)**	**Ohler (2008)**	**Schafer (2008)**
ELEMENTS						
▪ Living in your story ▪ Unfolding lessons learning ▪ Developing creative tension ▪ Economizing the story told ▪ Showing not telling ▪ Developing craftsmanship	▪ Personal ▪ Begin with the story or script ▪ Concise ▪ Use readily available source materials ▪ Include universal story elements ▪ Involve collaboration	▪Media ▪Action ▪Relationship ▪Context ▪Communication	▪ A point of view ▪ A dramatic question ▪ Emotional content ▪ The gift of your voice ▪ The power of the soundtrack ▪ Economy ▪ Pacing	▪ The overall purpose of the story ▪ The narrator's point of view ▪ A dramatic question or questions ▪ Quality of the images, video & other multimedia elements ▪ Use of a meaningful audio soundtrack ▪ The choice of content ▪ Pacing of the narrative ▪ Good grammar and language usage ▪ Economy of the story detail ▪ Clarity of voice	▪ Point of view ▪ Emotional engagement ▪ Tone ▪ Spoken narrative ▪ Soundtrack music ▪ Role of video and performance ▪ Creativity and originality ▪ Time, story length and economy	▪ Concreteness ▪ User contribution ▪ Coherence ▪ Continuity ▪ (Conceptual) Structure ▪ Stage ▪ Virtuality ▪ Spatiality ▪ Control ▪ Interactivity ▪ Collaboration ▪ Immersion

1.3 Research Gap

On close examination of the existing models by the eight DST researchers (Lambert, 2006; Ohler, 2008; Paul & Fiebich, 2005; Porter, 2004; Robin, 2008; Salpeter, 2005; Schafer, 2008), there is an apparent need to refine these models in order to produce a conceptual model which represents the combined core elements to support both interactive and non-interactive DST. By integrating the elements and removing its redundancy from the model based on the comparative study conducted on the sets of element, the aspiring digital storytellers would require a low cognitive load in order to comprehend the elements needed to construct DST (Moreno & Park, 2010).

DST elements provide invaluable guidance to aspiring digital storyteller in constructing a DST. Though the process of DST construction is dynamic and not prescribed (Lambert, 2006), the elements could assist transforming a typical digital story to a very memorable one. Schafer (2008) has done a good job in introducing a reference model of DST that includes dimensions or elements of DST. However, the elements cannot be considered as core because she inclines towards one form of DST which is the interactive form. This makes her model and elements incomplete because they do not represent the other significant half of DST which is the non-interactive form.

1.4 Research Question

In order to conduct the study, the following research questions were put forward:

a) What are the core elements of DST based on the comparison of the sets of element by different experts?

b) How can the core elements be represented visually as a conceptual model to support interactive and non-interactive DST?

c) How would the conceptual model be evaluated by DST experts and the potential users (digital storyteller)?

1.5 Research Aim and Objective

The main aim of this study is to propose a DST conceptual model to cater for interactive and non-interactive forms. In order to propose the DST conceptual model the following objectives are formed:

a) To identify the core elements of digital storytelling that represent interactive and non-interactive forms.

b) To construct a conceptual model of the identified DST core elements.

c) To evaluate the proposed conceptual model by DST experts and the potential users.

1.6 Theoretical Framework

In the process of constructing the conceptual model that represents the core elements of interactive and non-interactive DST, theories, models and concept have been used as supportive pillars to form the study's theoretical framework. The study introduces many elements that are deemed necessary in supporting the research gap and DST construction, and some of the elements are supported by different theories, models and concept. Therefore, there are a number of different theories, models and concept

that have been used but still they converged at the same focal point in supporting the elements as displayed in Figure 1.1.

As depicted in Figure 1.1, analysis of definitions, types, and elements of DST and also its implementation in different domains have been performed to support the gap identified and also to fortify the conceptual model development. It can be seen that the study uses Theory of Cognitive Load to explain the research gap identified as explained earlier in section 1.2.

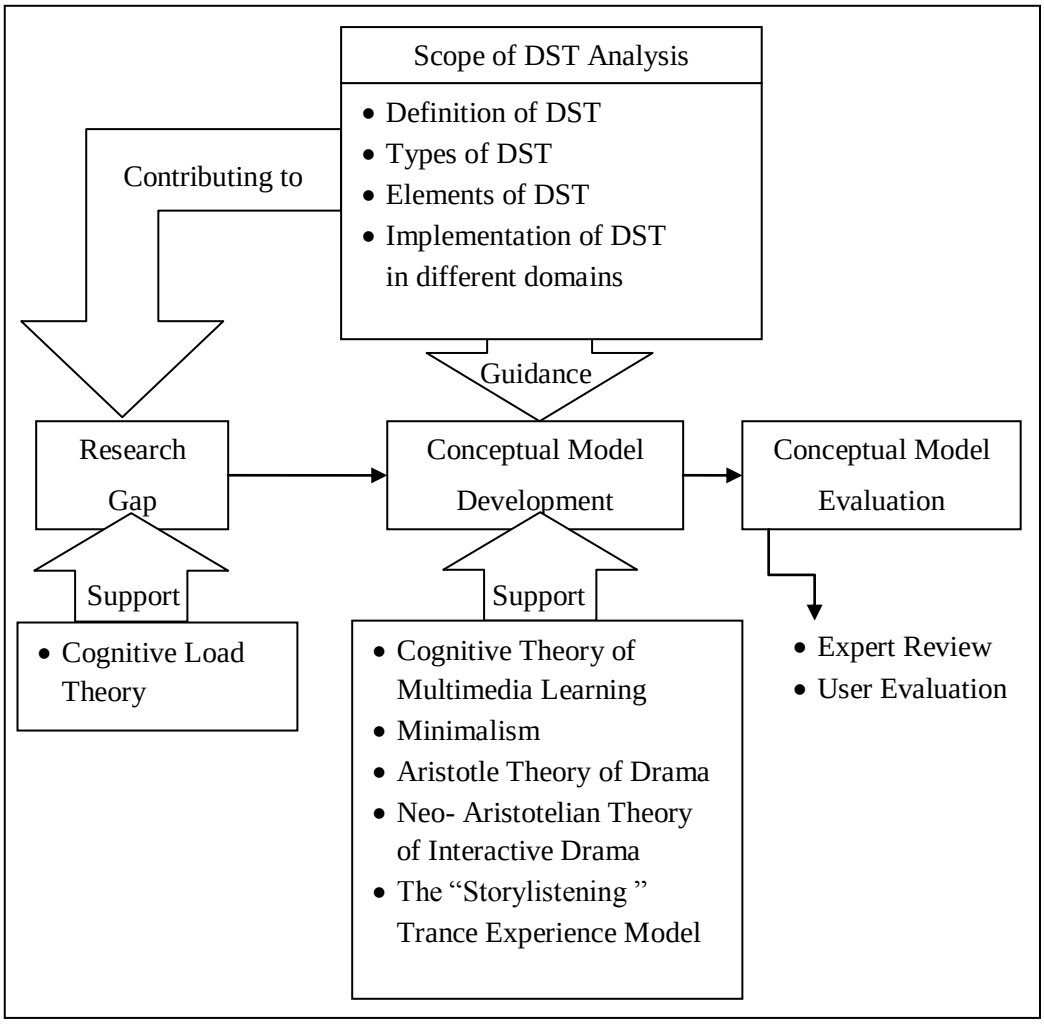


Figure 1.1: Theoretical Framework

As for the conceptual model, five theories and model were combined to support its development. The theories and model are Cognitive Theory of Multimedia Learning, Theory of Minimalism, Aristotle theory of Drama, Neo-Aristotelian theory of Interactive Drama, and Storylistening Trance Experience Model. The theoretical framework also shows the evaluation stage which is performed via expert review and user evaluation. Elaboration on the theories and model, and evaluation are further included in the upcoming Chapter 2 and 3.

1.7 Research Framework

In conducting the study, a research methodology called Iterative Triangulation Methodology by Lewis (1998) was adapted and it forms the study's research framework in order to organize and guide the research process. The research framework is depicted in Figure 1.2. The details of each phase are explained in Chapter 3.

As shown in Figure 1.2, the research framework is built in four phases which are the groundwork, induction, iteration and conclusion. The first phase is Groundwork. This phase is the fundamental process of exploring DST. It consists of two main activities: review literature and gather cases. Literature gathered is reviewed to identify the research gap and focus of the research. The existing models available have also been discovered as cases to be analysed in the study.

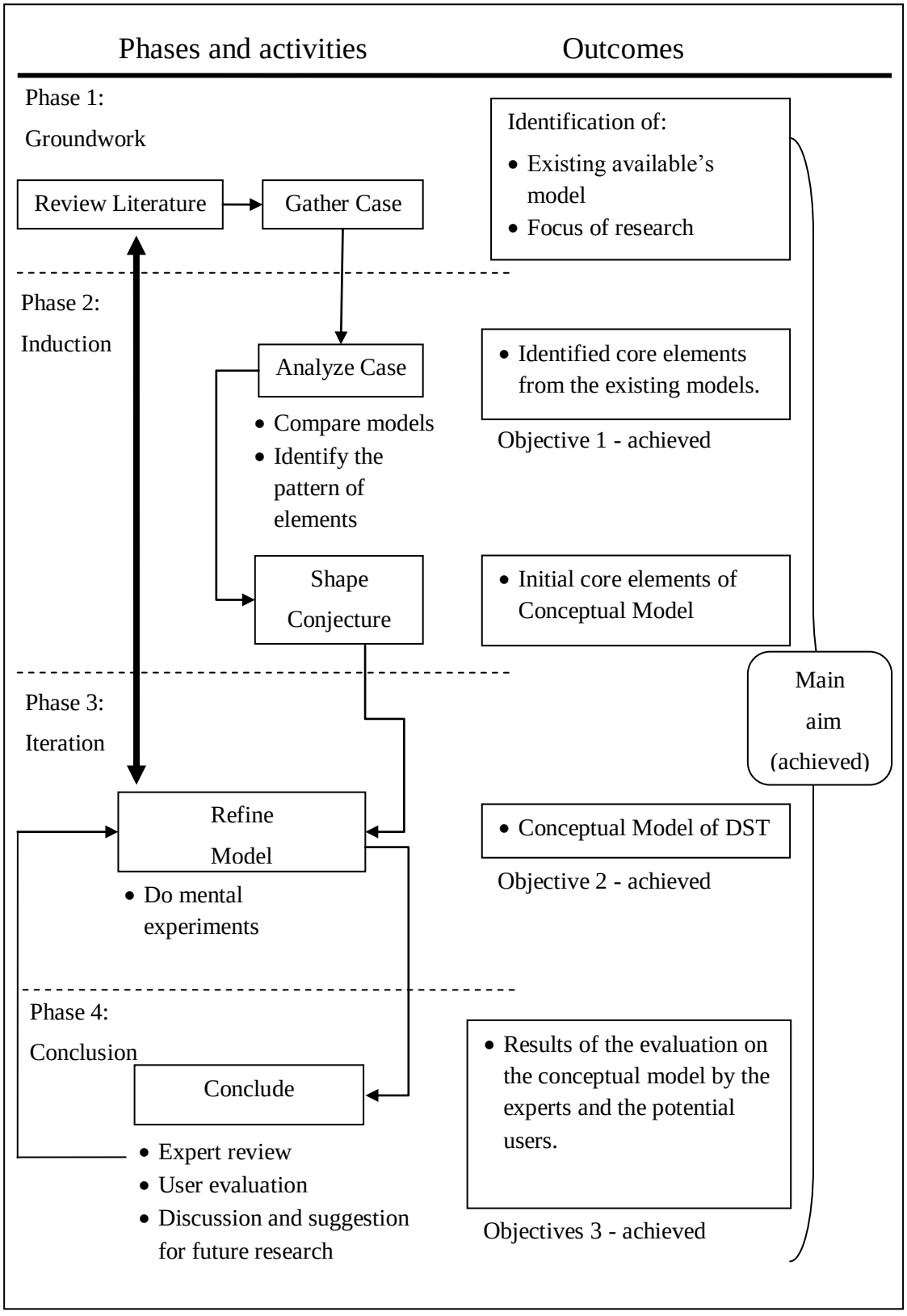


Figure 1.2: Research framework

The second phase is Induction, which consists of analysing existing element activities and shapes conjecture. The existing models identified are the basis of forming the core elements. The elements of the models were synthesized into related groups. These grouped elements formed the initial conjecture which is the initial version of the conceptual model. The conjecture provides the basic information on the attribute, and relationship identified between the elements from the different model.

The following phase is Iteration which is a repeated process of refining the conceptual model constructed. This phase includes mental experiments sub phase. Mental experiments reflect the work of the researchers to keep improving and iterate the core elements represented by the conceptual model via their own experiences and assumptions, reviewed literature, and the data collected (Lewis, 1998).

The final phase is conclusion where the conceptual model is reviewed by DST experts who have been involved in the DST field for more than five years in order to get their feedback on the core elements proposed. The results of the review are analysed and explained in details in Chapter 5. After the results of the expert review are obtained, the iteration of the conceptual model is performed for the last time to visualize the final form of the conceptual model proposed in accordance to the experts' feedback. Once the last iteration is done, the closure is reached which means the iteration has reached the stopping point where the analysis and integration of the elements based on a mental experiment by the researchers and experts' feedback have become saturated and barely contributes to any new and significant information. Finally, as the conceptual model was being completed, the direction and

future research to promote improvement of the study is elaborated as part of the conclusion phase.

1.8 Research Scope

This study covered only the seven DST models (Lambert, 2006; Ohler, 2008; Paul & Fiebich, 2005; Porter, 2004; Robin, 2008; Salpeter, 2005; Schafer, 2008). Any other models are not considered due to time constraint. Moreover, the study also focused on two categories of DST identified which are non interactive and interactive DST. Additionally, the sample selected for the user evaluation is the model potential users. The potential users were differentiated by two types of user group which are experienced users and non-experienced users.

1.9 Contributions of Study

The primary aim of the research in this study is to reassess the concept of DST elements from a new perspective. So far, most studies and works on DST lack of focus and sometimes redundant when it comes to the elements of DST construction. In this study the researcher has tried to study all of the elements by different experts and based on the study, those elements, deemed as core elements, were categorized into two which are interactive and non interactive. The core elements identification has lead to the development of the DST Core Elements Conceptual Model. The expected contributions of this study mainly focus on three which are: knowledge, practical, and theory.

1.9.1 Contribution to body of knowledge

The comparative analysis as depicted in Table 1.1 indicated that elements proposed in the selected models are redundant and caused misunderstanding. Moreover, none of the existing models had cover both types of DST. The conceptual model developed and suggested in this study is seen as a possible solution which could at the same time contribute to the pool of DST knowledge.

The model together with the core elements could be utilized by researchers in many fields such as education, multimedia and journalism. In particular, it affects the student's literacy survival in this digital age (Lowenthal, 2009; Robin, 2006) Utilizing this model in class as a case study could enhanced the body of knowledge in DST field.

1.9.2 Contribution in term of Practicality

The core elements suggested in the proposed model are deemed necessary by the DST experts. Therefore, the model is seen as a suitable guide to the DST practitioners. For instance, a digital storyteller can develop his storyline to include the elements for interactive or non-interactive story. This is supported by the evaluation results from the 62 potential users.

1.9.3 Contribution in term of Theory

The outcome of the study also reveals the theoretical framework that shapes and molds the entire process of study. The theoretical framework consists of theories and models that support and justify the entire study, as well as the complete

evaluation process to validate the conceptual models developed from both expert and user perspective.

It is imperative to include the theoretical framework as one of the contributions since its components help to show the consensus of the previous researchers on the research gap and the core elements proposed. The proposed conceptual model also is supported by a numbers of theories which are Cognitive Theory of Multimedia Learning (CTML), Minimalism, Aristotle's Theory of Drama, Neo-Aristotelian Theory of Interactive Drama, and Storylistening Trance Experience Model. By including these theories, contribution of the proposed DST model is justified. Apart from that, it also depicts clearly the types of evaluation work done to validate the conceptual model.

1.10 Definition of Terms

The definitions of key terms that are used throughout the study are presented as follows:

1.10.1 Digital Storytelling (DST)

DST is a combination of the art of storytelling and digital media such as audio, video, and graphic to convey a story to others. It could be combined and tell the story in video form, or the story is narrated through a sequence of plots in a digital product.

1.10.2 Non-interactive DST

The non interactive DST is generally a linear story presentation. Mostly, it is a personal story told mediated by computer technology. Non-interactive DST is usually a short multimedia presentation (2 to 10 minutes) that combines with different digital media such as photo, video, animation, sound, music, text, and narrative voice.

1.10.3 Interactive DST

Interactive DST is DST applications that require or enable the audiences or users of the application to interact throughout the story progression; sometime it reaching to the extent where they can influence the flow of the story.

1.10.4 Core elements

In this study, core elements refer to the compilation of elements that should be considered in developing an interactive or a non-interactive DST.

1.11 Report Structure

The report is organized according to the following structure:

- Chapter 1: This chapter consists of the background of the study, problem background and research gap, research questions and objectives, the theoretical and research framework, scope of the study and significance of the study conducted.

- Chapter 2: This chapter elaborates the issues involved in the study conducted including the brief history of storytelling, background of DST, theories, models, and many more. It starts with general issues and converging at the end by tying everything to the research gap.

- Chapter 3: This chapter discusses in details regarding the methods used in conducting the study in order. The research framework stemmed from Lewis's methodology (Lewis, 1998) is explicated.

- Chapter 4: This chapter explains the conceptual model proposed along with the core elements identified in the study. The categories, clusters and the definition of the core elements proposed are elucidated in this chapter. The process of identifying is also explained.

- Chapter 5: This chapter reports the result of expert review and users evaluation conducted on the conceptual model. The outcomes of the analysis on the results are reported here to mirror the feedback of the experts and users on the conceptual model proposed.

- Chapter 6: This chapter is the opposite polar of Chapter 1 which concludes the study by explaining once again the essence of the study which is the research questions and objectives. Apart from that, the limitation and future works of the study are also included.

CHAPTER TWO
LITERATURE REVIEW

2.1 Chapter Overview

This chapter discusses the literature study conducted which pertains to DST. The review of literature is the first step of in the study to comprehend and identify the issue in DST in depth to generate the research problem, research question, and the gap of the study. It begins with the understanding of DST background inclusive the exploration on the definition of DST and genres or type of DST and existing models representing the elements and not to forget, the experts. A thorough reading on the existing models is conducted to construe and discover new core elements to be proposed as finding of the study. Entailing every sub-chapter, the implications of these literatures are also discussed to mirror their influences on the study.

2.2 Background of DST

Since immemorial time, humans have been utilizing storytelling as their most common conversation form to pass on wisdom and knowledge. In the early day, people tell stories about nature, weather, phenomena, and even myth which in the end become part of culture in a particular society. Those stories were told orally, written on stones and walls that preserve their history, culture and identity (Collins & Cooper, 1997; Frazel, 2010)**.** In order to better understand DST, what better way to start than understanding its origin first, that is storytelling. Therefore, next section is dedicated to explaining storytelling briefly before bridging it to the transition to its successor which is DST.

2.2.1 Storytelling and Technology Transition

Storytelling has existed in this world as old as time. People tell a story to impart knowledge and pass on wisdom informally. There are many perspectives of storytelling to different people. National Storytelling Association describes story as "the art of using language, vocalization, and/or physical movement and gesture to reveal the elements and images of a story to a specific, live audience" (as cited in McWilliams, 1997). Pellowski (1977, p. 15), however, perceives storytelling as "art or craft of narration of stories in verse and/or prose, as performed or led by one person before a live audience". The differentiation is the perception of storytelling does not deter the one similar fact that it is a medium to disperse message or information from one party to another.

Standing steadfast through time and space as one of the powerful medium to communicate, storytelling gradually evolved from being passed on stones and walls, and words to being imprinted on paper and books in an effort to convey a story strongly and with more efficiency. Much later after the glory years of papers and books, digital technology came as information technology and multimedia were born. The digital technology intervention has introduced as new face of storytelling known as DST. As a glimpse of DST early history, DST was pioneered by Atchley assisted by Lambert who narrated the very first DST by synchronizing his stories to the video segments projected on a backdrop from a computer in 1990 (Lambert, 2006). The storytelling session was well received and seeing the acceptance of the new paradigm of storytelling, Lambert grasped the opportunity to flourish and nurture DST by establishing an influential organization for that particular purpose. It

was sanctioned as the Center for Digital Storytelling (CDS) and it held workshops to assist people channelling their life stories via a digital medium (Lambert, 2006). In order to gain better understanding and clear insight regarding DST a new entity in storytelling domain, the next section is dedicated to define DST and diverse perspective of people on it.

2.2.2 Definition of DST

Being the relatively new medium to convey message and information, DST still stands in the shade of grey in terms of its definition and interpretations among the mass, generally and storyteller, specifically. There are assorted school of thoughts that define DST in various ways. Nonetheless, all those perception and definition on DST share a very common gist. Robin (2008) sees DST as a very old oral storytelling integrated with technology tools to narrate personal tales using multimedia elements and the storyteller's own voice. Another insight on DST says that it is an unconscious act of using new technological tools to satiate humans' need in narrating their story (Ohler, 2008). Summarizing from his book entitled Digital Storytelling: Capturing lives, creating community, DST is a process of personal story construction using multimedia elements as props to amplify the message intended to deliver (Lambert, 2006). Slightly differ, Schafer (2008) defines DST as a way of telling stories digitally by utilizing digital media materials such as digital photos, recorded audio and music, video clip and text. She emphasized greatly on DST application that permits interactivity between the digital story and the digital storyteller instead of traditional linear DST as invented by Atchley. C. H. Miller (2008) possesses similarity in defining DST in a way that she also accentuates on

element of interactivity in DST as a form of entertainment. Judging from these few examples, no matter how diverse the definitions are, there is still one common gist shared by them which is DST is the telling of old form story using computer as medium and the new media to amplify the message of the story.

2.2.3 Implications of DST Background and Definition on Study

It is imperative to learn and acknowledge different perspective people have on DST. This is due to the lack of single definition that pinned DST as the one true form accepted by all digital storytellers. By studying the pattern of the definition of DST, it contributes to the establishment of the scope of study. The pattern reveals that DST can be categorized into two which are non interactive and interactive. Non interactive represents the non interactive DST of DST as invented by Atchley and Lambert. As for interactive DST, it is relatively a modern and different form of DST though it still retains the same purpose which is delivering message and information. This can be seen from works of Schafer and Miller. The next section will discuss more regarding categories and genre of DST.

2.3 Categories and Genres of DST

Starting as a linear storytelling accompanied by early computer technologies, DST has bloomed and varied as the years passed by. The variation of DST evolution is due to the distinguish goal to be achieved by a digital storyteller and the current technology accessible (Pierotti, 2006). According to Pierotti (2006), the progression of DST has gave birth to different genres of DST such as gaming, Multi-User Dungeon/Domain/Dimension Object Oriented (MOO), blogging, psychogeograpy,

and also including the ever original multimedia stories invented by CDS. Considering other perspective, Lambert (2006) in his book entitled *Digital storytelling: Capturing lives, creating community* wrote that there exist other possible genres of DST practiced by digital storytellers apart from the one introduced by CDS. Some DST were incorporated in theatre and performing arts while some were developed as hypertext and interactive DST, diaries, journals, blogging and podcasting and lastly, place-based mobile storytelling. The new generation of DST genres is more than just a personal linear multimedia storytelling. They shared certain similar characteristics that were mentioned by C. H. Miller (2008) such as:

- **Types of narrative**: they involve a series of connected dramatic events that serve to tell a story;
- **Work that contain characters**: including types of characters found only in digital media: characters controlled by the user or by the computer, and synthetic character with the appearance of artificial intelligence (AI);
- **Interactive**: the user controls, or impacts, aspect of the story;
- **Non-linear**: events or scenes do not occur in a fixed order; characters are not encountered at fixed points;
- **Deeply immersive**: they pull the user into the story;
- **Participatory**: the user participates in the story;
- **Navigable**: users can make their own path through the story or through a virtual environment.

Summarizing from the ideas on DST genres generated by the prominent people in DST domain, it can be expressed that DST can be categorized into two prominent groups with one intersected group. The two prominent groups are interactive DST, the new breed and non-interactive, the traditional linear DST as practices by CDS. The integration of both category results in a hybrid genre in the middle which is not the scope of the study hence it is not emphasizeds. Figure 2.1 illustrates the categories and genre interpreted by the researcher from the previous study by Pierotti and Lambert.

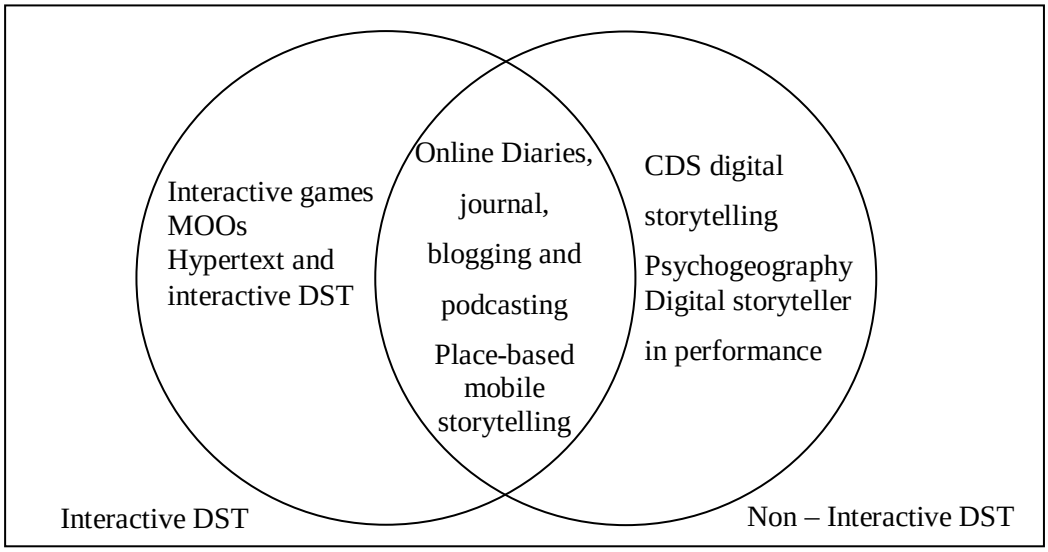


Figure 2.1 Categories and Genres of Digital Storytelling

Since the scope of the study inclusive the two prominent categories, the upcoming sections will elaborate more to better explain the essence of the categories.

2.3.1 Interactive DST and Non-Interactive DST

The literature conducted on several opinion and thoughts of DST have revealed two salient categories which are interactive and non interactive DST. The interactive

DST requires and permits interaction between the audience or user and the story being told. The audience may even be able to influence the flow of the story. The non interactive DST is generally the original linear DST as invented by Atchley and Lambert. Generally it is a personal story told mediated by computer technology. Both categories, however, share common purpose which is to narrate and to tell story with the amplification of the message via technology usage. Miller (2008) addressed several dissimilarities of the two categories of DST. As listed in Table 2.1.

Table 2.1: The differences of Non-interactive DST and Interactive DST

Non-interactive DST	Interactive DST
• Are pre-constructed; story elements cannot be changed • Have a linear plot; they are usually told in linear fashion • Author/writer is sole creator • Are experienced passively • Have one unchangeable ending	• Are malleable; they are not fixed in advance • Are nonlinear, non-chronological • The user co-creates the story • Are experienced actively • Different outcomes are possible

(adapted from *Digital storytelling: a creator's guide to interactive entertainment* Source from C. H. Miller, 2008, p. 19)

Looking at Table 2.1 it is clear that interactive DST is much more flexible, dynamic and user's involvement contributes to the flow of the story. Nevertheless, non interactive DST preserves the basic notion of DST since the day it was invented on the stage of The Next Exit by Atchley (Lambert, 2006). The non interactive DST reflects the original DST that immerses the audiences in a personal linear story with an ending that leaves impact on the audiences. The audiences get involved in the story told emotionally but cannot influence the flow of the story. Even though Miller (2008) stresses on interactive DST, she also argues that despite the differences of

those two categories, interactive DST will not be much different than its counterpart with the absence of interactivity elements. All that is left is a story in digital form. Having said that, the interactive category is an evolution of the non interactive DST. However, no matter how distinguish they are, story and storytelling remain as the substance.

2.3.2 Implication of DST Categories and Genres on Study

The two categories of DST that have been identified from the literature study conducted mainly contribute to the scope of the study conducted. As a bonus, they also assist in defining the boundaries of the clusters adapted from Schafer (2008) and the core elements identified in this study. It is crucial to identify the categories because DST has not gain a stable ground in terms of defining its category and the elements belong to it (Schafer, 2008). There are categories, definitions, and elements but it seems that they are scattered, decentralized and everybody is claiming their own piece of work is a DST without any knowledge regarding it. Moreover, the categories defined and identified will help to display the connection of the elements that exist between interactive and non- interactive DST. Next section will elaborate more on the elements and the people that the study has deemed as expert in DST.

2.4 Experts and Elements of DST

Initially started by Atchely and supported by Lambert, the movement of DST has taken its momentum and what began as linear and personal computer mediated storytelling has spun its thread of popularity and caught the interest of many successors of Atchely including Lambert himself. These people that the study

labeled as expert have been involved in the movement and the creation of DST to nurture the unique medium of information dissemination. Each of them has their own perception of DST and some of them remain true to the original form as invented by Atchley. As stated in the scope of study in Chapter 1, the study has identified and restricted the number of people that are reckoned as expert to eight. They are Lambert, Porter, Ohler, Salpeter, Paul and Fiebich, Robin and one of them is Schafer which this study used her framework on DST and future work as the starting point. Each of the expert contributions in inventing or adapting elements of DST is discussed in the following sections.

2.4.1 Lambert's Model

Lambert was the single person who rooted and supported Atchley during the early years of DST. When nobody else understood the potential of DST, he confidently stood behind Atchley in fostering the culture of DST in every domain possible. As he established CDS along with several other people whose interest in DST is strongly submerged, workshops on DST have been organized to assist people in telling their personal stories via DST. Observation on the DST works from the workshop has revealed seven elements that are able to guide digital storyteller in developing DST (Center for Digital Storytelling, n.d.; Lambert, 2006). The elements with the brief descriptions are as listed in Table 2.2.

The seven elements of DST by Lambert focus on guiding the development of the non-interactive DST. In addition, the DST also emphasizes on real life and personal stories. Lambert (2006) encourages people to tell stories about real life, real person

and even narrated by the digital storyteller himself. This can be seen from the elements itself. The very first element - Point of view states that the story is better written in the first person view. Beside that this it also means a story told is achieving a goal. The goal is the factor that drives the progression of a story.

Table 2.2: Seven Elements of DST by Lambert (2006)

	Elements	Description
1	Point of view	A personal story with first person perspective and a point (reason the story exists) which is to be passed on to the audience.
2	Dramatic question	Dramatic question establish suspense and create a story arc.
3	Emotional content	Let the story take hold of audiences and let them know the emotional moments that they are in.
4	The gift of your voice	The sound of the storyteller's voice adds level of vulnerability and authenticity to the story.
5	The power of the soundtrack	Use appropriate music and sound effect can add depth to visual image of story.
6	Economy	A compact, fast moving digital story will contain only those elements necessary to move the audience from beginning to end.
7	Pacing	The rhythm of the piece is what keeps the audience's interest in the story.

The second element is Dramatic Question. This element guides the development of DST by stating that by injecting a question that is to be answered at the end of the story, it serves to grasp the attention of the audience to watch and listen to the story to the end in order to know the resolution. By imposing a question also creates an arc in the story that can hook the attention of the audience.

The third element, Emotional Content says that emotion is one of the important elements in story. A story rich in emotion comes from true story where the feeling come from the heart. As the story is told, emotional paradigms are one of the factors of engaging the audiences to the story. Digital storyteller could manipulate emotions such as happiness, sadness, and frustration to touch the audience's core being.

The gift of voice marks as the fourth element. According to Lambert (2006), the use of voice in DST development is not necessary but imperative because human's voice is a great gift. He also insists that people who aspire in telling story digitally to use their own voice as the narrative element in the story. Point being if someone want to tell their own personal story, their own voice might enhance the chance to connect with the audiences emotionally hence, engaging them to the content of the DST.

The fifth element is the soundtrack used in a DST. Lambert (2006) says soundtrack is a complementary element and not compulsory. This means DST does work in imparting message without the use of soundtrack but its existence helps to strengthen and stir emotion if used correctly and not excessively. The combination of soundtrack, visual, and the voice of the narrator help to immerse the audience more in the story. It is also stated that soundtrack can be in instrumental or with vocal form. Nevertheless, as advised by Lambert (2006), instrumental is preferable over soundtrack with vocal for the vocal might perturb the narrator's voice.

Economy made the sixth element introduced by Lambert. As the common feature shared among other experts, DST is supposed to be short. The shortness of the DST ensures that it contains, reveals, and delivers meaningful message with least

materials used (Lambert, 2006; Porter, 2004). The efficient composition between visual medium and text medium in the editing process is where the element economy takes place.

The last element is pacing. Pacing in DST is about letting the story breathe. Story that breathes prevents it from sounding mechanical and planned. Being mechanical and planned is the last thing DST should be. Developing DST, the story should stop, pause, and moves a little faster whenever the situation calls for it (Lambert, 2006; Simmons, 2006). By doing this, the DST becomes alive and story that lives attracts the audience attentions better.

The next section will discuss the element introduced by Robin, the second expert found with his own set of elements.

2.4.2 Robin's Model

Adapted from Lambert's set of element, Robin (2008), introduced a set of DST elements. Table 2.3 shows the 10 elements and the description of each of the elements.

As aforementioned, the set of element are adapted by Robin from CDS, with some modification to suit the educational DST of the University of Houston. The 10 elements are also used as a rubric to evaluate the student creations of DST.

The initial element is the overall purpose of the story. This very element is the get go to create a DST. Basically, it says that a DST should has a rudimentary substance or

a topic that will hold the contents of the story true from beginning to the end. The journey of the story must not stray from the purpose set at the beginning of the DST.

Table 2.3: Ten Elements of DST by Robin (2008)

	Elements	**Description**
1	The Overall Purpose of the Story	Establishe a purpose early on and maintains a clear focus throughout.
2	The Narrator's Point of View	The point of view is well developed and contributes to the overall meaning of the story.
3	A Dramatic Question or Questions	A meaningful dramatic question is asked and answered within the context of the story.
4	The Choice of Content	The content creates a distinct atmosphere or tone that matches different parts of the story. The images may communicate symbolism and/or metaphors.
5	Clarity of Voice	Voice quality is clear and consistently audible throughout the presentation.
6	Pacing of the Narrative	The pace (rhythm and voice punctuation) fits the story line and helps the audience really "get into" the story.
7	Use of a Meaningful Audio Soundtrack	Music stirs a rich emotional response that matches the story line well. Images coordinated with the music.
8	Quality of the Images, Video & other Multimedia Elements	Images create a distinct atmosphere or tone that matches different parts of the story. The images may communicate symbolism. and/or metaphors.
9	Economy of the Story Detail	The story is told with exactly the right amount of detail throughout. It does not seem too short or too long.
10	Good Grammar and Language Usage	Grammar and usage were correct (for the dialect chosen) and contributed to clarity, style, and character development.

The second element is the point of view of the narrator. This element has similarity with Lambert's point of view element and establishes strong connection with Robin's first element. Had the overall purpose of the story been established, the narrator's mind set helps to focus the story on the purpose and topic selected. By focusing on the purpose, it will aid in achieving what the DST tries to deliver and once achieved, the meaning of the story is imparted.

Third element in this model is dramatic question. Dramatic question is the element to engage the audience engaged to a story. Robin suggests that an important and meaningful question is raised and solved in a DST to keep the audience glued to the end. A meaningful question is raised somewhere in the storyline and resolved at the end to build engagement and impact on the DST.

The forth and the eighth element are closely related since both talks about the atmosphere of DST. The forth element suggests that content of DST should be selected carefully to mirror the different tones of scenes in DST. As for the eighth element, it advocates similar action but tailored towards the use of proper image to reflect the precise tones in the DST. Both elements also stated that the content and the image do not have to literal but representation is permitted.

Besides the quality of content and images, Robin is also concerned about the voice that narrates the story. He is obviously particular about the quality of the voice in DST. The fifth element demands that the voice of the narrator to be clear and audible to the audience from the beginning to the end of the story. Moreover, the sixth element also touches on the voice use in DST. The element justifies by varying the

tones of voice in story according to the moods of the story helps to immerse the audience into the story told.

The seventh element in Robin's model, the use of meaningful soundtrack is similar to the soundtrack element introduced by Lambert. As described by Lambert, this element also stresses on the appropriate use of music to stimulate emotion with the combination of visual information which allows audience to be more immersed in the story.

The ninth element is the economy of the DST. Economy in DST is all about using the right amount of material such as image, video, text and music. It also emphasizes on the length of the DST. DST should not be too long. Instead, it should be short and sweet with the right impact on the storyline. To students, this will overcome the problem of time constraint in classroom (Ohler, 2008).

Finally the last element by Robin is the usage of good grammar and language. This one particular element is about the staying true to the root of the digital storyteller's root. It says that the narrative can reflect any dialect used because the dialect of the story establishes the style and character of the story as long as it is clear and truthful to the specific dialect. The third expert founded is Porter and her set of element is elaborated in the following section.

2.4.3 Porter's Model

Working as a DST consultant and active in organizing DST summer camp, Porter has introduced six elements of DST in her book: DigiTales – The art of Telling

Digital Stories. These elements serve just as the other elements suggested by other experts which are to provide a general guide in developing a good DST (Porter, 2004). The elements with the short description are listed in Table 2.4.

Table 2.4: Six Elements of DST by Porter (2004)

	Elements	Description
1	Living inside your story	Each story told in first person perspective narrated with your own voice on the event with your personal and emotional experience.
2	Unfolding lesson learned	"Each story needs to have a point that is revealed in the end."
3	Developing creative tension	Creatively use tension and pacing in evolving the story and at the same time engages the audience through the end.
4	Economizing the story told	Preserving the essence of the tale; using the fewest words and images to make your point.
5	Showing not telling	The use of vivid details to reveal feelings and information rather than being directly stated in the story.
6	Developing craftsmanship	Good craftsmanship creatively combines media elements to convey significant meaning.

Just like Robin, Porter was inspired by Lambert and the work done in CDS since her DST works incline toward linear DST as well. The first element in Porter's model is living inside your story. The element says that in order to tell a good DST, the story told should come from personal and emotional experience rather than just narrate a story about an event none related to the digital storyteller. Since the element suggest telling the story personally hence it is best for the digital storyteller to use his own voice and tell the story from the first person perspective.

The second element is unfolding lesson learned and it has similarity with Lambert's and Robin's elements that talk about having a point to achieve in DST. Porter indicates that a good DST has a point to be unveiled in the end. This means the DST must have a point to make and cannot tell a story randomly without achieving something in the end.

The third element in Porter's model is developing creative tension. Developing creative tension is about manipulating the uncertainty, suspense, and pacing in the DST in a way that would hold the audience's attention to the story. The tension is supposed to build the momentum and interest of the audience to watch the DST till the end.

The fourth element is economizing the story told. This element suggests a good DST does not have to be abundance in the use of words and images to narrate the story. Making a point using the fewest necessary materials possible would make a DST more meaningful and the impact it creates would be much stronger.

Showing not telling is the fifth element in the set of elements introduced by Porter. This element is about disseminating message or information in DST indirectly without using words or voice. The use of metaphor and symbolism is at practice here. Image, for example, can be used to replace words or dialogue to impart meaning in the story. Sometimes words can be described better with other medium (Mayer, 2005b; Porter, 2004).

The last element is developing craftsmanship and it is contrary to the fifth element. It is about the art of combining media elements to convey significant meaning. The combined materials can explicitly convey the message in the story.

The next section will explain regarding the set of elements introduced by Salpeter, the fourth experts ascertained in the study.

2.4.4 Salpeter's Model

Salpeter (2005) formerly an editor in chief of Tech & Learning had posted an article titled Telling Tales with Technology. The article touched on DST and examples of it. In the article, Salpeter discussed the story of Atchley and his story world and also the inspiring works from CDS. Deriving from her observation on phenomena of DST, Salpeter pint pointed six elements that she deems as vital in developing good DST. The elements are as shown in Table 2.5.

Salpeter did not state literally whether her elements are adapted from Lambert or any other experts but the similarity between her set of elements with the others is pretty evident especially Lambert (2006) and Porter (2004). Therefore the descriptions of most of the elements are familiar to the previous experts' elements. The first element is designated as personal. Salpeter encouraged people who aspire to tell their story via DST to personalize it. Personalizing the story means the digital storyteller tells a story that somehow someway left an impact and consequences in his life. As Lambert emphasizes the story is better to be told from the first person perspective, Salpeter does not seem to share the same notion. She focuses the DST being more personal to the digital storyteller.

Table 2.5: Six Elements of DST by Salpeter (2005)

	Elements	Description
1	Personal	The narrator is encouraged to personalize the tale, making it clear how the people or events in the story impacted his or her life.
2	Begin with the story/script	Digital story creator are expected to narrow into their story, writing and even recording their script before they ever begin digitizing images, importing sound effects, or using video editing tools.
3	Concise	This means tight editing and a very specific focus.
4	Use readily available source materials	Create a story with the minimum materials and technology.
5	Include universal story elements	Good stories include essential elements such as conflict, transformation, and closure.
6	Involve collaboration	Workshop participants give and receive feedback on their stories and scripts.

The second element introduced is to begin DST with a story or script. Basically this element stresses that DST is not about the bells and whistles of technology. Aspiring digital storyteller should focus on the creation of the story instead of the technological sides of DST. Write and record the script of the story in prior of everything else. DST is in fact born of storytelling hence the emphasis should be on the story. The technology comes later as a medium to amplify the story needed to convey.

The third element and fourth elements is about keeping the DST succinct and simple without exaggerating. According to Salpeter, DST should have focus and edited well to keep it brief and short and she also indicates that the use of technology supports should be kept to minimum and only serves to escalate the message of the DST. This

shows connection with the previous element which strongly signifies that technology comes second to storytelling.

The fifth element is universal story elements. DST comes from traditional storytelling and good traditional storytelling always include universal story elements such as conflict, transformation, and closure to guide and focus the audiences' attention on the story. Since DST main component is storytelling, it is only logical and fathomable that digital storyteller should put into consideration of including universal story elements in developing a good DST.

The last element introduced by Salpeter does not have relation to DST development but instead on the developed DST. She stated that for the betterment of DST development, it is good to involve collaboration among the digital storytellers. The DST developed especially in workshops can be improved in terms of its story and script by providing and receiving feedback on each others' DST. Next section will elaborate eight elements of DST invented by Ohler in education domain.

2.4.5 Ohler's Model

With his dedicated attention on nurturing DST in education domain, Ohler wrote a book entitled *Digital storytelling in the classroom: new media pathways to literacy, learning, and creativity* discussing deep and specific issues on the use of digital storytelling in classroom (Ohler, 2008). Deriving his opinions and thoughts on DST from his years of experience working with teachers and students, Ohler initiated eight elements of DST focusing on DST for education purpose. The eight elements are as shown in Table 2.6.

Table 2.6: Eight Elements of DST by Ohler (2008)

	Elements	Description
1	Point of view	The range of the point of view that can be employed in digital stories is vast and is constrained only by whatever perspective it wanted to be imposed.
2	Emotional Engagement	Storyteller having enough finesse to attract the audiences (either emotionally or impartially).
3	Tone	Tones may divert story to a different genre or moods.
4	Spoken Narrative	Storyteller gives narrative the appropriate amount of focus in their story.
5	Soundtrack music	Music used in an appropriately supportive role.
6	Role of video and performance	Choose the suitable visual image to be used based on time and technology consuming.
7	Creativity and originality	Teacher must have clear expectation, required a certain percentage of media. Digital tool can encourage student to find the creative storyteller, but not guaranty originality.
8	Time, story length and economy	Limit the story length and input, enforce economy.

Looking at the elements, it can be said that Ohler's eight elements also has similarity with the previous elements discussed. He plainly stated in his book that the main inspiration came from Lambert's and CDS's work on DST and he adapted it to suit in education domain. Nonetheless, his way of explaining his elements is different from the rest of the experts since he does not dictate the element from singular perspective to achieve good DST. Instead, he discusses the possibility that teachers and students can manipulate the elements to their own benefits. The first element is point of view. As explained in his book, his outlook on this element is a bit different than the other experts. Ohler does not deny that first person perspective is good in

DST but in education it might impose restriction in DST development since not all the story are about the digital storyteller's personal life or point of view. Therefore, there is leniency in this element that it is not restricted to first person perspective. For classroom purpose, teachers may impose the type of point of view required or the students can determine it on their very own.

The second element is emotional engagement. Ohler has an unorthodox view on emotion element in DST. Emotion involvement in storytelling undoubtedly has strong connotation and influence on the audience (Ohler, 2008). Nevertheless, Ohler deliberated that DST that has strong story core does not require emotion element to propel the audience attention from one scene to another. He does not deny that emotion inclusion serves to engage the audiences' attention but in education domain, sometimes it is hard to display emotion in the DST developed since education deals with objective argument that is devoid of emotion. It is up to the teachers to measure how much emotion is needed in the particular DST developed.

The third element is tone. Tone, in Ohler definition is the timbre of voice of the digital storyteller. The voice of the digital storyteller could be of many different tones such as sober, funny, heart wrenching and many more. According to him, tone mixture in DST in education must be selected appropriately from clear to unclear boundaries. Diversifying tone in a DST is good but it is difficult to do especially to students. Therefore, teachers are advised to foster students to choose one particular tone and they should work on the DST in the clear tone boundary chosen. However, choosing to not have clear boundary of tone does not make a DST wrong but only requires more creativity in switching the tone of voice.

The fourth element is spoken narrative. This element is mainly about the narrative part of the DST to convey the story. Generally Ohler discusses about the amount of focus in the DST narrative. The more focus the narrative the better is the DST. The focus of DST refers to the clarity and coherence of narrative in carrying the story and everything else that affects the quality of the DST message. It is plain that Ohler suggests the teachers to show heavy interest in narrative since it is the rudimentary aspect of DST and universal element that belongs to both DST and traditional storytelling.

The fifth element is soundtrack music. In his book, Ohler sees music as supportive and distracting depending on how the digital storyteller uses it in the DST development. Music, if used correctly and in the right amount and places, could help to engage audience emotionally and focus the narrative convey. Nevertheless, if overuse, it can be distracting and encourage the digital storyteller to be lazy because he depends on the music to engage the audience instead of good scripts and narrative, as examples. In DST, it is imperative to remember that the music is second to narrative and not the other way round. In this case, the DST would still stand strong if the music element is deducted from the story. As an addition, music must not be louder than the narrative to the extent where it engulfs the narrative from its focus.

The sixth element is role of video and performance. From Ohler's point of view, DST can be constituted of still image and narrative or includes video materials. He clearly stated that beginners of DST usually stick to the use of still image and narrative to develop their DST. However, he encourages the teachers to foster the

use of video materials in DST among students for it can enhance other abilities apart from narrating such as speaking, acting and presenting. It can be tough in the beginning but with proper guidance and practice, video can add quality to DST. The video materials are not restricted to acting but also encompass interviews, community events, movie footages and so many other possible sources students can think of in their creative young minds. Nonetheless, video, just as other new media materials being used in DST development, must be use with care. Teachers must play the role of facilitator to ensure that the video materials used by the students complement the academic message or information the DST intends to transmit.

The seventh element is creativity and originality. The foundation of discussion of this very element is where the students' DST works sit in the scale of being creative and original. The question imposed is whether the students should focus on being creative while remain intact to the originality or should they choose either one. According to Ohler, the role to shape the originality and/or creativity of the DST falls on the teachers. Teachers have to decide the types of DST works that the students required to develop and the expectations must be clear. In the case of retelling some available piece of works in the form of DST, originality is void but creativity is the focus. Nevertheless, if the DST is about conveying new non existing information then originality is by default along with creativity. Originality also refers to the media materials that the students use in developing the DST and creativity is about moulding them into proper form of DST. Furthermore, teachers have to understand that being creative is not a finite ticket to being original.

The final element is time, story length and economy. Generally this element separates its discussion into three smaller elements but all three share the same aim which to cut everything short in DST development. The time of the development and the length of the DST is mutually connected. It is plain as stated by Ohler that the longer the length of the DST means the more time needed to develop it. The proper duration suggested is two minutes approximately. This is also due to the fact that short DST forces the digital storyteller to be economic which is to carve the DST of unnecessary material be it media or information. Short DST would focus the students more on important matters to include in the DST development. The next section will discuss the elements of DST as suggested by Paul and Fiebich.

2.4.6 Paul and Fiebich's model

Based on a project run by School of Journalism and Mass Communication's Institute for New Media Studies from University of Minnesota and The Media Centre, these two experts together had examined many DST and they describe it as interactive, multimedia and experiential (Paul, 2004; Paul & Fiebich, 2005). They have derived five elements that would help explain the taxonomy of DST development. The elements are as listed in Table 2.7.

The five elements introduced by Paul and Fiebich (2005) are very much different from the ones discussed in previous sections and they are absolutely not adapted from Lambert's. They still reflect the elements that guide the development of DST but the focus is distinctive from that of Lambert's. This is due to the fact that both of them concentrate on journalistic storytelling in digital era (Paul, 2004). The

movement of DST in journalism follows a relatively different path since it involves interactivity and not just passive traditional storytelling.

Table 2.7: Five Elements of DST by Paul and Fiebich (2005)

	Elements	Description
1	Media	Media refers to the material(s) used to create the story package. Unique to the digital story space is the ability to use any type and combination of media.
2	Action	Action refers to behaviour of the content; which consists of movement within the content or a movement of content acquires user action.
3	Relationship	Relationship refers to the connection and level of interactivity between the user and content.
4	Context	Context refers to how the story link to the relevant external information or material.
5	Communication	Communication refers to the mode of communication in the progress of story content.

The first element is media. Media refers to the integration of materials used in crafting the stories and the relationship among them. In discussing this element, Paul and Fiebich (2005) subdivided it into four sub elements. They are as the following:

1) Configuration is the relationship between media used in the story package.
2) Type identifies the medium or media used to tell the story.
3) Currentness indicates synchronous or asynchronous delivery.
4) Time / Space address editing of the content.

According to Paul and Fiebich (2005), DST can be composed of three types of media. The first one is single media. Single media refers to the DST that utilizes one type of media to convey message such as video or audio. This clearly reflects the non

interactive DST as practiced by CDS. The second one is multiple media and this media about the use of different media at the same time but separately to enhance the effect of the story. The last media is multimedia. Multimedia is similar to the multiple media in terms that it uses different media at the same time to convey a message, but these media are intertwined together to create a cohesive experience for the audience.

The second element is action. This element is furthermore divided into two sub elements which are the content action and the user action. The content action means the DST is passive and does not require the audiences' action to watch the story. On the other hand, the user action requires audiences' intervention to interact with the DST in order to enjoy the content of the DST.

The third element is relationship. This element consists of five sub elements. They are linearity, customization, calculation, manipulation, and appendage. Linearity refers to the order of the movement of the DST content. If a DST is developed with the audiences are only capable to watch the story in order from start to the end then the DST has linear relationship. Customization in DST happens when the audiences are permitted to pick and choose the portion of the DST that they want to watch without having to watch the entire content from the start to the end, then it is said it has customize relationship. Calculation relationship in a DST is about the ability of a DST to take responds from the audiences, calculate it and generate story from it. Basically the inputs from the audiences are pivotal in influencing the path of the DST. In the case where a DST allows its contents to be altered and shifted around by the audiences, it is said to have a manipulative relationship. This type of DST

usually has multiple path of the story, starting and ending since the flow of the DST is firmly dependant to the audiences' manipulation. The last sub element is appendage relationship. This kind of relationship consents the audiences' contribution towards enriching the content of the story. The more people contribute the more the DST evolves. According to Paul and Fiebich, even the audiences' comment on the content of the story is considered as appendage relationship.

The fourth element is constituted of context. This element is all about interactivity and the addition of meaning to the DST. Context is about providing links to external sources that could supply additional information to the story. This is only true for online and interactive DST. Offline and self-contained DST do not utilize this very element. Digital storytellers must be very careful in using this element in their DST since providing links to external sources might interrupt the flow of the DST narrative and the focus of the audiences on the main story. There are four considerations in including context element in DST which are technique, purpose, source, and content. Technique is about identifying the location of the link. Digital storytellers must identify in the first place the links that have the additional content that can support the main content of the DST. Purpose is about knowing the reason of the inclusion of the links. There must be some concrete reasons and purposes of why the extra links are needed to support the DST. Source states that with all the links provided, digital storytellers must always ensure that the audiences always know how to return to the origin of the DST. Last but not least is content. As the developer of the DST, it becomes a responsible for a digital storyteller to know the nature of the content of the link. Apart from identifying the links available as

supportive materials to the main content, it is imperative to ensure that the contents of the links match the contents of the DST developed.

The fifth element is communication. Communication in DST is classified into two types which are one-way and two-way. One-way communication represents the original linear form of DST which the message conveys via one way communication channel. The audience just sit back and watch the DST while interpreting the message delivered. Otherwise, two-way communication involves digital communication with the content developers or other audiences. There are five sub elements of this communication class. They are configuration, type, currentness, moderation, and purpose.

Configuration is composed of four types of communication. They are one to one, one to many, many to one, and many to many. One to one represents a private communication from one person to another such as a direct personal email from the audience to a content creator which is the digital storyteller. One to many is a communication from a person to multiple persons such as a posting to a blog where many people can read the message conveyed. Many to one is the communication from multiple persons to one person. The best example of this type of communication configuration is a public email link made available for audiences to the content creator. Lastly, many to many involves communication between multiple persons to multiple persons. This can be seen from the forum communication configuration.

Type of communication is separated into four which are chat, forum, email, and SMS. In chat communication, information is delivered in real time in messaging space. As for forum, it is a space provided where people can submit messages to be read by others in delay time. Email allows communication not in real time between one to one or one to many people. SMS which stands for short message service, on the other hand, permits direct communication between a person to the content developer outside the compound of DST environment.

Currentness is divided into two which are recorded and live. Recorded refers to the content of DST retrieved from sources like forums and email that is stored and the content creator can use it for the purpose of DST enhancement later in the future. On the polar opposite of recorded is live, which refers to real time content such as chat. Live content enables the content creator to receive feedback pertaining the DST or any issues that matter.

Moderation is the fourth sub element. It is separated into two which are unmoderated and moderated. This element is true to the situation where a DST includes a forum space for the audiences to pour out their thoughts and opinions. The concept of these both sub elements is simple. Taking the forum as an example, unmoderated means the audiences are given the capability to respond on the DST in the space provided unbounded without having to be filtered by the content creator. On the contrary, moderated means the audiences' feedback is reviewed in the first place by the content creator before releasing it into the public space where it can be shared by others.

The final sub element of communication element is purpose. Purpose is simply comprised of three sub elements which are information exchange, registration, and commerce. Information exchange is the element that allows the audiences to communicate with the content creator to request further information regarding the DST and also offer positive comments. Registration and commerce sub elements are totally not the typical elements of DST. Both of these sub elements cover the type of DST that runs transactions online such as online blogs that tell a personal story with advertisements that sells products. Registration is about adding the audiences as part of the DST community to be updated with the latest news, story, or product while commerce is implemented when a DST is not just for the purpose of telling the story but also sells products.

The next section will elaborate the twelve elements introduced by Schafer based on the doctoral research's finding.

2.4.7 Schafer's Model

Based on her doctoral research's finding, Schafer introduced twelve dimensions or elements of DST in her PhD thesis cum book entitled *Investigations on Digital Storytelling the Development of a Reference Model* (Schafer, 2008). The elements were represented in what she called Dimension Star. The elements are as listed in Table 2.8. Abstract Layer Model is another contribution by Schafer (2008). There are five layers in the Abstract layer Model as shown in Figure 2.2.

Table 2.8: Twelve Elements of DST by Schafer (2008)

	Elements	Description
1	Concreteness	Origin of the source of the construct of story.
2	User contribution	User makes contribution to the story structure by interacting to the system.
3	Coherence	The contextual relationship of the story elements
4	Continuity	Describes on the smoothness and chronological order of the story.
5	Structure	Describes the dramatic arc that a story follows and it elements: actors, story object, themes and events.
6	Cognitive effort	Level of The energy necessary for the user to mentally create a story.
7	Virtuality	The degree to which the activity of storytelling takes place in the real environment of the user or in a virtual world.
8	Spatiality	The impact of (real or virtual) space toward the development of the story.
9	Control	The degree controllability to which the user is able to govern the story's progress.
10	Interactivity	The degree to which the user has the option to be actively engaged in the environment of the story.
11	Collaboration	The option to interact with other users in the creation or experience of the story.
12	Immersion	The degree of immersive which the user is drawn into the story.

Abstract Layer Model displays the relation between dimension of each layer and different level of complexity in categories of digital storytelling. The five categories of DST proposed by Schafer which are related to the Abstract Layer Model are media repositories, story structures, conversational storytelling, emergent stories and lastly, dynamic story.

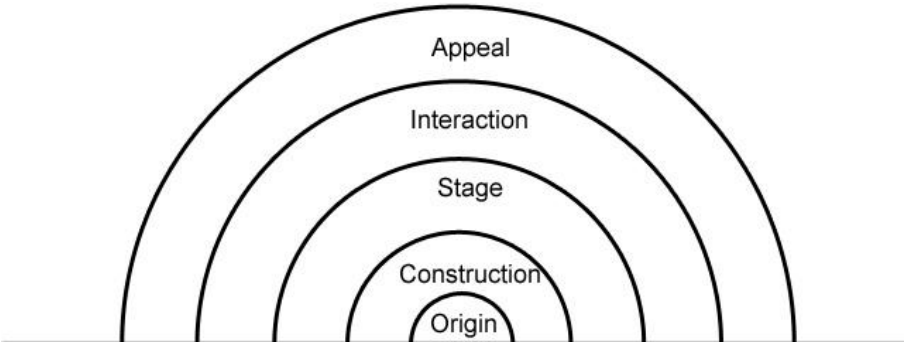


Figure 2.2: Abstract layer model (Schafer, 2008)

The first layer is origin. Origin is mostly related to the source and material of the story. The two dimensions subordinated in this layer are concreteness and user contribution. Concreteness is concern about the origin and type of the source that to be used in constructing a story. The data to construct a story could be simple and abstract data or full detail of the story scenes. User contribution discusses about the role of the user in the story content. User can make contribution to the story structure by interacting with the system.

Second layer of the model is construction. This layer relates to consistency in structure and design of story. Coherence is the first dimension and it talks about the relationship between the stories materials in the story. The coherence of story is higher if the story is revolving base on the storyline set, compare to the story is revolve solely based on user interaction (Schafer, 2008). The second dimension of this layer is continuity. Continuity describes on the smoothness and chronological order of the story. A high continuity story has a smooth flow of the story and no odd event or scene in the story. Structure is the third dimension in construction layer. Structure is about the dramatic arc and story elements: actors, story object, themes and events. A good structure of story has a clear storyline that follows the dramatic

arc; start with a point, rising tension in the middle, and resolve at the end. The story elements are the ingredient throughout the story. Last dimension, cognitive effort is regarding the level of energy necessary for the user to mentally create a story.

The third layer of the Abstract layer model is stage. Stage is about the space of the storytelling takes place. There are two dimensions in this layer. The first is virtuality. Virtuality discusses about the condition of place where the storytelling occurs. It could happen either in real environment or in a virtual environment. The second dimension is spatiality and it measures the impact of real or virtual environment towards the construction of the story.

The next layer is about interaction. The dimension in this layer is about the involvement of user interaction toward the story. There are three dimensions hooded by this layer. They are control, interactivity, and collaboration. Control is regarding controllability to which the user is able to govern the story's progress. However, interactivity is an action which the user able to interact with the environment of the story but the interaction has no effect of the story progress. Lastly, collaboration is about the option of user ability to interact with other users in the creation or experience of the story in storytelling application.

The most outer layer in Abstract layer model is appeal. The dimension in this layer is to measure the effect of the storytelling environment toward the user. The single dimension in this layer is immersion. Immersion discusses the degree of immersive story environment which the user is drawn into the story.

2.4.8 Implications of the Different Elements on Study

The study and analysis of the different sets of elements introduced by the seven experts namely Lambert, Robin, Porter, Salpeter, Ohler, Paul and Fiebich, and Schafer are vital in this study since the effort in identifying the core elements of the DST comes from the literature study conducted. Scrutinizing each element established by the experts provides a platform and space for the researchers to see the patterns exist among the elements of the different experts. The elements that boast commonality are grouped and identified as core elements. Meanwhile the ones that do not possess commonality are discarded based on the researchers' own judgments that they are not strong enough to be required as one of DST core elements. The analysis and elaboration of the core elements and the commonalities are available in Chapter 4. The next section discusses the theories used to support the study conducted.

2.5 Cognitive Load Theory

Cognitive load theory (CLT) is a famous theory in designing an effective learning material. The theory provides the idea of designing an effective learning material based on how human minds work (Plass, Moreno, & Brünken, 2010).

According to Sweller (2010) there are three type of cognitive load: Intrinsic, Extraneous and Germane cognitive load. The intrinsic cognitive load is caused by the complexity of the learning subject, not the design of learning material. Extraneous cognitive load is caused by the ineffective presentation of information.

Germane cognitive load is caused by the usage of the working memory freed from extraneous cognitive load for the cognitive activities of intrinsic cognitive load.

According to Kalyuga (2010), the extraneous cognitive load can be caused by these four situations

a. Learner insufficient knowledge and insufficient guidance, forcing learners to randomly search for a solution.
b. Learner has to mentally integrate the same information between available knowledge with the instructional guidance.
c. "An excessive step-size of change of knowledge base required by the instructional sequence of learning tasks that introduces too many new elements of information into working memory to be incorporated into long-term memory structures (Kalyuga, 2010, p. 54)."
d. Learner has to match the related material that has been spatially and/or temporally separated.

CLT suggested solutions for extraneous cognitive load are applicable to this study. The suggestions applied in the development of conceptual model in this study are as discussed in following section.

2.5.1 Implications of CLT on Study

Two recommendations from Cognitive Load Theory that have been considered for this study are:

i. Eliminate the working memory load associated with having to mentally integrate several sources of information by physically integrating those sources of information.

ii. Eliminate the working memory load associated with unnecessarily processing repetitive information by reducing redundancy.

These recommendations by CLT are used as the main support pillars in the study conducted. There are many elements introduced by experts and seven out of them were identified as the scope of the study. The purpose of the elements is to guide digital storyteller, new and seasoned, in developing a DST in hopes that it would be a good and engaging DST. Nevertheless, there are more than one set of elements and based on the seven sets of elements founded, it appears that some of them are redundant and repetitive. These situations matched with the suggestions by CLT. The first suggestion is that several sources of information may overload working memory and therefore reduce the effectiveness of learning. Adapted in this study, the existence of more than one set of elements of DST to guide the development process is forcing the digital storyteller to make choice of which elements that they would best use. The existence of interactive and non interactive DST complicates matter. The second suggestion says that redundancy may overload working memory with repetitive information. This is also true to the study context where seven sets of elements introduced by experts carry redundant and repetitive elements that guide the same matters. The extraneous cognitive load caused by reading the model may lead to differences in learning and understanding (Figl, Mendling, & Strembeck, 2009). Thus, basing on the suggestions of CLT, finding commonalities of the

elements and grouping them together to become the core elements of DST helps to reduce the burden on the digital storytellers' memory load and help them to understand which elements they should consider include while developing DST. The next section henceforth will discuss on the theories used to support the conceptual model constructed.

2.6 Cognitive Theory of Multimedia Learning (CTML)

Cognitive Theory of multimedia Learning proposes the idea of designing a multimedia message that improves human learning (Mayer, 2005b). Multimedia message is a form of communication conveys through any medium using words and pictures with the purpose to foster learning (Mayer, 2005b). When learning involves multimedia, there are assumptions made in CTML. The three assumptions of CTML are:

i. **Dual channels**. Different channels are involved in processing visual and auditory information.
ii. **Limited capacity**. Each channel has limited capacity in processing at one time.
iii. **Active processing**. Human engage in active learning by attending to relevant incoming information, organizing selected information into coherent mental representations, and integrating mental representations with other knowledge.

Based on the understanding of these assumptions few principles of multimedia learning had emerged. Principles of multimedia learning help to design multimedia presentation on learning environment and the basic principles mostly prove by

evidence based research (Mayer, 2005a). The major principles of CTML are as summarized in Table 2.9.

Table 2.9: Major Principles of CTML (Mayer, 2005a)

Principles	Description
Multimedia	People learn better from words and pictures than from words alone.
Spatial contiguity	People learn better when corresponding words and pictures are presented near rather than far from each other on the page or screen.
Temporal contiguity	People learn better when corresponding words and pictures are presented simultaneously rather than successively.
Coherence	People learn better when extraneous words, pictures, and sounds are excluded rather than included.
Modality	People learn better from animation and narration than from animation and on-screen text.
Redundancy	People learn better from animation and narration than from animation, narration, and on on-screen text.
Individual differences	Design effects are stronger for low-knowledge learners than for high-knowledge learners. Design effects are stronger for high-spatial learners than for low-spatial learners.

These principles are well known principles in CTML. Most of the principles are concerned with reducing cognitive load to helps learners engage active learning. However Mayer, Fennell, Farmer, and Campbell (2004) argue that there are two ways to help students experience meaningful learning. These are:

i. Design multimedia instructional messages in the ways that reduce the learner's cognitive load.
ii. Design multimedia instructional message that increases the learner's interest in multimedia learning.

Mayer (2005c) proposed three principles based on social cues contributed to increase learner's interest in multimedia learning. The principles are based on social cues are summarized in the following Table 2.10.

Table 2.10: CTML Principle based on social cues (Mayer, 2005c)

Principles	Description
Personalization	People learn better when words are in conversational style rather than formal style.
Voice	People learn better when words are spoken in a human voice than in a machine voice or foreign-accented human voice.
Image	People do not necessarily learn better when the speaker's image is on the screen.

2.6.1 Implications of CTML on Study

CTML is an idea presenting how human brain processes multimedia and how the theory helps improve in learning using multimedia. Since DST makes use of multimedia elements to help proliferate the aged old storytelling technique, the CTML is chosen as one of the supportive theory in justifying the core elements identified in the study conducted.

2.7 Minimalism

Minimalist theory is widely used as guideline in producing instruction of training materials. The main idea of the theory is to produce a minimal instructional material and support learner to work with the real task. Subsequently, the concept applied by Carroll (1998) in minimalist theory is 'less is more' and the concept suggests that:

i. Learning materials should be providing modular and meaningful activities.

ii. Learner is encouraged to learn by working on real tasks as from the beginning and throughout the training.

iii. Learning task should able to engage learners and permit learners to learn on their own as necessary.

iv. The learning tasks should be complying with system and error handling should be provided.

To summarize, the theory suggests that the learning task should be modular, meaningful enough to engage the learner. Carroll (1998) argued learner would be troubled with the instruction providing masses volume of information but not so meaningful.

2.7.1 Implications of Minimalism on Study

Base on the deep discussion of DST and judging from the elements of DST founded, it is clear that DST is about being simple, short, and meaningful in conveying the intended message. These reasons alone plainly reflect what minimalism stands for hence, this particular theory is suitable to use as one of the supporting pillars in the construction of the conceptual model.

2.8 Aristotle's Theory

The narrative theory introduced by Aristotle in his book *Poetics* is about tragedy. Tomaszewski and Binsted (2006) described that Aristotle's theory also can be referred to other forms of art. According to Aristotle, these arts are different in the sense of the objects, medium and manner (Tomaszewski & Binsted, 2006). Objects

are referring to the objects involved in the drama. Medium discusses about the media use to perform the drama. Manner speaks of ways the drama performed to audience. There are six elements listed by Aristotle in the context of object, medium and manner. These elements are Plot, Character, Thought, Diction, Song, and Spectacle. Elements are ordered by importance to the tragedy. Many years after the theory was created, Mateas evolved it by modifying its structure. The modified theory is named neo-Aristotelian theory of interactive drama.

2.8.1 A neo-Aristotelian Theory of Interactive Drama

The neo-Aristotelian theory by Mateas (2000) is the successor of the theory of drama by Aristotle and it was modified in the context of interactive element. The modification is due to the role of the new audience that has changed into a player who can interact as a character in the story. Mateas (2000) has added the elements of agency into the Aristotle's theory to enhance the dramatic experience in interactive drama. Mateas' model is shown in Figure 2.3.

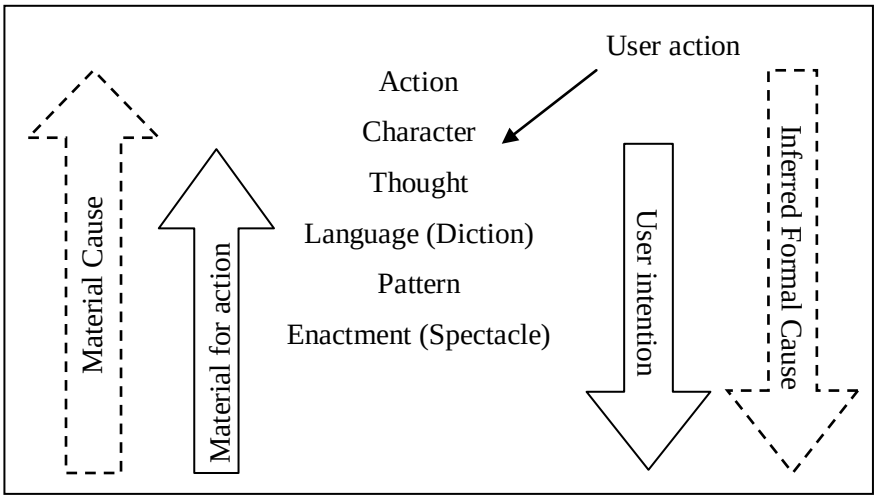


Figure 2.3: Neo-Aristotelian theory of interactive drama (Mateas, 2002)

According to Mateas (2000) the model is borrowed from a model by Laurel (1991, as cited in Mateas, 2000, 2002) that describes Aristotel's theory in the form of interactive context. These models inherit the six elements listed by Aristotle although some of the names are changed to suit the use in human-computer activities. According to Aristotle's theory, the six elements are related by material and formal cause. The material and formal cause are shown in the dotted line arrows in Figure 2.3. The material cause is the material used for something to be created. The formal cause is "the abstract plan, goal or ideal" of something (Mateas, 2000, para.6).

2.8.1.1 Material causal chain

The material cause in drama is the perspective of audience towards the drama. Audience gains the perspective through the enactment experiences. The enactment is formed from the patterns. Patterns are understood as a character action (including language) (Mateas, 2000). According to Laurel (1991) language is not just refer to diction but any "selection and arrangement of signs, including verbal, visual, auditory, and other nonverbal phenomena when used semiotically" (as cited in Tomaszewski & Binsted, 2006). The audience perceives the character's thought from the action and "language" seen. The character is built up based upon understanding of the character's thought. Based on the understanding of all elements, the audience understands the structure and theme of the story.

2.8.1.2 Formal causal chain

The author's view is the formal cause of drama. Author constructed the plot to explain some theme. Character in the drama determines by plot. The character

personality in the drama determines the character's thought. The "language" of the character is determined by the thought. The character's "language" (or action) determines the story pattern. Lastly, the patterns are conveyed into enactment. In a good drama, the audience is able "to recapitulate the chain of formal cause" after the audience understands the story through the chain of material cause (Mateas, 2000, para.5). The audience is able to summarize and gain the message of an author with a good story performed.

Mateas (2000) also added user action into the previous model. For that reason two additional causal chains are applied at character level. These two new causal chains as shown in Figure 2.3 are User intention and Material for action. In interactive drama, the user takes control of the character's role. This makes user intention the new source of formal cause in interactive drama. When users interact in drama, the user's action will affect incident at the language level down to spectacle (Mateas, 2000). However, user actions are also constrained by the material resources afforded in the story and plot determine by the author.

The other contribution of Aristotle is a three-act structure. Aristotle argues that every effective story has a beginning, middle and end (C. H. Miller, 2008). The effective drama is with a story that can provoke emotional purging and relief (C. H. Miller, 2008). Freytag's pyramid is another model of dramatic structure develops by Gustav Freytag. The work of Freytag is described in the context of dramatic structure in the next section.s

2.8.2 Dramatic Structure

Three-act structure by Aristotle is a well known theory and has been used frequently as a basic structure for drama and play. Nevertheless, Freytag's pyramid is a narrative structure model that is also used in drama creation. The model is visualized in a pyramid shape and divided into five parts: Exposition, Rising action, Climax, Falling action and Catastrophe as shown in Figure 2.4.

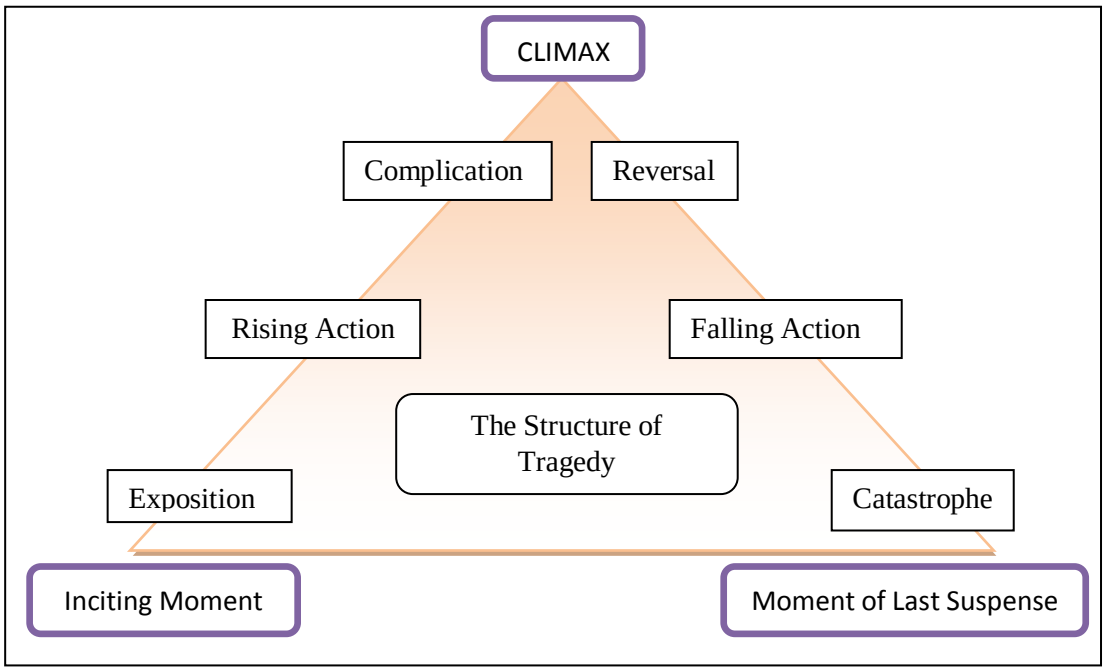


Figure 2.4: Freytag's pyramid (adapted from Wheeler, 2004)

This model has the similar concept of three-act structure (Wise, 1962). "Beginning", exposition is an introductory of the story characters, theme and sometimes even conflict. The introductory exposes the character, information of the story to allow the audience to able to conceptualize the setting and theme of the story. When the exposition completed, the audience is exposed with the hint of conflict to trigger the next phase (Wheeler, 2004; Wise, 1962). "Middle", the rising action is the point

where the conflict evokes the tension of the story. In this phase, if the protagonist (hero) has a winning start over antagonist (villain), it follows by facing more obstacles and vice versa. The tension increases until the story reaches the climax or turning point. Climax is the phase of greatest tension and engages the audience to the story. The protagonist and antagonist are having reversal in their situation. The following phase is known as "End" in three-act structure (Wise, 1962). Falling action is where the tension decreasing as the conflict is resolved. The audience either will feels relief or emotional purging. Catastrophe is the actual end after concluding the event in falling action. It is in this phase is where the solution of the conflict is revealed and display the final situation of the protagonist in the story. Freytag's model is used in both plays of tragedy and comedy. The difference is the situation in both play will be in contrast. In tragedy the protagonist will end with the misery whilst there is happy ending in comedy.

2.8.3 Implications of Aristotle's and Neo Aristotelian Theory to Study

Being a medium to impart wisdom, knowledge, and information, it can never be denied that storytelling is the main component in the whole picture. Similar to other medium such as drama, soap opera, and comedy, DST has something to achieve and tell. To ensure that the DST is appealing and lingers in the audiences mind long after watching it, there must be a structure that guides the flow of the story from start to finish. This is when both theories play their roles in the study. From the literature review conducted, basically it can be perceived that having a proper story arc is good for DST development since it organizes the story into a proper structure and guided the audiences' attention and suspense. Judging from the explication of both

Aristotle's and Neo Aristotelian's theory, it is obvious that these theories supported the fact that it is necessary for a story to have a particular structure and elements to establish a strong foothold in engaging the audiences' attention hence both are applicable in supporting the development of the conceptual model. Next section explains the Model of Storylistening Trance that has also been used to support the conceptual model developed.

2.9 Theoretical Model of Storylistening Trance

Story listeners some time usually would enter another state of consciousness that make the story feel almost real and live when they are engaged to the story. Sturm (2000) identifies this state of consciousness as "storylistening trance". Sturm presented a theoretical model of storylistening trance as shown in Figure 2.5. The theoretical model is developed based on the analysed data collected in the interview conducted on the participations of an organized storytelling event.

The research conducted by Sturm has revealed three sources of audience listening traits that influence the quality of the story delivers. The sources are characteristic, influence, and distractions of storylistening trance. The first source is characteristics of storylistening trance. The data collected had exposed six characteristics which are *realism, lack of awareness of surroundings, engaged receptive channels, lack or loss of control, placeness, and time distortion*.

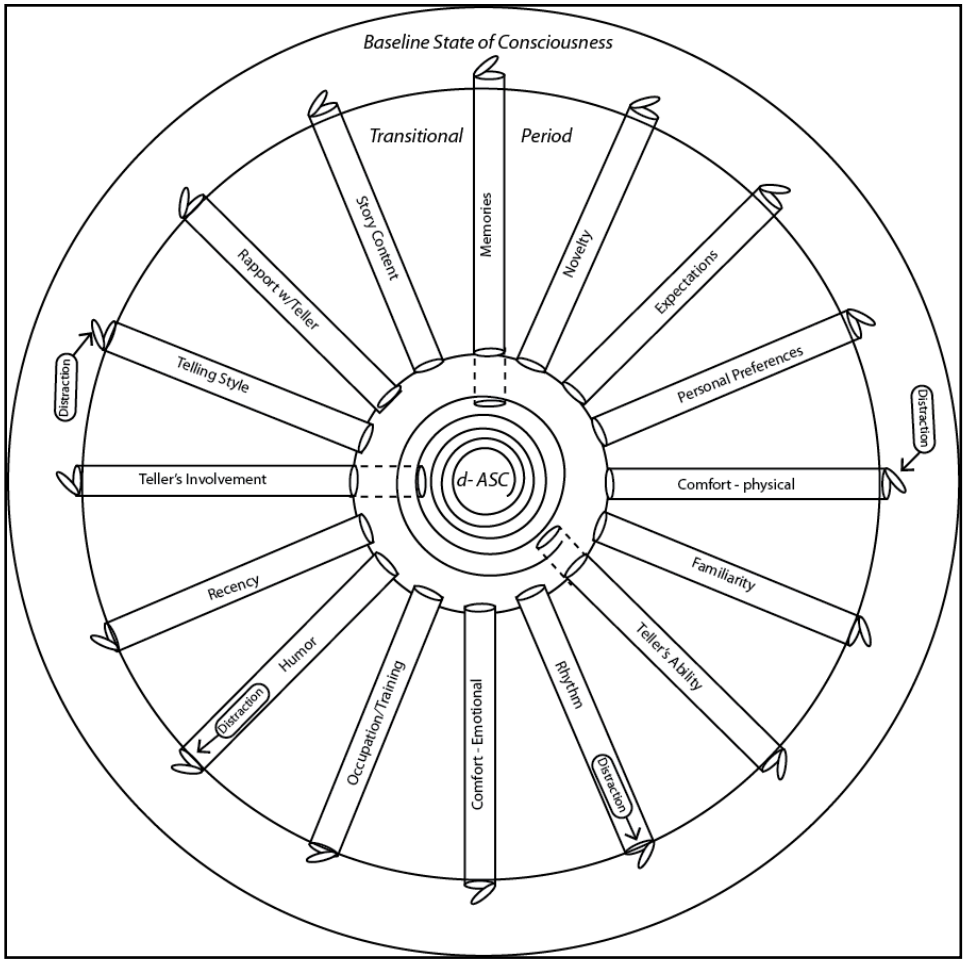


Figure 2.5: The Storylistening Trance Theoretical Model. (Sturm, 2000)

Realism to the audience listening to a story told is about becoming one with the story and the characters in it. Good storytelling would be able to transmigrate the audiences' consciousness from reality to the story world. The sense of realism is different to the individual. Some are affected by strong empathy and some are connected to a very similar past experience. This leads to the second characteristic which is lack of awareness of surroundings.

Based on the responds of the audiences of the events, Sturm concludes that once the sense of realism kicks in, the audiences will detach themselves from their

environment on three levels. The first level is they simply tune in to the story but still having sense and reflect on the surroundings. Secondly, the intensity of the focus is higher since the surrounding was described as dissolved and the sense of responsiveness to it is faded. The third level is the strongest since it talks about being absorbed into the story world wholly and falls into the narrated surrounding.

The third characteristic discusses about the way the storyteller can reach to the audiences using a proper receptive channel. It is stated that there are three external ways and one internal way to reach and touch the attention of the audiences. The external ways are visual, auditory, and kinesthetic whereas the internal way is mental visualization. Visual channel is about the effect of the movement made by the storyteller such as hand of facial movement that affects the audiences' focus. Auditory channel is the words utter by the storyteller successfully grasped the audiences' listening focus while kinesthetic channel is engaged when the contact is made from the storyteller to the audiences via touch or sound wave. As for the internal channel, it is entirely dependent on the audiences' mental capability to imagine and visualize the story told alive with images and emotions and if succeed, usually the response would be mirrored externally by smiles and laughter as such.

The fourth characteristic is lack or loss of control. This characteristic is classified into two perceptions which are active and passive. The active perception happens when the audiences have the power to decide whether to be immersed in the story or the other way round. They have the ability to control themselves either to be lost in the story or just be a spectator from the outside. Meanwhile, the passive perception occurs when the audiences lack or do not have control over the intensity of

immersion into the story. Their focus and attention are handed to the storyteller due to the skilful art of storytelling.

The fifth characteristic is placeness and it has strong relation with the previously explained characteristics. Placeness is about being in the story not beside or surrounding it. Based on Strum's interview with the audiences of the events, placeness is about the quality of the space in the story. Good storytelling would hold the audiences in the story encircled by the story's characters and environments.

The final characteristic identified by Sturm is time distortion. This characteristic regards the audiences' perception of time is listening to a story. From the data collected, Sturm surmised that the brevity and longevity of a story listening experience is dependent on the individual. Some feedback stated that longer story seemed so short and vice versa showing that time has been distorted while listening to the story. Time distortion does not reflect the quality of a story. As an example, the longevity of a short story does not necessarily show that it bores the audience. Some audiences responded that short story becomes longer because it immersed the audiences in it and takes on a long interesting journey that they felt the story is longer than due.

The second source is positive influences that enhance the storylistening trance. There are eight influences identified by Sturm. They are *storytelling style, activation of listeners' memories, sense of comfort or safety, story content, storyteller's ability, storyteller's involvement, and rhythm.* The first influence is storytelling style. Summarizing the data obtained from the interview, Sturm concludes that there are

three factors that closely pertain to this very influence which are descriptive style, vocal style, body language style, and appropriate for the audiences. Descriptive style is the ability of the storyteller to tell the story descriptively to the point where the audiences are capable to digest the story and visualize it with mental image. As for vocal style, it represents the storyteller's sensitivity and realization to the mood of the story to adapt his vocal style in terms of volume, character voices, and accents. Apart from the vocal itself, storyteller needs to create movement to influence the audiences' mental image in listening to the story. The movement could be exaggerated or subtle depending on the situation of the story told. Lastly, the audiences also felt that the storytelling style must fit to their requirement for them to really enjoy it. Three aspects dictate the appropriateness factor. The first one is the style of the story told must be similar to what they had experienced. Secondly, the pace of the storytelling style must match of the pace of the listening. The third and the last is that the utterance style must be easy and comfortable to the ears of the audiences.

The second influence is activation of listeners' memories**.** Good storytelling would often trigger audiences' past memories that subsequently contribute to good storylistening trance. Audiences that successfully connect between memories and the storytelling would often experience storylistening trance that integrates living in the story and reliving the memories. The audiences responded that there are three types of memories. The first one is memories of distant past. This type of memory is usually rooted to the childhood age where occurrences can be related to the story. Secondly it is called memories of past experiences of stories. This memory is about

the similar story that has been exposed to the audience a long time ago and listening to it again triggers memories. Basically the story becomes a memory marker in their life. The third memory is memories of recent or ongoing event and it is about the similarity of the circumstances and occurrences in the story with the things that are happening or just happened to the audiences in their life. The audiences somehow could identify with the story characters and flows.

The third influence is sense of comfort or safety**.** It is imperative for the audiences to feel comfortable and secure in order for them to enjoy listening to a story and be in trance like state. There are three types of interrelated comforts in storylistening. They are personal, communal, and physical comfort. Personal comfort is about the audiences individually feels comfortable internally while enjoying the story without having to care about the surroundings. Communal comfort relates to the need of the audiences to be in a community or group of story listeners to enjoy a story. This is due to the fact that being among a group of people they can dissolve and enjoy the story without being the focus of attention. Physical comfort is composed of health and setting. The audiences' health can influence the level of trance in listening to the story. Good health promotes comfort hence higher level of trance. Good setting also has its role in elevating comfort which affects the trance state of the audience. Setting describes the environment where the audiences are in while listening to the story. A hall where good air ventilation and audio system are installed promotes good setting while hot and humid room ensue discomfort among the audiences.

The fourth influence is story content and it is considered as one of the pivotal influences in storylistening trance. This is due to the fact that when the audiences

shut off themselves from the surroundings, what's left is the story. Therefore, good and engaging story content is necessary to keep them in trance like state. According to the audiences interviewed, there are four imperative elements involved in the influence. The first one is the type of story. The suitable type of story touches the very being of the audiences. The second and third ones represent the subject and theme of the story. In the case where both of these elements matches the audiences' interest, the influence would become stronger. The fourth element is the emotional colour of the story. Story that burdens emotions would attract and engage the audiences that feel the emotion portrays or have been on such emotional roller coaster before. One of the audiences says that the right integration of these elements would entangle them in the story content.

The fifth influence is storyteller's ability. Many audiences are captivated by the storyteller's ability to tell story and perform lively making the story engaging and attracting. Sturm states that the participants of his interview responded the ability of the storyteller made them fell deeper into the story. Good storyteller comes with the ability to take smallest matter and exaggerates it and the biggest matter and tones it down. This act will ensure the audiences to be in awe and have high expectation of the storyteller for future events.

The sixth influence is storyteller's involvement. It is imperative for the storytellers tell the story that they love and like because by loving and liking the story they tell, they would be more involved in the process. This is an important measure because the audience can tell and feel the passion and honesty of the storytellers in narrating the stories. Faking the involvement in the story would only detach the audiences

from the story world hence disrupting the trance. Having said that, it is important for the storytellers to tell personal narrative storytelling since they would be more involved and care about the story. The emotion of the storyteller would also be invested and reached the audience. Nevertheless, it does not mean that the story is restricted to personal event. Other interest such as folktale and legend would make a good story. As long as the storytellers show deep interest and tell the stories as if they were their own piece, the honesty and emotion would be transparent to the audiences and it clearly shows that the level of involvement in the story.

The seventh influence is rhythm. Rhythm is a pattern of movement. Based on the interview by Sturm, the audiences did not utter literally that rhythm of the story does influence storylistening trance. They digressed from the concept of rhythm but basically the explanation given reflects rhythm. One of the answers given was the trance state happens when they were captivated by the story and synchronize with it. When the pace of the story is similar if not equal to theirs that is when the story starts to influence. Judging from the responses provided, it is clear that the audiences were referring to their rhythm instead of the rhythm of the storytelling. Another respond regarded rhythm as the flow of the story. It was noted that the audiences stay with the story as long as there is no disturbance such as mistakes in the words of the storyteller. Plainly it can be interpreted that the flow of the story is the rhythmic movement of it.

Apart from the six influences elaborated above, there are other influences that were not so popular among the respondents but using his own perception as a researcher, Sturm deems it as vital since he inserted these influences as part of the theoretical

model. There are seven other influences as mentioned by Sturm (2000). The first one is the listener's personal preference. This influence merely states that the audiences listen trancelike when the story told relates to the topics that they love. The second influence is the listener's occupation. Occupation does leave an impact on the state of trance in listening to a story. Based on the data on the interview collected, it is revealed that the listener that assumes the job of an educator such as a teacher would tend to be critical and analyses of the story and hence depletes the trance state of the listening experience. Next is the third influence that discusses about the affinity between the listener and the storyteller. The audiences stated that if the similarity between them and the storyteller existed, the listening process would be more engaging and trancelike. One of the examples given is age. The similarity of both the listener and storyteller ages would create a rapport and consequently, a trancelike listening of the listener. The fourth influence would be the novelty or familiarity of the story told. This influence is about the listener and his comfort zone. The audiences said that they would listen and focus to a story better if they had some previous knowledge of the story. Humour takes the role of the fifth influence. The sense of humour of the storyteller does have an impact of the listener's trancelike state. A storyteller born with a natural sense of humour would be able to attract and engage the audience naturally without much effort to be visual. This endeavour would augment the audiences' involvement in the story as the funny moments were weaved in the storytelling and storylistening seamlessly. The last one is the *sense of recency*. This last influence depicts that the audiences prefer a latest story told by the storyteller. The latest story would keep the audiences wanting to know more of the

story hence heightens the storylistening trance. Thus, the storytellers must always keep their story fresh and recent.

The third source is the negative influences that lessen the storylistening trance experience of the audiences. Sturm favours them as distractions. There are five distractions identified by the audiences which are *visual and auditory, kinaesthetic, technical, durational, and rhythmic.* The first distraction is visual and auditory. Both distractions can be divided into two types which are physical and mental. Physical visual distraction is rooted from three sources. They are the environment, storyteller, and storytelling. Physical environment distraction is triggered when some physical activities happen in the audiences' surrounding that steals their focus from the story. As for the storyteller, they distract the audiences' trance experience when their physical features are not to the audiences liking hence distracting them from listening to the story well. Additionally, overdoing in telling the story such as overuse of facial expression could distract the audiences too. Mental visual distraction starts to happen when the audiences have trouble visualizing what the storytellers had pictured happening in the story. Once they failed to do the visualization it becomes a distraction to engage with the story.

Auditory distraction can be just as disturbing as the physical one and it is also divided into two types which are physical and mental. The roots of physical auditory distractions are also equal of the physical visual distraction. Auditory environment distraction refers to the sound and noise in the surroundings that disturbs the audiences from listening to the story. As for the storytellers, the mistakes that they made in telling the story such as pronunciation are deemed a distraction by the

audiences. Apart from that, the pace of the storytelling can also affect the extent of distraction to the audiences. If the pacing of the storytelling does not match with the pacing of the listening, then the audiences are considered as distracted. Mental auditory distraction forms the internal distraction of the audiences. It involves their inability to focus on listening to the story due the mind kept drifting away to other matters in their life.

The second distraction is kinaesthetic. The source of this distraction originated from the audiences' body and it pertains to being comfortable while listening to the story. Having flu and fever while listening, for example, could perturb the audiences' storylistening trance.

The third distraction is technical. Technical distraction can be related to physical auditory distraction. The weakness in the storyteller technical style in telling story can affect the audiences' involvement in the story. Unnecessary long pause, mispronunciation, and exaggerated limb movement could contribute to the factor.

Durational is the fourth distraction. The audiences responded that a story that is too long without being necessary is distracting when the audiences stop getting involved and start asking 'when will the story ends?' One of the responders plainly stated that having a story structure helps to organize the story hence giving some hints to the audiences that the end of the story exists.

The last distraction identified is rhythmic. There were few different feedbacks obtained from the audiences. One of them said that the distraction happens when his

internal rhythm is not at par with the storytelling rhythm and this would leave him perplex of the direction of the story. The other audience responded that rhythmic distraction has two aspects. The first one unneeded break and the second one is monotonous rhythm. The right pause and stop in storytelling can help paint the story alive. Nevertheless, if the pause and stop were caused by anxiety, nervousness, and other undue reasons, it would disturb the flow and rhythm of the story hence distract the audiences' involvement.

Monotone vocalization is helpful in achieving trance state in hypnosis but it is the opposite in storytelling. Monotonous storytelling is bad because it indicates that the storyteller reads a story instead of narrate a story. A good storytelling that engages the audiences colours their ears with different rhythm of voice. This act will not only put the audiences in trance but also differentiate storytelling from a prerecorded message.

Based on the three sources elaborated which are characteristic, influence, and distraction, Sturm has proposed 16 elements of storylistening trance as depicted in Figure 2.5. The elements were extracted and identified from the many responds obtained from the three sources aforementioned. The outcome reveals 16 elements as the following:

1. Memories
2. Novelty
3. Expectations
4. Personal preferences
5. Comfort-physical
6. Familiarity
7. Teller's ability
8. Rhythm
9. Comfort- emotional
10. Occupation/training
11. Humor
12. Recency
13. Teller's involvement
14. Telling style
15. Rapport with teller
16. Story content

2.9.1 Implications of the Storylistening Trance theoretical model on study

Sturm has done a wonderful job in explicating the requirements that a storyteller need in order to ensure that the audiences are captivated by the story told. It is even better that he studied the perspective mostly from the view of the audiences instead of the storytellers themselves. All of the elements identified from his study have revealed factors that should be pondered by storyteller in crafting and telling story. The theoretical model constructed by Sturm is definitely helpful in supporting the elements identified in this study. Even though these two studies are different in terms that Sturm focuses on the listeners' listening trance and this study is on the DST development itself, eventually it is about the listener getting the message and being engage to the story. Storylistening trance model grounded the study by supporting some of the elements identified that relate to the engagement of the audience to DST. This theoretical model marks the last supporting pillar to justify the elements proposed in the study. Next section would explain Iterative Triangulation Methodology that has been used to guide the steps involved in conducting the study.

2.10 Iterative Triangulation Methodology

The model of Iterative Triangulation Methodology (ITM) is proposed by Lewis (1998) to enhance the Operations Management theory development methodology. The iterative triangulation process utilizes systematic iteration of literature review, case evidence and intuition. This process aims to help researcher to develop a valid theory through "a rigorous process and explicit technique for comparing diverse case setting" (Lewis, 1998, p. 456). The processes in Iterative Triangulation Methodology are illustrated in Figure 2.6.

2.10.1 Groundwork Phase

In ITM, the processes of theory development start with a well defined framework to enhance the quality of the theory develop. In this phase, the research questions, constructs of interest, and case search strategies and selection criteria established a framework to guide the study.

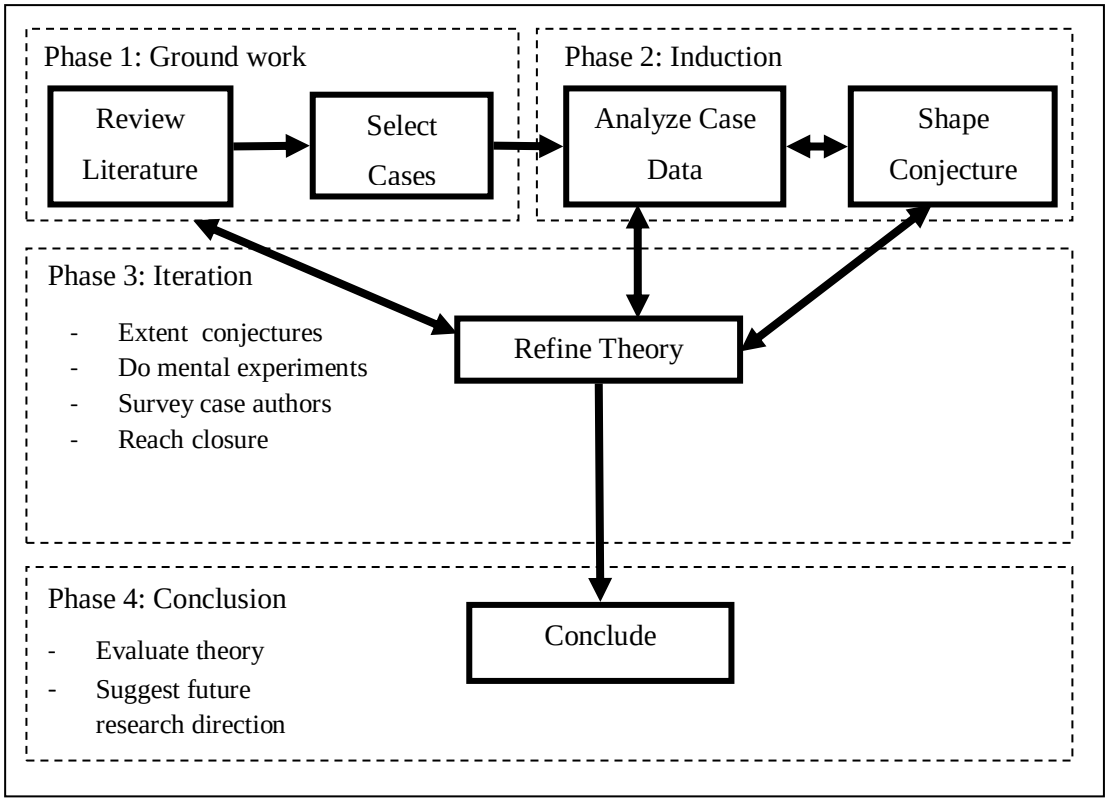


Figure 2.6: Iterative Triangulation Methodology (adapted from Lewis (1998))

Two main activities in this Groundwork phase are:

- **Review Literature**. Literature review is a process of reviewing various and relevant literature as in the initial stage of research preparation. The understanding of the strengths and gaps from the existing literature helps the researcher to specify the research question and provide review framework of

the research. The review framework will be useful for the process in later phase, by "suggesting potential sources for increasing case diversity and providing a means of enhancing conjecture heterogeneity" (Lewis, 1998, p. 460).

- **Select cases**. Select case is the process of specifying case search strategies and case selection criteria. Task of an extensive search for cases needed search strategies to increase the case size and diversity. However, the cases selection is bounded by the specific selection criteria to ensure the information is sufficient for the research purposes.

2.10.2 Induction Phase

Induction phase is where the process of analysing collected data to identify patterns among the data found in the text and shape an illustrative representation of the relation within and across cases. This phase consists of two steps:

- **Analyze case data.** Analyze the data using open coding to identify and categorize the elements from the text according to pattern and consistencies.
- **Shape conjecture**. The pattern discovered in the analyses phase helps shaping the initial conjectures.

2.10.3 Iteration Phase

In iteration phase, the mental experiment is conducted by iteration process involving researcher's experience and assumptions, reviewed literature and case data to evaluate conjectures. During this process the conjectures are strengthen by building

up connection with the existing case data and reviewed literature. In addition, Lewis (1998) confers surveying case authors as an approach to gain additional details not enclose in the case data and to evaluate the conjectures. The iteration process however acquired to reach closure at a certain point. Closure is reached when the developed theory provides a coherence understanding of a case (Lewis, 1998).

2.10.4 Conclusion Phase

In the conclusion phase the two activities involved in accomplishing the theory development are: evaluating theory, and future work suggestion. Lewis (1998, p. 466) mention that theory evaluation is to "appraises its utility to researchers and practitioners". Consequently the researcher should outline the theoretical and methodological limitations for future study (Lewis, 1998).

2.10.5 Implications of ITM on study

This methodology is adapted as an outline for the research study and conceptual modelling process. In this study, the development of the conceptual model is based on existing DST models and literature review. As mentioned by Lewis (1998), various author perspectives of the study subject can be effectively observed through existing case studies. Apart from that, the most important reason to adapt this methodology is the iterative triangulation process. This approach helps clarify concepts and develop an inclusive framework to represent the complexity and dynamic subject of study in reality (Lewis, 1998). The last following section is going to elaborate the method used to obtain the feedback of DST experts on the elements proposed.

2.11 Expert Review

Molish and Jeffries (2003) argue that expert review is an informal method used one or more usability expert to evaluate a user interface. Aside from that, expert review also used to evaluate questionnaire (Olson, 2010). Expert review is an evaluation method mostly used to evaluate and improve the user interface of a product or prototype based on the experts' experience such as heuristic evaluation and formative evaluation.

Heuristic evaluation is used to examine the usability of user interface design based on usability principles or the 'heuristics' (Fu, Salvendy, & Turley, 2002; Nielsen, 2003). Korhonen, Paavilainen, and Saarenp ää (2009) is concurred with Molish and Jeffries by mentioning heuristic evaluation is an expert review, "since the evaluators' experience and knowledge will affect the evaluation results. (p.75)" In heuristic evaluation, Nielsen and Molich (1990) suggested to use three to five evaluators. According to him one person is not able to find the entire problem in an interface; however the increase in evaluator number does not able to increase the results (Nielsen, 2003; Nielsen & Molich, 1990).

In Formative evaluation on the other hands, expert review is an evaluation method suggested by Tessmer for evaluate and improve instruction design. Tessmer remarks expert review is "an intrinsic evaluation of the instruction, meaning that the focus is on the instruction's content accuracy or technical quality, rather than on learner performance or overall effectiveness (as cited in Ogle, 2002, p. 13)."

2.11.1 Implications of expert review on study

Expert review was used to assess the core element of DST from the perspective of interactive DST and non-interactive DST. The experts with more than five years experience in handling DST were selected to review the conceptual model and the elements it represents. Since this study does not produce a prototype or user interface, the expert reviews conducted would not be applying the usability principles as in heuristic evaluation. The heuristics for the experts to review the elements were constructed based on each of the elements proposed. The heuristics along with the conceptual model were the kits for the experts to pass their review whether the elements proposed were agreeable or not in order to be included as core elements of DST. Detail explanation of expert review conducted is in Chapter 5.

2.12 Evaluation of conceptual model quality

Due to the unavailability of practical evaluation framework for the quality of conceptual model, Maes and Poels (2006) adapted Seddon's information system successful model (2004) into conceptual model context to develop a quality evaluation model. Furthermore, a measurement instrument to evaluate conceptual model based on user perception was produced based on the framework. The construct of the instrument is the result of a comparison process between Seddon's information system successful model with Krogstie et al.'s (1995) framework of conceptual model quality (as cited in Maes & Poels, 2006). As shown in Table 2.11 the construct proposed by Maes and Poels to evaluate quality of conceptual model are: Perceived ease of understanding (PEOU), Perceived usefulness (PU), User satisfaction (US), and Perceived semantic quality (PSQ).

Table 2.11 Measurement instrument for the PEOU, PU, US and PSQ constructs

$PEOU_1$	It was easy for me to understand what the conceptual model was trying to model	**PU_1**	Overall, I think the conceptual model would be an improvement to a textual description of the business process
$PEOU_2$	Using the conceptual model was often frustrating	**PU_2**	Overall, I found the conceptual model useful for understanding the process modelled
$PEOU_3$	Overall, the conceptual model was easy to use	**PU_3**	Overall, I think the conceptual model improves my performance when understanding the process modelled
$PEOU_4$	Learning how to read the conceptual model was easy	**PSQ_1**	The conceptual model represents the business process correctly
US_1	The conceptual model adequately met the information needs that I was asked to support	**PSQ_2**	The conceptual model is a realistic representation of the business process
US_2	The conceptual model was not efficient in providing the information I needed	**PSQ_3**	The conceptual model contains contradicting elements
US_3	The conceptual model was effective in providing the information I needed	**PSQ_4**	All the elements in the conceptual model are relevant for the representation of the business process
US_4	Overall, I am satisfied with the conceptual model for providing the information I needed	**PSQ_5**	The conceptual model gives a complete representation of the business process
Legend			
PEOU	Perceived ease of understanding	**PU**	Perceived usefulness
US	User satisfaction	**PSQ**	Perceived semantic quality

(Source: Maes and Poels, 2006)

PEOU evaluates the degree of the model in the context of information correctness and ease of interpretation and understanding. **PU** measure how useful the model as perceived by the users. **US** evaluates overall satisfaction of users with the model concerning its purpose. **PSQ** allows users to evaluate the validity and completeness of the information convey by the model to serve its purpose with respect to the related domain.

Maes and Poels also produced measurements for these constructs and validated them in two empirical experiences to assess the reliability and validity. According to Maes and Poels (2006), the measurement instrument can be used as a tool to evaluate and compare the quality of conceptual models based on the perception of users. It was also mentioned that the instrument can be adapted to other domains, by applying changes on the wordings to suit the particular domain.

2.12.1 Implication of Conceptual Model Quality Evaluation on Study

This study adapts the measurement in Table 2.11 in evaluating the quality of the proposed conceptual model. For that purpose, the wordings of the measurements have been changed to suit the purpose to evaluate the conceptual model of DST as shown in Table 2.12. The proposed conceptual model was evaluated by the potential users to obtain the quality measure of the conceptual model.

Table 2.12 Construct and Measurement for conceptual model quality evaluation

$PEOU_1$	It was easy for me to understand what the conceptual model was trying to model	**PU_1**	Overall, I think the conceptual model would be an improvement to a textual description of the DST core elements
$PEOU_2$	Using the conceptual model was often frustrating	**PU_2**	Overall, I found the conceptual model useful for understanding the core elements of DST
$PEOU_3$	Overall, the conceptual model was easy to use	**PU_3**	Overall, I think the conceptual model improves my performance when understanding the core elements of DST
$PEOU_4$	Learning how to read the conceptual model was easy	**PSQ_1**	The conceptual model represents the core elements of DST correctly
US_1	The conceptual model adequately met the information needs that I was asked to support	**PSQ_2**	The conceptual model is a realistic representation of the core elements of DST
US_2	The conceptual model was not efficient in providing the information I needed	**PSQ_3**	The conceptual model contains contradicting core elements
US_3	The conceptual model was effective in providing the information I needed	**PSQ_4**	All the elements in the conceptual model are relevant for the representation of the core elements of DST
US_4	Overall, I am satisfied with the conceptual model for providing the information I needed	**PSQ_5**	The conceptual model gives a complete representation of the DST core elements
Legend			
PEOU	Perceived ease of understanding	**PU**	Perceived usefulness
US	User satisfaction	**PSQ**	Perceived semantic quality

2.13 Literature Overview Diagram

The main components of the literature study are: DST background, Categories and genres of DST, Experts and elements, Theories, Review and evaluation methods, and lastly the Iterative triangulation methodology which is the locus of the diagram. This is due to the fact that ITM guides the entire process of the study being conducted.

The structure of the literature study has provided the identification of the focus of study. The diagram of the literature study structure is as illustrated in Figure 2.7.

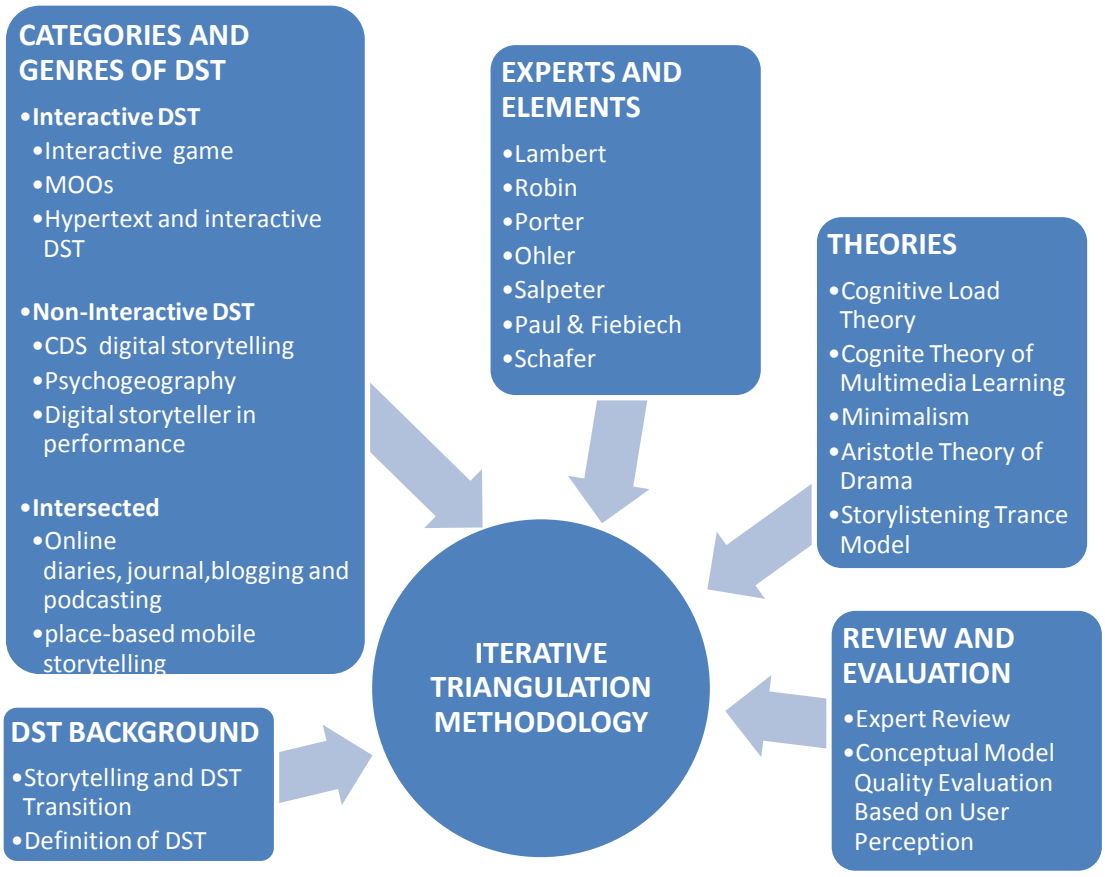


Figure 2.7: Overview of literature study

2.14 Summary

This chapter has elaborated the issues and topics that pertains and supports the entire study in general. The implications of the each of the issues and topics on the study conducted are elaborated too. The chapter began with a little journey to the root of DST which is storytelling and then back to the modern days where technologies amplified storytelling to become DST. Afterwards, the experts were identified and the sets of elements introduced by each of them were dissected and discussed in

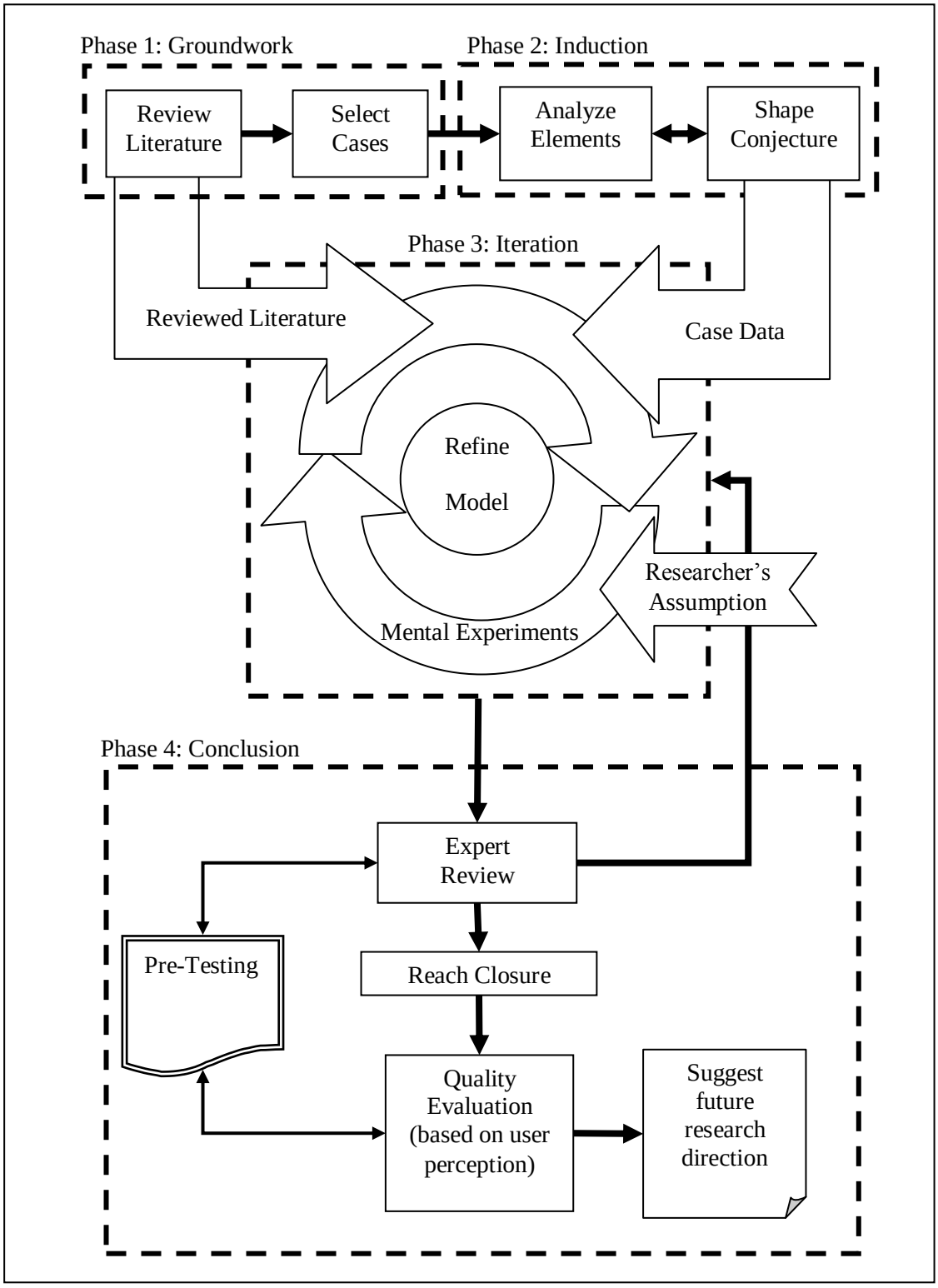
details to give insights into the starting point to the identification of the core elements proposed. Ensuing was the discussion of the main theory used as supporting pillar of the research gap identified and also the theories and model utilized as the spokes supporting the conceptual model constructed. The methodology adapted for the entire study was later enlightened and this chapter ends with some explanation regarding the method used to review and evaluate the core elements proposed by the acknowledged experts and users respectively. Next chapter will discuss and elaborate the methodology adapted for the study in details.

CHAPTER THREE
METHODOLOGY

3.1 Chapter Overview

This chapter describes the phases of the methodology in conducting this study. Methodology is crucial in ensuring that the process of conducting the study is systemic and eventually leads to answering the research questions and achieving the research objectives. The phases of the methodology were adapted from Iterative Triangulation Methodology (Lewis, 1998). Judging from what the methodology aims to achieve, the essence of the phases is similar to what the study tries to accomplish (refer to Figure 3.1). This study proposes core elements of DST as a guide to DST development by comparing and contrasting existing sets of element of DST.

Mainly the phases are similar to the original methodology except that instead of working on novel theory, the study works on constructing a conceptual model representing a new set of core elements of DST. The obvious phases that were altered are Phase 3 and Phase 4 which stand for Iteration and Conclusion respectively. The original unaltered Iteration phase is about the repeating cycle of refining the theory in development and the cycle stops once the Iteration phase reaches closure and moves to Conclusion phase. The last phase is supposed to be evaluating the completed theory and suggesting the future directions of the particular study conducted. Nevertheless, those two phases had to be adapted to suit the study's need in proposing the conceptual model. The repeating cycle in Iteration phase does not stop once the Conclusion phase begins.



(adapted from Iterative Triangulation Methodology (Lewis, 1998))

Figure 3.1: Methodology Processes

This is due to the fact that for this particular study, evaluation of the conceptual model is judged by the review of the experts and users. The instrument used in both phases undergone pre-test process in order to validate the items used. Once the output of the review is gained, the cycle of refining the conceptual model starts again which means the process goes back to Iteration phase. The proposed conceptual model is deemed to be reaching closure, once the refinement process has been completed. The conceptual model has arrived at the saturation point when it has been moulded into the final form. Based on this fact, the methodology was adapted. The details of the works done in each phase are elaborated in the following subsections.

3.2 Groundwork

This very first phase is composed of two vital sub phases which are review of literature and selecting cases. The study was started by performing an exhaustive literature study. Multiple legit and credible sources pertaining to DST such as books, journals, proceedings, blog, and professional and non-profit websites were read, analyzed and referred in order to obtain a clear perspective on the study's direction and background out of the pool of DST domain. The background and root of DST were thoroughly researched to get a lucid beginning of DST which is certainly storytelling. By reading on storytelling and how technology bridges the gap between it and DST enhanced the researchers' comprehension on how DST commenced. Apart from that, the information on people who triggered the culture and the birth of DST were also excavated. This was done to ascertain the pioneers of DST who were responsible in pulling storytelling across its technological boundary. Moreover, people who carry the tradition of the pioneers were also studied in an effort to trace

and follow the evolution and future development of DST in any possible domains affected by it. Some of these people inclusive the pioneers are deemed as experts in DST from the researchers' point of view when they introduced elements of DST that act as a guide in DST development. These elements are the models that the users can refer to whenever the need to develop a DST arises.

Base on these models, analysis was made and these models are the cases of the study conducted and became the starting point of where the research gap was solidified. The identified elements of DST, and the experts clearly, were selected after the review on the reading materials were done exhaustively. The selected experts and their set of elements can be further read in Chapter 2 that elaborates the literature study conducted in details. In an effort to fortify the study, review was also done on ground theory that supports the gap of the study ascertained and as well as the supportive theories, models and concepts that justify and safe guarded the conceptual model proposed. These theories were explained in details and its implication on the study generally and the conceptual model proposed specifically, were explicated. Apart from the theories, the methodology elected which is Iterative Triangulation Methodology was also examined. The primary purpose of the methodology was generally explained along with its phases. Afterwards, the evaluation on the conceptual model was reviewed. Since the conceptual model was reviewed via expert review, the method was explained to acquire broad idea on how it is conducted. At the end of this phase, all these literature studies performed was moulded towards the gap of the study and the cases selected to assist in identifying

the core elements of DST. Next phase is Induction and basically it is about analyzing the cases selected.

3.2.1 Unit of Analysis

There are two main units of analysis which are groups and social artifacts. The groups are the experts of DST that reviewed the elements of DST and the potential users (experienced and non-experienced users) that evaluated the conceptual model while the social artifacts are the books and articles that the researcher had analyzed to gain the pattern of commonality of the DST elements. Both units of analysis are crucial to the study. The data collected from the experts and potential users helped greatly in improving and validating the conceptual model generally, and the core elements specifically. The experience and non-experienced users were involved in the evaluation in order to assess if there was any significant differences between these two groups. Meanwhile, the information gathered from studying the various social artifacts pertaining to DST exposed the different sets of elements introduced by distinctive experts. By investigating and comparing the different sets of elements thoroughly, the specific patterns of elements emerged and this provided an opportunity to cluster the elements of similar pattern together to become a core element of DST.

3.3 Induction

Induction forms the second phase of the methodology adapted in the study. This very phase is built of two sub phases which are analyzing the cases and shaping the conjectures. The phase started with continuing what has been done in the first phase

which is the Groundwork. Based on the literature study performed and the cases selected, all these information were analyzed. There were eight experts found with their own set of elements identified as stated by the scope of the study. These sets of elements were then populated in the table and in an effort to extract core elements of DST from those elements, the commonality between the elements was sought and it is as shown in Appendix A.

The commonality of the elements was evaluated and assumed by the similarity of an element's definition in explaining its purpose in DST development. Similar elements were proposed as new core elements of DST then grouped together under four different yet related clusters adapted from Schafer's DST Reference Model (Schafer, 2008) and abiding the scope stated, the clusters were divided further more into two categories of DST which are non interactive and interactive DST. Further explanation regarding this process along with the commonality stated in Appendix A can be found in Chapter 4.

Soon as the core elements were identified, shape conjectures sub phase came into role. This particular phase serves in the creation of the initial conceptual model of core elements of DST. The core elements identified together with the clusters and categories were designed visually into a particular appropriate shape selected by the researchers. This initial conceptual model is as depicted in Figure 3.2. Once the initial conceptual model was completed, the next phase, Iteration, would serve to refine it iteratively.

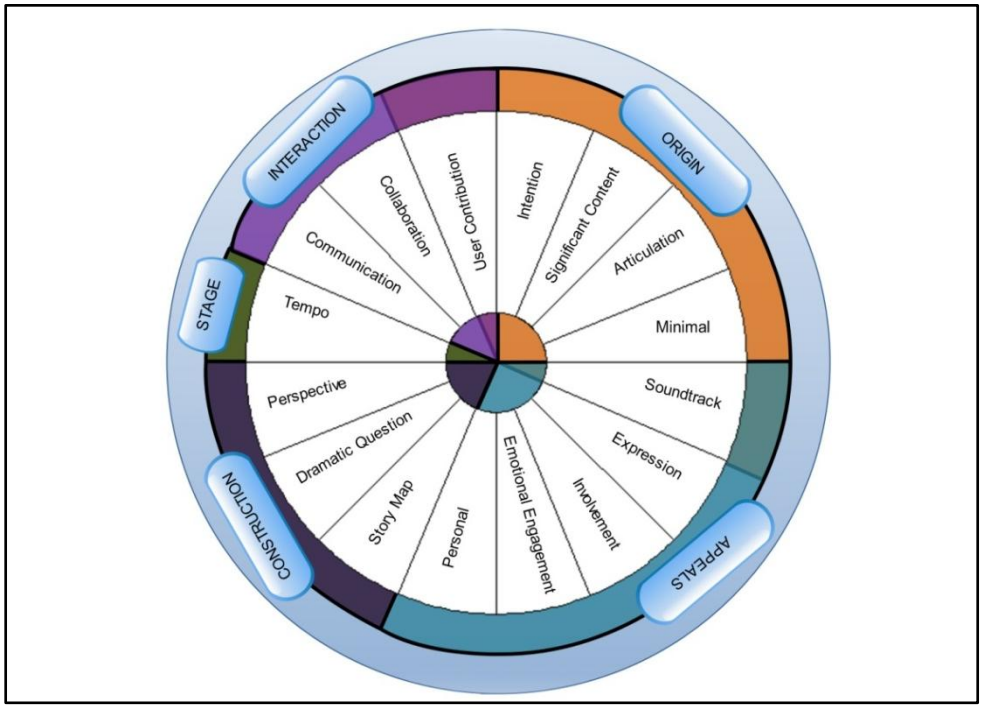


Figure 3.2: Initial Conceptual Model of DST Core Elements

3.4 Iteration

The third phase succeeding Induction phase is Iteration. This phase consists of a single sub phase which is called mental experiment. The main activity of mental experiment is to refine the initial conceptual model constructed during Induction phase. The refinement routine is performed from the perspective of the researcher. It was done by referring back to the findings of the literature study conducted in Groundwork phase coupled with assumptions in handling the data from the case analyzed in Induction Phase.

In addition, literature study was updated as well in case there were any significant changes to the elements selected as one of the cases. Any major changes in the elements selected would affect the cases analyzed hence, affecting the initial

conceptual model constructed. The researcher also reanalyzed the cases and the data derived from it repeatedly to ensure that the core elements obtained from the commonality came from a correct evaluation and assumption.

The connections and links between the core elements were also evaluated. There were three iterations of the conceptual model proposed. The following Figure 3.3 shows the first iteration of the conceptual model.

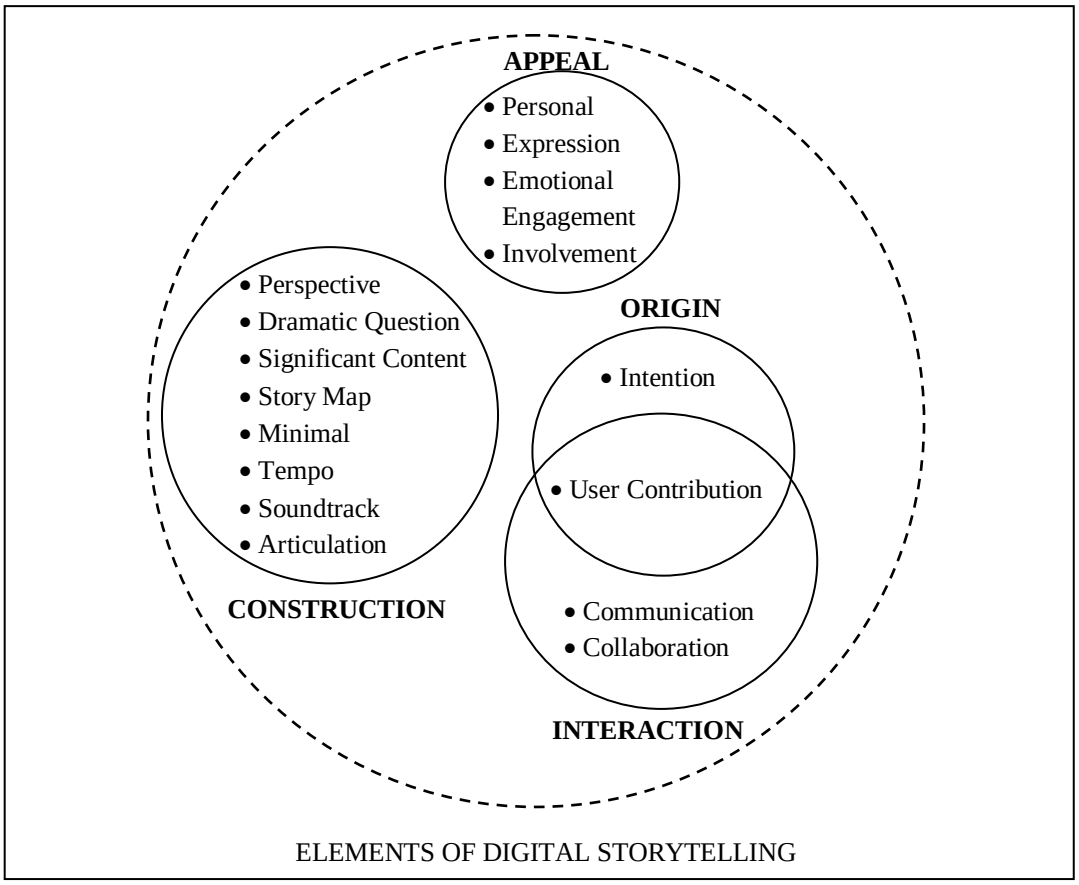


Figure 3.3: First Iteration of the Conceptual Model

As the first iteration was completed, more mental experiment was done and depicted in Figure 3.4, the second iteration of the conceptual model.

Finally, once the mental experiment has reached its stop point, the third and the last iteration of the conceptual model was formed and its elaboration regarding the conceptual model itself and its components (core elements, clusters, and categories) can also be found in Chapter 4.

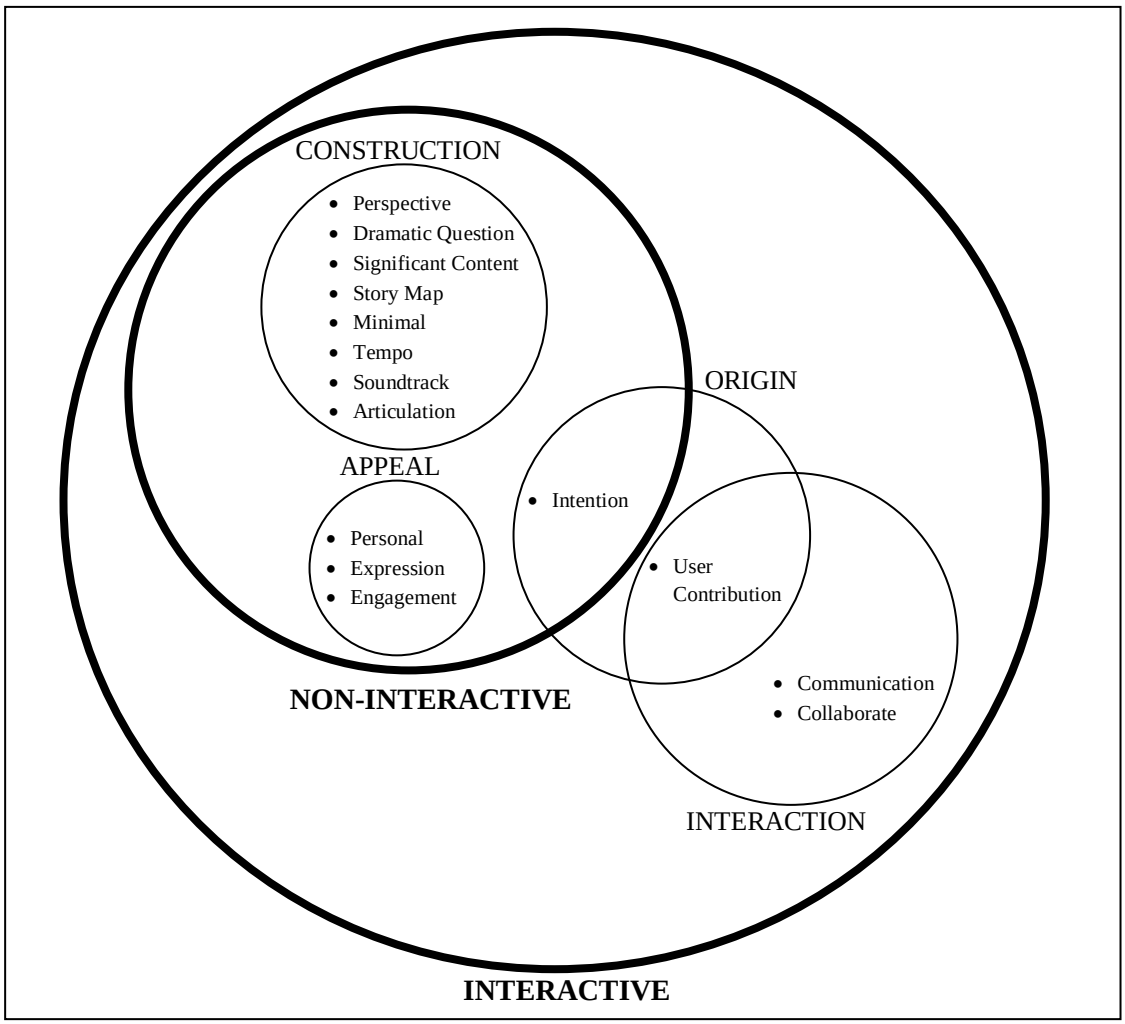


Figure 3.4: Second Iteration of the Conceptual Model

The mental experiment phase was considered as completed for the moment as the final drafted version of the initial conceptual model was completed and accepted. Once the initial conceptual model was refined, the last phase took place, which is Conclusion.

3.5 Conclusion

Conclusion is the final phase for this study. It consists of four sub phases which are Expert Review evaluation, Reaching Closure, Conceptual Model Quality Evaluation and Future Works Suggestion.

3.5.1 Expert Review

The first sub phase which is expert review was conducted in order to get feedback of the experts of DST in terms of the conceptual model being proposed, in directly getting their feedback on the core elements. In the expert review process, a cover letter was sent up to the experts in DST fields via email as an invitation to participate in reviewing the DST core element. These experts were kindly requested to deliver their feedback and opinion on the conceptual model proposed based on the core elements, clusters and categories they belonged to. The core elements and its description were separated into two categories which are non interactive and interactive DST and organized into tables. The experts' feedbacks were then measured using a Likert Scale questionnaire with three levels of responding, Disagree, Uncertain, and Agree. Appendix C shows the non interactive DST and the interactive DST heuristics.

3.5.2 Reaching Closure

Based on the feedback provided using the Likert scale, the experts' feedbacks were measured to acquire their review on the core elements proposed. The review was deemed as agree, or disagree. In the case of the value of agreement is high (3 or more experts are agreed), the core element proposed remains unchanged.

Nevertheless, if the opposite case, the researchers have determined not to use the elements as part of the proposed core unless the researcher deems the core elements as necessary as justified and supported by theories. Once an element is removed, the conceptual model needed to be altered which means the process is reversed to the previous phase, which is, Iteration. This was done in order to mend the conceptual model proposed to match the review of the experts. Once the mending process was completed, the conceptual model proposed is considered as completed and reached the closure of the conclusion phase since the conceptual model proposed has arrived at its saturated point where the analysis and integration of elements based on a mental experiment of the researcher and the experts' reviews have moulded it into the final form. The detailed discussions on the experts' review and the final form of the conceptual model are presented in Chapter 5.

3.5.3 Conceptual Model Quality Evaluation

The final form of DST conceptual model is the outcome of researcher's mental experiment and expert reviews. The following phase is to have the potential users evaluate the quality of the conceptual model. Moody (2005), Maes and Poels (2007) agree that the quality of the final product is highly dependent on quality of conceptual model. The evaluation is based on four constructs from user's point of view in order to evaluate the quality of conceptual model. The constructs are: Perceived ease of understanding (PEOU), Perceived usefulness (PU), User satisfaction (US), and Perceived semantic quality (PSQ). The conceptual model quality evaluation was conducted to gain the users' view point regarding the

proposed DST core elements conceptual model. Therefore, a questionnaire adapted from Maes and Poels (2006) was used in this phase.

Meanwhile, the sampling method used in choosing the sample subjects in this study is Convenience Sampling. Convenience Sampling is a method of "collecting information from members of population who are conveniently available to provide it" (Cavana, Delahaye, & Sekaran, 2001, p. 262). As for this study, the samples/population was the undergraduates of Bachelor Degree in Multimedia at Universiti Utara Malaysia. They were the nearest and most convenient group of respondents available while the study was ongoing.

The evaluation was conducted with a group of multimedia students in Universiti Utara Malaysia, who were targeted as potential users, which furthermore were divided into two distinguish groups which are experienced and non-experienced users. There were 62 respondents involved in this evaluation study and according to Roscoe (1975), sample sizes range between 30 to 500 are suitable for most research (as cited in Cavana, et al., 2001). The survey session was conducted in the participant lecture hall. They were informed of the purpose of the survey. At the beginning of the session, they were briefly explained about DST and the core elements and as soon as the explanation ended, they were required to complete the questionnaire provided and submitted at the end. Then, the completed questionnaire was being collected and analysed. The results of the finding are discussed in Chapter 6.

3.5.4 Future Research Direction Suggestion

Once the conceptual model of the core elements of DST has been completed in the compound of the study, it cannot be denied that there are weaknesses and enhancement that can be made in the future by the researcher or others. Therefore, the future works and directions were also discussed to give room for the study to grow and evolve for the betterment of it. Further discussion of this particular issue resides in Chapter 7.

3.6 Pre-Testing

Pre-testing is a step in evaluating a newly constructed or adapted instrument (Cavana, et al., 2001; Robson, 2011). The pre-testing help the researcher determine the difficulty in answering the items provided and to detect if there is any ambiguity or biased question (Zikmund, 2003). There are a few methods to conduct a pre-test of a questionnaire such as: expert review, questionnaire appraisal coding systems, interviewer debriefings and cognitive interviewing (DeMaio, Rothgeb, & Hess, 1998; Rothgeb, Willis, & Forsyth, 2007). In this study, however, the questionnaire has been evaluated via expert review method. The questionnaire was delegated to a group of experts for perusal and comments on the suitability of the wordings used in the questionnaire on the matter.

3.6.1 Pre-Test for Expert Review Questionnaire

As for the expert review of the DST core elements, a simple questionnaire was designed to obtain the experts' feedback regarding the core elements and the conceptual model. In order to validate the items of the questionnaire, the

questionnaire was distributed to 10 experienced researchers. The inputs provided by them were utilized to enhance the clarity of the questionnaire and correctness of the items given.

3.6.2 Pre-Test for User Evaluation Questionnaire

The questionnaire to measure the quality of the conceptual model from users' perception was adapted from the constructs created by Maes and Poels (2007) that achieves the same aim which is to evaluate the quality of conceptual model. In order to validate the adapted constructs, 3 experts were involved in this process. They are experienced individuals in research academic areas and also multimedia lecturers. A set of questionnaire with comments column was distributed to the experts. These experts were kindly requested to deliver their feedback and opinion regarding the suitability of the wording used in the questionnaire in a separated meeting. The feedbacks received from the experts were utilized in the betterment of the adapted questionnaire in measuring the quality of the conceptual model proposed. The outcome of the pre-test is further discussed in following subchapter.

3.6.2.1 Questionnaire Pre-Testing Outcome

A questionnaire to measure the quality of the conceptual model was adapted from Maes and Poels (2006). Aforementioned in Chapter 3, items in this phase were pre-tested by 3 experts. Feedbacks received from them were utilized in the betterment of the questionnaire. The altered questionnaire items are as presented in Table 3.1. As can be noticed, the sentence of the items are modified further, where new items for

PEOU are reduced to 3, US are reduced to 3, PU are reduced to 2, and PSQ are reduced to 3. These are slightly different from items proposed in Table 2.12.

Table 3.1: Outcome of Questionnaire Pre-Testing

CONSTRUCT	ITEM	CONSTRUCT	ITEM
$PEOU_1$	It was easy for me to understand the conceptual model	**PU_1**	I found the conceptual model useful for understanding the DST
$PEOU_2$	The conceptual model was easy to use	**PU_2**	I think the conceptual model improves my performance in completing the task given.
$PEOU_3$	I can easily interpret the conceptual model		
US_1	The information provided in the conceptual model was adequate	**PSQ_1**	The conceptual model correctly represents the DST
US_2	The conceptual model was effective in providing the information	**PSQ_2**	All the elements in the conceptual model are relevant for DST
US_3	Overall, I was satisfied with the conceptual model for providing the needed information	**PSQ_3**	Overall, the conceptual model gives a complete representation of the DST
Legend			
PEOU	Perceived ease of understanding	**PU**	Perceived usefulness
US	User satisfaction	**PSQ**	Perceived semantic quality

The altered questionnaire is then use in a pilot test for testing it reliability. The process is further discussed in the following subchapter.

3.6.2.2 Pilot Test

A pilot test is conducted to run the reliability tests on the questionnaires to evaluate the conceptual in order to enhance the accuracy of evaluations. "Validity and reliability are two fundamental elements in the evaluation of a measurement instrument (Tavakol & Dennick, 2011)." Validity of the instrument was achieved through face validity in the pre-testing process; where the experts agreed that the instrument is logically reflects the concept being measured (Zikmund, 2003).

Reliability is about consistency in the results of the measurement (Brinkman, 2009). The pilot test was conducted with a group of 30 students to assess the reliability of the user evaluation questionnaire by measuring Cronbach's alpha value. The result of the reliability analysis is shown in Table 3.2.

Table 3.2: Reliability Analysis on PEOU, PU, PSQ, and US

Constructs	N	Cronbach's Alpha	Number of Items
PEOU	30	.816	3
PU	30	.724	2
PSQ	30	.812	3
US	30	.780	3

The Alpha value for each construct (PEOU, PU, PSQ, and US) is more than 0.7. "The closer the Cronbach's alpha coefficient is to 1 the greater the internal consistency of the items in the scale (Gliem & Gliem, 2003)". According to George and Mallery (2003) rules of thumb the construct with Cronbach's Alpha coefficient > 0.7 is acceptable. The finalized questionnaire is as attached in Appendix D. This was used to collect data from 62 respondents.

3.7 Summary

This chapter discusses and elaborates the methodology applied in conducting the study from the beginning to the end. Iterative Triangulation Methodology was adapted in order to guide the focus of the study. There were four phases which are Groundwork, Induction, Iteration and Conclusion. Each of the phases has been elucidated at best to explain the process of the study from start to end. The explanation regarding unit of analysis and pre test conducted were also included. Next chapter will focus on discussing the conceptual model proposed in details.

CHAPTER FOUR
CONCEPTUAL MODEL CONSTRUCTION

4.1 Chapter Overview

This chapter explains about the conceptual model constructed in details. All the elements identified as core and abstract layers they belong to are elaborated along with the definition for each of the elements. As an addition, the comparison of existing sets of elements from various experts is also explained in order to demonstrate the commonalities sought. The theories used to support the elements are elucidated in this chapter.

4.2 Conceptual model of DST Core Elements

Digital storytelling construction is a creative process. Different digital storyteller tells a story differently depending on the elements he applied in the digital story. Since the birth of digital storytelling by Atchley and Lambert, apart from the seven elements of digital storytelling by Lambert, there are individuals that showed their interest in the subject matter and started introducing their own sets of elements. These elements are supposed to guide the digital storyteller in the process of constructing good digital storytelling. However, with so many sets of elements existed, it is an intricate decision to decide which set of elements is to be used and seeing from the perspective of this study's context which is educational, it can be rather confusing to students aspiring to construct a digital storytelling. This matter is made more complicated by another school of thought which is an interactive digital storytelling as opposed to the traditional form. This raised questions whether all the

elements by the experts can be used for both forms and which is best represent both. Having said that, it is pertinent that this study is conducted to seek the proper elements that can represent both types of digital storytelling and act as a single reference point for digital storytellers to come to whenever they need a source of reference to construct a digital storytelling. Nevertheless, it is not the aim of the study to provide a guide to construct a good digital storytelling but a guide merely since the good and bad of a digital storytelling is hard to be judged and falls upon individual's own perception (Ohler, 2008). The 15 core elements identified have been represented in a conceptual model in order to visualize it clearly. These core elements comprise of 12 elements of non interactive DST and 15 core elements of interactive DST. Some of the core elements from both categories do cross and can be applied in both. Therefore, these elements were integrated and 15 core elements emerged. The conceptual model proposed representing the 15 core elements is as shown in the following Figure 4.1 and Table 4.1.

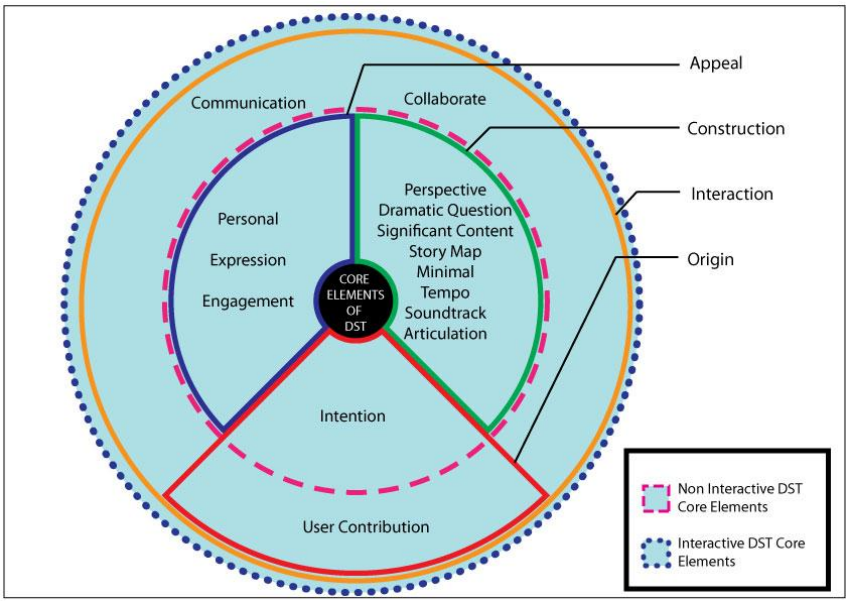


Figure 4.1: Preliminary Model of Core Elements of Digital Storytelling

Table 4.1: Categories of digital storytelling

NON -INTERACTIVE DIGITAL STORYTELLING ELEMENTS		INTERACTIVE DIGITAL STORYTELLING ELEMENTS	
Group	**Core Elements**	**Group**	**Core Elements**
1	Perspective	1	Perspective
2	Intention	2	Intention
3	Personal	3	Personal
4	Dramatical Question	4	Dramatical Question
5	Engagement	5	Engagement
6	Articulation	6	Articulation
7	Soundtrack	7	Soundtrack
8	Minimal	8	Minimal
9	Tempo	9	Tempo
10	Story Map	10	Story Map
11	Expression	11	Expression
12	Significant Content	12	Significant Content
		13	Collaboration
		14	Communication
		15	User Contribution

Generally, interactive digital storytelling is defined by the study as non-linear and has components of interactivity between the viewers and the digital story itself. Meanwhile non-interactive digital storytelling is the traditional linear video form of digital storytelling as pioneered by Atchley and Lambert. The next level of the division of the elements is four different clusters which were adapted from Schafer's abstract layers (Schafer, 2008) and some of them crossed-clusters showing that the particular element belongs to both clusters.

4.2.1 Clusters in Conceptual Model

Referring to Abstract layer model by Schafer (2008) in Figure 2.2 originally there were five clusters which are Origin, Construction, Stage, Interaction, and Appeal. Each of the clusters contains its own elements. This study used the clusters to show the different purpose and use of elements as guidance in digital storytelling construction. Nevertheless, since the study identified the core elements based on commonalities with other experts' elements discerned via literature study conducted, Stage has been omitted since no commonalties could be found among its elements and other experts' elements. This explains the four clusters in the conceptual model instead of the five original abstract layers suggested by Schafer (2008). The first cluster is Origin which are elements that have to do with the genesis of the digital story substance. Next cluster is Construction that deals with the development of the digital story's design and consistency. The third cluster is Interaction. This layer mainly deals with elements of interactive digital storytelling that permits the viewers to influence the consequence of the digital story and also construct their own storyline based on their interaction with the digital storytelling. The last cluster is Appeal. It grouped the elements that are supposed to affect the experience of viewers watching the digital storytelling from different aspects. Under these clusters, the core elements identified are allocated respectively as shown in Table 4.2.

Table 4.2: Division of Cores Element to Cluster

Cluster	Core Elements
Origin	Intention
	User contribution
Construction	Perspective
	Dramatic Question
	Significant Content
	Minimal
	Tempo
	Story Map
	Soundtrack
	Articulation
Interaction	Communication
	Collaborate
Appeal	Personal
	Expression
	Engagement

4.2.2 Core Elements in Conceptual Model

The core elements were identified from the sets of elements of seven selected digital storytelling researchers (such as: Lambert, Porter, Salpeter, Robin, Ohler, Schafer and Paul & Fiebich). The commonalities of the elements were analyzed in order to find the core elements of digital storytelling. The elements that do not have any commonalities with any elements were isolated and not considered as core elements. The result of the analysis is as displayed in Appendix A.

Based on the Table 4.1, as aforementioned, there are fifteen elements of digital storytelling identified as the result of the comparisons of seven DST models. The

first core element is generated from the elements of point of view by Lambert and Ohler and the narrator's point of view by Robin. These three elements have similarity in that they suggest the construction of DST must be about trying to get across certain point from the perspective of the digital storyteller be it in first or third perspective view.

Unfolding lesson learned, the overall purpose of the story, and user contribution by Porter, Robin, and Schafer formed the result of the second comparison. The first two elements by Porter and Robin clearly state that a digital storytelling must have a purpose in the beginning contributed by the digital storyteller and it maintains throughout the content of the story and be revealed in the end, hence they were grouped together. As for Schafer's her element is inclined towards interactive DST but in her elaboration regarding the element, she stated that the element actually measures the extent to which a digital storyteller contributes to the content of the DST. By contributing to the content of the digital story, it helps to establish a focus on the purpose of the digital story constructed and therefore it has been grouped with the other two elements.

The third core element came from the common interpretation of living in your story and personal by Porter and Salpeter. Both elements have a strong sameness in terms that they suggested that a digital storytelling is narrated personally about the digital storyteller and showing that the story told has impact and affected in his life one way or another. The elements strongly suggest the use of the digital storyteller's own voice to narrate.

Lambert and Robin both introduced element of dramatic question while Porter suggested developing creative tension which the analysis shows that there is a common ground in these three elements. These three elements give strong reason to be grouped together since they all revolve around creating a question that fabricates a tension in the digital story which will hold the audiences' attention from beginning to the end of the DST.

The fifth core element identified is the result of comparison of three experts which are Lambert, Ohler, and Schafer. The elements compared are emotional content, emotional engagement, and immersion respectively. Lambert and Ohler talk about the use of emotion in the digital story in order to engage and drawn audiences more into the digital story. Even though Ohler did raise a question whether emotion is truly needed in all types of DST, he still does not deny the emotional engagement in DST. As or Schafer, she states that immersion is about the degree of the audiences engulfed by the digital story to the level that the story's spatial becomes real to the user. This is similar to what Lambert's and Ohler's elements try to achieve which is to engage and draw audiences into the digital story.

The gift of voice by Lambert and spoken narrative by Ohler constituted the outcome of sixth comparison. There is no doubt that these two elements configure the same suggestion in DST construction which is the use of voice in narrating the story would leave more impact on the digital story especially the voice of the digital storyteller himself.

The seventh comparison resulted from the common attributes of power of soundtrack, use of meaningful audio soundtrack, and soundtrack music each by Lambert, Robin, and Ohler respectively. All of the elements suggest a prudent and cautious use of music as a supportive element in a digital story since music is capable of moving audiences' emotion but not to the level of the music takes over the role of the story.

Next comparison displays the shared of similar definition of elements by Lambert, Porter, Salpeter, Robin, and Ohler. Their elements are namely economy, economizing the story told, concise and use readily available material, economy of the story detail, time, story length and economy, and role of video and performance. Basically these elements advise that a DST should not be too long for it will help curve the content of the digital story with the important ones and discard the unnecessary information.

The ninth commonality was found in pacing, pacing of the narrative, and tone by Lambert, Robin, and Ohler. Generally, these elements speak about the rhythm and beat of the digital story can have implications on the audiences' interest and attention sustainment in the digital story. It can affect the way the digital story influences the audiences' state of emotion and assists in delivering the intentioned storyline.

The next similarity was discovered in Salpeter's and Schafer's elements of universal story element and structure. It is about the application of universal story structure and elements in digital storytelling construction. This means that a DST should have

the traditional arc of a story which is beginning, middle, and closure and the elements such as tension, resolution, conflict, and growth.

Porter's and Robin's elements are the eleventh comparison made in an effort to seek the core elements. Showing not telling, choice of content and quality of the image and video elements showed similarity in what they suggesting in a DST construction. Fundamentally these elements are about conveying messages and information in certain scenes of DST without the use narrative. Instead, symbolism and metaphor that heed interpretation from the audiences are used.

Economy element by Lambert once again been grouped with the other expert's element which is Porter's developing craftsmanship. This is due to Lambert's explanation of the economy element in his book Digital Storytelling: capturing lives creating community that caters two sided of coins. The commonality found deems that both elements talk about the limitation of use of multimedia elements in DST construction. DST should focus on the story in the first place and the multimedia elements are used to help to amplify the essence and substance of the story. The elements should never be used as decoration in DST.

Constituting the thirteenth commonality is the result of the comparison analysis between three elements of collaboration by Salpeter and also Schafer and communication by Paul and Fiebich. The underlying definition of these elements is about the experience and creation of DST by interacting with other people inclusive digital storytellers and the audiences. It is obvious that these elements tilted toward interactive DST.

The second last comparison in order to achieve commonality of DST elements is resulted from element of control and interactivity by Schafer and action by Paul and Fiebich. These elements primary similarity is that they discuss about permitting the audiences of the DST to tweak alter or influence the digital story. This act is unnecessarily will change the flow or meaning of the story but gives the option to the audiences to actively engage in the story development. Again, these elements are clearly favouring the interactive DST.

The final comparison is performed on two elements by Schafer, and Paul and Fiebich to find commonality in forming a core element for interactive DST. Those elements are user contribution and relationship. Rudimentarily, these elements promote that the audiences contribute to the creation of the digital storytelling content. This means the audiences interact with the digital story by providing information or materials that will shape the digital storytelling in entirety.

Unfortunately, there are elements that the study did not find any commonality after they were compared. Those elements are the story/script by Salpeter, good grammar and language use and clarity of voice by Robin, creativity and originality by Ohler, continuity, concreteness, coherence, cognitive effort, virtuality, and spatiality by Schafer and lastly media and context by Paul and Fiebich. Annulled the discarded elements, the fifteen comparison analysis resulted in fifteen core elements as depicted in the conceptual model and they are discussed in Table 4.3 in details including the core elements themselves, their given explanation based on the summarization of the commonalities found between the elements, the experts and

their elements that formed the core elements, and also the sheltering abstract layers as discussed previously.

Table 4.3: Core Elements of Digital Storytelling Clustering

		Core Element	Cluster
1	Element Name	**INTENTION**	**Origin**
	Explanation	Stories are trying to accomplish and achieve a particular task (inform, educate, entertain, scare, etc.)	
	Experts	**The overall purpose of the story** *(Robin),* **Unfolding lesson learned** *(Porter)*	
2	Element Name	**SIGNIFICANT CONTENT**	**Construction**
	Explanation	Materials used to develop story contribute to the plot of the story.	
	Experts	**Developing craftsmanship** *(Porter),* **Economy** *(Lambert)*	
3	Element Name	**ARTICULATION**	**Construction**
	Explanation	The usage of voice to tell the story in order for a better impact in delivering a message.	
	Experts	**The Gift of your Voice** *(Lambert),* **Spoken narrative** *(Ohler)*	
4	Element Name	**MINIMAL**	**Construction**
	Explanation	Uses adequate and sufficient material to produce a story without exaggerating.	
	Experts	**Economy** *(Lambert, Nichols),* **Economy of the story detail** *(Robin),* **Economizing the story told** *(Porter),* **Are concise, Use readily available source materials** *(Salpeter),* **Time, story length and economy**, **Role of video and performance** *(Ohler)*	
5	Element Name	**SOUNDTRACK**	**Construction**
	Explanation	Soundtrack is used to support the emotional value and message the story tries to deliver and to attract audience's interest.	
	Experts	**Power of Soundtrack** *(Lambert),* **Use of meaningful audio soundtrack** *(Robin),* **Soundtrack music** *(Ohler)*	
6	Element Name	**PERSPECTIVE**	**Construction**
	Explanation	The point can be in the perceptive of first person or third person.	
	Experts	**Point of View** (*Lambert, Ohler),* **The narrator's point of view** *(Robin),*	
7	Element Name	**DRAMATICAL QUESTION**	**Construction**
	Explanation	A question or situation is use in the progress of the story to engage the viewer and resolved at the end.	
	Experts	**A Dramatic Question** *(Lambert, Robin),* **Developing creative tension** *(Porter)*	

8	Element Name	**STORY MAP**	**Construction**
	Explanation	Story has the dramatic arc of introduction, body and conclusion.	
	Experts	**Including universal story elements** *(Salpeter)*, (Conceptual) **Structure** *(Schafer)*	
9	Element Name	TEMPO	Construction
	Explanation	Pace of story changed by the music tempo, speech rate, image duration, panning and zooming speed to make story interesting.	
	Experts	Pacing (Lambert), Pacing of the narrative (Robin), Tone (Ohler)	
10	Element Name	PERSONAL	Appeals
	Explanation	Narrator personalizes the story, told how it affects him/her in life in order to engage the viewers.	
	Experts	Living in your story (Porter), Are personal (Salpeter)	
11	Element Name	ENGAGEMENT	Appeals
	Explanation	The story ability to draw audience's attention by emotion or content(objective)	
	Experts	Emotional Content (Lambert), Emotional engagement (Ohler) , Immersion (Schafer)	
12	Element Name	EXPRESSION	Appeals
	Explanation	Usage of media content such as image and sound to deliver message indirectly rather than using words.	
	Experts	Choice of content, Quality of the image, video (Robin), Showing not telling (Porter)	
13	Element Name	COLLABORATION	Interaction
	Explanation	User interacts with other user in order to produce a story.	
	Experts	Involve collaboration (Salpeter), Collaboration (Schafer), Communication (Paul)	
14	Element Name	USER CONTRIBUTION	Interaction/ Origin
	Explanation	User contributes to the creation of the story content by interacting to system.	
	Experts	(Open) Relationship (Paul), User contribution (Schafer)	
15	Element Name	COMMUNICATION	Interaction
	Explanation	User able to interact to the story. The interaction might cause changes to the story and it might be not.	
	Experts	Control, Interactivity (Schafer), (User) Action (Paul)	

4.3 Theories supporting core elements

As elaborated in Chapter 2, the core elements proposed were supported by theories and models to justify the need of the elements in story-related development. Among

the theories and model considered are Cognitive Theory of Multimedia Learning, Minimalism, Aristotle's Theory of Drama, Neo-Aristotelian Theory of Interactive Drama, and Storylistening Trance Experience Model. Each of the theories and models supports more than one core element since the principles discovered in the theory and model are capable to justify some of the core elements. Some of the theories and models co-support the core elements because the principles laid by them happenstance to justify the same core elements. Thus, it makes the justification much sturdier and credible. The details of the supporting theory and model for the core elements are as shown in Table 4.3. The table also explicates the principles in the theories and models that were used to support the core elements.

Table 4.4: Supporting Theories and Model of Core Elements

No	Core Element	Theory	Principle	Description
1.	Intention	A Neo-Aristotelian Theory	Formal cause	Story's formal cause is the goal the storyteller or author wants to unfold in a story.
2.	User contribution		User intention	In interactive DST, a user is able to control the character. User's action (made by user's intention) is a formal cause of the story.
3.	Communication		User intention (action)	User ability to interact in the story made the user's actions contribute to the story development. However it is sometimes limited by material source and story plot.
4.	Collaboration		User intention (action)	User is able to influence other character by helping or against them in their goal and plan.

5.	Dramatical Question	"Storylistening" Trance Experience	Story content	"Listener felt that the important elements of story are the kind of story, the subject of the story, the theme of the story and the emotional tenor of the story (Sturm, 2000)."
6.	Perspective	A Neo-Aristotelian Theory	Pattern	Story can be conveyed in first person perspective (in interactive story) and also third person perspective (in performance).
7.	Articulation	Cognitive Theory of Multimedia Learning (CTML)	Voice Principle	People learn better when words are spoken in a human voice than in a machine voice or foreign-accented human voice.
			Modality Principle	Human learn better from animation and narration than from animation and on-screen text.
8.	Soundtrack	A Neo-Aristotelian Theory	Medium	Story is conveyed through a variety of different media (such as spoken words, music and image) to the audience.
9.	Minimal	CTML	Coherence Principle	People learn better when extraneous words, pictures, and sounds are excluded rather than included.
		Minimalism	Minimalism	"The critical idea of minimalist theory is to minimize the extent to which instructional materials obstruct learning and focus the design on activities that support learner-directed activity and accomplishment. (Culatta, 2012)"
10.	Tempo	"Storylistening" Trance Experience	Rhythm	Rhythm is an important component to enter trance.
11.	Story Map	Aristotle's Theory	Dramatic structure	Good story has the dramatic structure that invokes emotional purging and relief of audience.

12.	Significant Content	CTML	Coherence Principle	People learn better when extraneous words, pictures, and sounds are excluded rather than included.
13.	Personal	CTML	Personalization Principle	People learn better when words are in conversational style rather than formal style.
		"Storylistening" Trance Experience	Storyteller involvement	"Storyteller who is involved in their stories seemed able to convey the importance of the stories more effectively (Sturm, 2000)."
14.	Engagement	"Storylistening" Trance Experience	Story content	"Listener felt that the important elements of story are the kind of story, the subject of the story, the theme of the story and the emotional tenor of the story (Sturm, 2000)."
15.	Expression	CTML	Multimedia Principle	People learn better from words and pictures than from words alone.

4.4 Summary

This chapter discusses the core elements of digital storytelling for the proposed conceptual model. The conceptual model is the result of a comparative analysis conducted on DST elements introduced by seven researchers. The analysis seeks for the commonalities of the elements and grouped them to fabricate new standardize core elements of DST representing interactive and non interactive DST. Each of the elements was explained along with the cluster sheltering them. The next chapter will discuss the results of the expert review conducted on the conceptual model proposed.

CHAPTER FIVE
EXPERT REVIEW AND USER EVALUATION RESULTS

5.1 Chapter Overview

This chapter is dedicated to discuss and elaborate the result of the expert reviews and users evaluation conducted on the conceptual model of DST core elements. A review was conducted with the experts in order get the opinion and feedback regarding the core elements identified and proposed as DST. Five experts with more than five years experience on DST at hands had reviewed the conceptual model. Further, an evaluation of conceptual model quality based on users' perception was conducted. The detail of both evaluation process and finding are explained in this chapter.

5.2 Expert Review Process

The preliminary conceptual model basically gathers 15 pivotal elements of DST identified based on the commonalities of DST elements introduced by DST researchers as discussed in Chapter 4. These pivotal elements, inclusive of non interactive and interactive DST, are deemed as core elements which become the guide in the development of a DST. As an effort to acquire feedback and fruit of thoughts regarding the core elements discerned from the study, review by the experts of DST is necessary to be procured. Five experts participated in the review process. Details of their profile are depicted in Table 5.1. Each expert was provided with the preliminary model of core element of DST and a set of questionnaire (refer to Appendix C) designed to obtain their feedback on each of the core elements

represented by the conceptual model. The questionnaire was segmented into two parts typifying the non interactive and interactive core elements of DST.

Table 5.1: Experts Profile

Experts	Name	Experiences in DST	Occupation	Organisation
A	Bernard Robin	> 5 years	Professor	University of Houston
B	Kay Teehan	> 5 years	Technology Specialist	Polk County Schools
C	Daniel Meadows	> 5 years	University Lecturer	Cardiff School of Journalism, Media and Cultural Studies
D	Mark Standley	> 5 years	Chief Education Officer	Educating 4 Leadership
E	Carolyn Handler Miler	> 5 years	Writer, Lecturer, Consultant	University of New Mexico

In the expert review process, a cover letter was sent to the DST experts via email as an invitation to participate in reviewing the core element. The email provided the link to an online questionnaire allowing them to respond according to the level of agreements on inclusion of the core elements in the conceptual model. Any uncertainty and explanations are done through email conversations. Snapshots of the cover letter, online questionnaire and email conversation are as provided in Appendix C.

The outcomes of the review by the experts on both types of DST core elements are elaborated more in the next section starting with the non interactive DST core elements.

5.2.1 Expert Review on non interactive DST core elements

There are 12 core elements of non interactive DST that have been identified in the study. These 12 core elements were described to the five experts as in Appendix C. Based on the descriptions of each core element provided; the experts had reviewed the conceptual model.

The results of the expert review are depicted in bar chart in order to visualise the frequency of experts' response over each of the core elements. The values on Y-axis represent the level of agreements indicated as follows: 1 = Disagree, 2 = Uncertain, 3 = Agree. The core elements with 3 or more Agree are considered as accepted by the experts as the core elements of non interactive DST. For the opposite case, the researchers' judgment based on an extensive literature study conducted would be required to determine whether the particular core element is to be accepted or not. The chart for the experts' response of non interactive DST is depicted in the Figure 5.1 entailed by the descriptions of each of the responses.

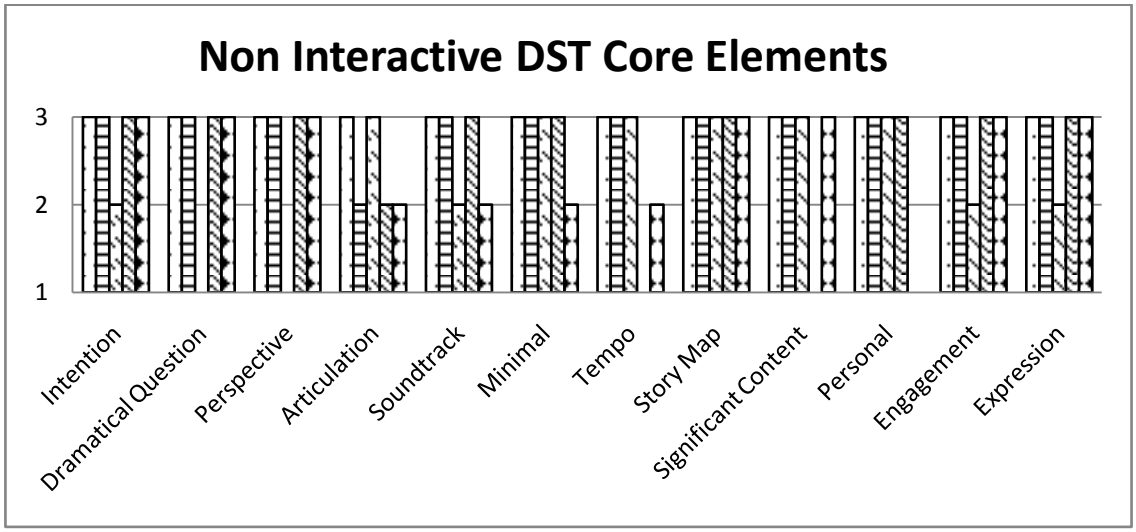


Figure 5.1: Result for Non Interactive DST Core Elements

There are 12 core elements proposed under the category of non interactive DST. Judging from the pattern of the chart plotted in Figure 5.1, it can be synthesized that the experts agreed on 11 of the proposed core elements. Those core elements are Intention, Dramatical Question, Soundtrack, Storymap, Significant Content, Personal, Engagement, Expression, Perspective, Minimal and Tempo. These core elements are agreed by more than three ($3 \leq$) experts and evidently they are accepted by the experts as core elements of non interactive DST.

However, the experts' review on core element Articulation is debatable since only two experts agreed and the others three are uncertain. The equivocal state of the sanalysis called for the researchers' intervention to determine the circumstance of core element Articulation as the core element. In the circle of the study conducted, Articulation is defined as the use of voice to narrate a story in order to leave a better impact in message deliverance. Rewinding time to the pivotal moments where technology was none to be found to support storytelling; voice, among others was

the prominent channel to narrate stories. It is fitting that voice is not always necessary to narrate a story. Porter (2004) and Schafer (2008), for instance, never mentioned about the use of voice in their set of elements. Nevertheless, it cannot be denied that the inclusion of voice in DST development would assist in augmenting the value of the DST. Ohler (2008) states that voice in DST is not a necessity but it always exist in DST. As for Lambert (2006), he clearly showed the gravitation of voice in DST by stressing that voice is a gift and every digital storyteller is urged to use their own voice in developing a DST. Voice, according to L. C. Miller (2010) in her experience working with students, is one of the elements that are particular to digital stories. Though she palpably stated that not all DST must include voice, it is also made clear by Miller that voice imparts power in the DST along with soundtrack and arts that propel the content of the DST. To reinforce the fact that voice is pivotal in DST, Hamill (2010) wrote in her book entitled *Your Family Your Story: A guide to Digital Storytelling*, it is crucial that in documenting personal stories using DST, voices are recorded. This is because voice allows younger generations to not only to see the mannerism of previous generations but also to hear them. On top of that, Tyner (1998) emphasized that the main objective of the practice of digital storytelling in school is to personify the voice of students who otherwise remain silent in their schools and communities (as cited in Banaszewski, 2005). Voice allows the students to express and represent their experiences and communities via DST accurately; than the use of images alone that sometimes pave paths to multiple interpretations. All the explanation regarding the importance of voice in DST development demonstrates that element of voice, or Articulation in the study context is necessary in DST development. Voice empowers the meaning that a digital story

imparts and by many folds amplifies the power of other media such as image and animation. Based on the justifications rendered, thus the core element Articulation is accepted.

Judging from chart distribution in Figure 5.1, it is obvious that the result of the expert review of non interactive DST core elements is very positive with the exception of Articulation core element that requires justification since it is deemed as pivotal in non interactive DST development. This shows that the experts of DST agreed that the core elements proposed in the study are to be considered as guidance in developing a non interactive DST. Next section discusses about the result of expert review conducted on the interactive DST core elements.

5.2.2 Expert Review on interactive DST core elements

There are 15 core elements of interactive DST that have been identified in the study. These 15 core elements were described to the five experts through emails.

Based on the descriptions of each core element, the experts had reviewed the conceptual model. There are three core elements (User Contribution, Collaborate, and Communication) in the conceptual model that are exclusive to the interactive DST. The rest of the core elements are the same as the non interactive DST. This is due to the fact that story plays a vital role in DST and based on literature study, interactive DST still requires the elements of non interactive DST (C. H. Miller, 2008). The interactivity elements included differentiate it from the non interactive DST significantly. However, even though there are same core elements applied in the case of interactive DST, their application slightly differs. This is based on the

fact that the expert review conducted by the same experts on the same core elements from these two categories yielded a slightly different pattern.

Similar to non interactive DST core elements, the results of expert review for the interactive DST core element are also depicted in a bar chart. The values on Y-axis again represent the level of agreements and the core elements with 3 or more Agree are considered as accepted by the experts as the core elements of interactive DST. The chart for the experts' response of interactive DST is depicted in the Figure 5.2 entailed by the descriptions of each of the responses.

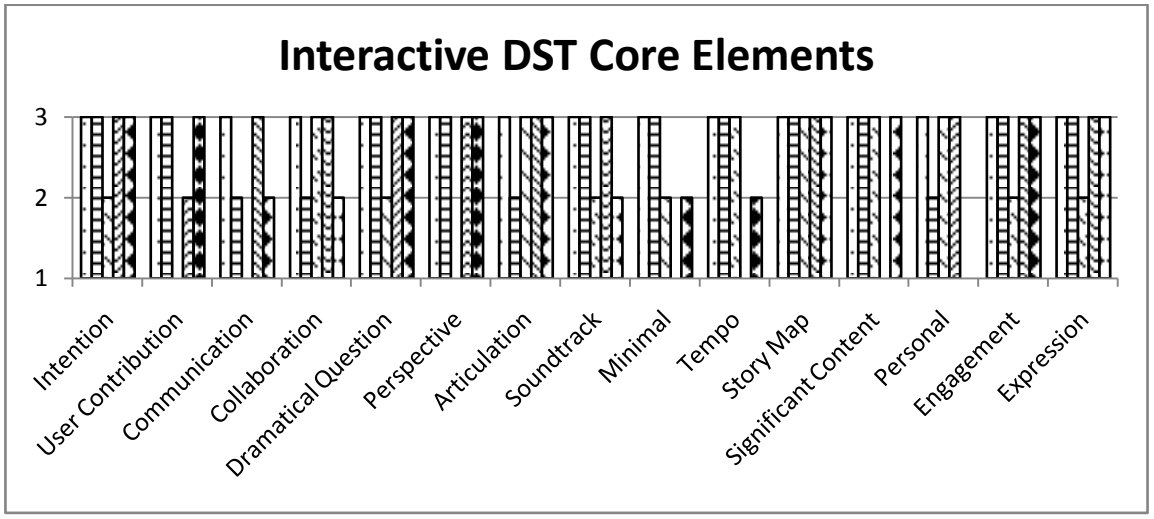


Figure 5.2: Result for Interactive DST Core Elements

Based on the chart plotted in Figure 5.2, it can be seen that 13 of the core elements proposed in the study are agreed by more than three ($3 \leq$) experts on the acceptance of as core elements of interactive DST. The core elements are Intention, User Contribution, Dramatical Question, Perspective, Articulation, Soundtrack, Storymap, Significant Content, Personal, Engagement, Expression, Collaboration and Tempo. All these 13 core elements are to be included as part of the conceptual model.

As stated previously, only core elements with 3 or more Agree are considered as accepted by the experts. The remaining two core elements Communication and Minimal; had only been agreed by two experts, the others two are uncertain and one expert disagreed. The core element communication is about the ability of the audience or user to interact with the story with the interaction either causing changes to the story or none affecting. There is a possibility that the particular element is viewed as similar by the experts with another core element proposed which is User Contribution. User Contribution is the interaction between the audience (or user) with the story towards the creation of content. Since both core elements relate to interaction and influence the flow of the story, core element Communication is discarded off as one of the core elements. Secondly, the core element Minimal is a shared element between interactive and non interactive element. Minimal is about the use of sufficient and unexaggerated materials in developing a DST. In the case of non interactive DST, this very core element is one of the fundamental elements of some of the experts identified in the literature. Even so, the core element Minimal was accepted by only two experts. This is possibly due to the nature of interactivity itself. Injecting interactivity into a DST caused it to be expandable and massive in terms of its content and flow of story, thus shattering the idealism of brevity upholds by the non interactive DST. Therefore coupled with the undecided review of the experts, it is imperative that core element Minimal is removed from the interactive DST core elements.

5.2.3 Conclusion of Expert Review Result

From the reviews on the entire core elements proposed, it can be clearly perceived that 13 elements proposed are accepted by the five experts as core elements. Two of the core elements proposed which is Communication and Minimal are not included in the conceptual model by the researcher, considering the undetermined review by the experts. This decision is made based on the agreement count set on the analysis conducted on the reviews. This finding is very useful in reshaping the proposed conceptual model representing the core element in accordance to the DST experts' feedback.

5.2.4 Final Form of the Conceptual Model of DST Core Elements

The previous section explained in detail regarding the result of the expert reviews conducted. The results of the review by the experts are crucial since it was aimed at obtaining their responds and feedbacks on the core elements proposed hence, the conceptual model representing it. Based on the result acquired the preliminary model of the conceptual model (Figure 4.1) was iterated for the last time. Mental experiment, as elaborated in Chapter 3, was performed again pertaining to the results of the expert review conducted. The output of the final iteration of the conceptual model brings forward the final form of the proposed conceptual model. The Figure 5.3 exhibits the finalized conceptual model.

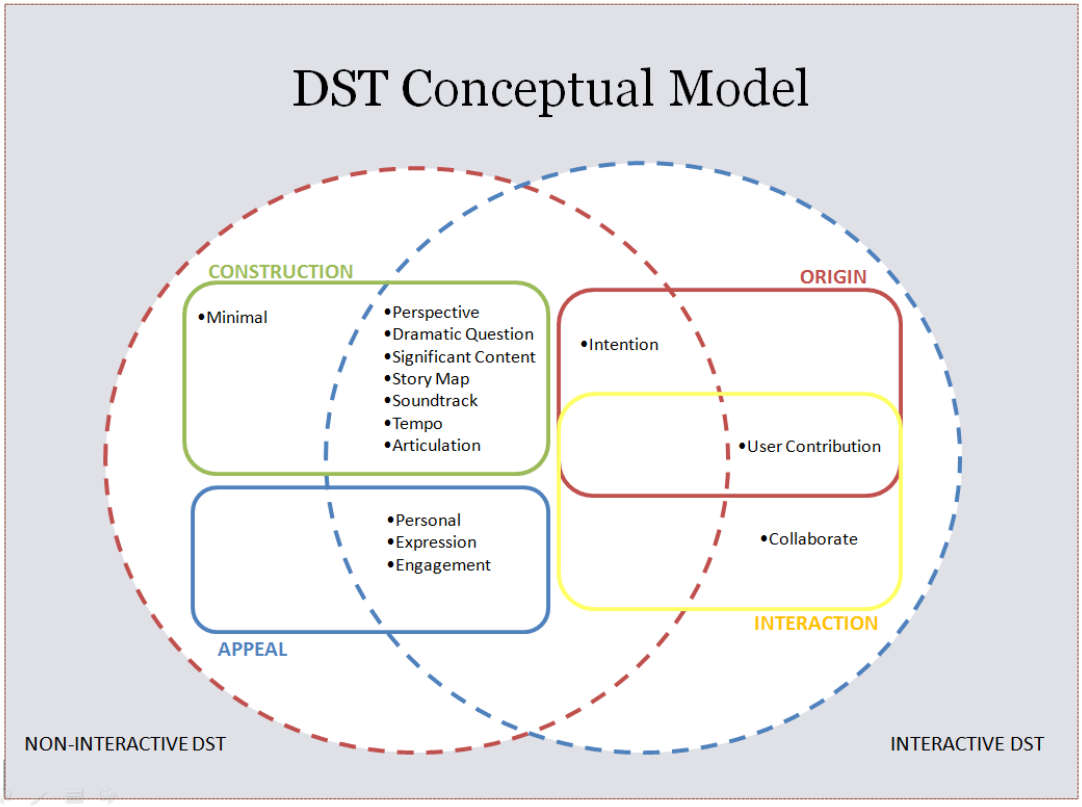


Figure 5.3: Final Form of the Conceptual Model of DST Core Elements

Perceiving the final form of the proposed conceptual model, it is noticeable the conceptual model had a major makeover. The exclusion of two of the interactive core elements (Communication and Minimal) as reviewed by the experts had required momentous alteration of the form. The elimination of Communication as one of the core elements proposed does not give a significant impact of the form of the conceptual model since the singularity nature of it that belonged only to Interactive DST category. Nevertheless, Minimal is a whole different case. Due to the fact that the comparative analysis done in Chapter 4 revealed that it belongs to both categories of DST, eliminating it gave a major impact on the visualization of the conceptual model proposed.

The core elements are populated into four clusters based on the characteristics they carried, which are: Construction, Appeal, Origin and Interaction (as previously discussed in Chapter 4.2.1). However, the model is generally divided into only two parts which are Non-interactive DST core elements and Interactive DST core elements. In each circle contain differences core elements to be encountered.

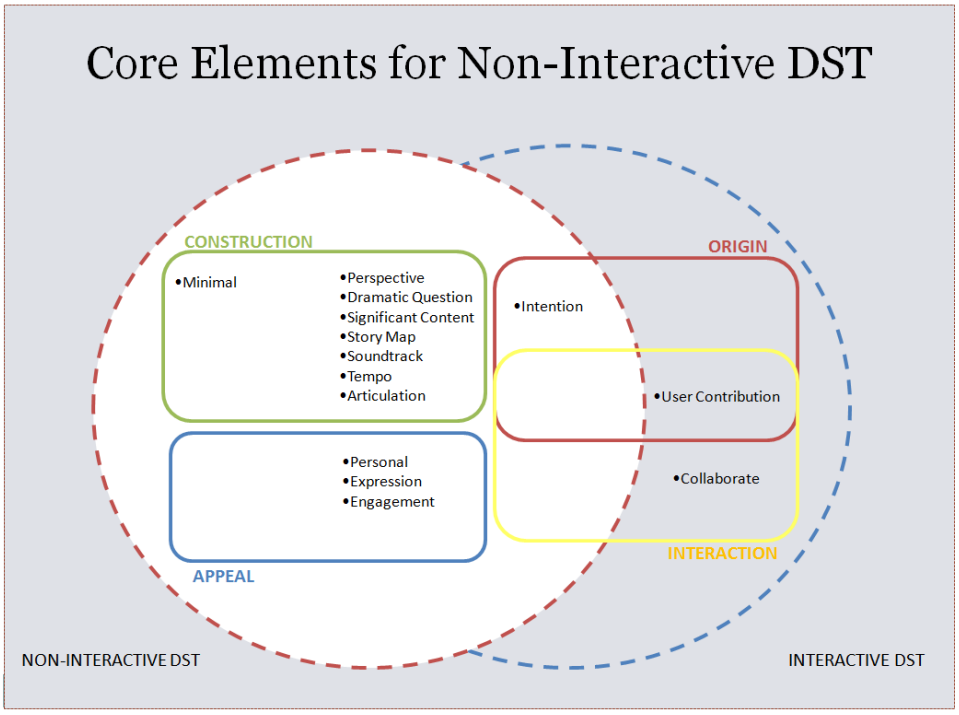


Figure 5.4: Core Elements for Non-interactive DST

For Non-interactive DST developer, the core elements that should particularly be considered are: Intention, Perspective, Dramatic Question, Significant Content, Story Map, Soundtrack, Tempo, Articulation, Personal, Expression, Engagement, and Minimal. The core elements for Non-interactive DST are the area covered in white, as depicted in Figure 5.4.

On the other hand, the core elements for Interactive DST are these 13 core elements: Intention, User Contribution, Collaborate, Perspective, Dramatic Question, Significant Content, Story Map, Soundtrack, Tempo, Articulation, Personal, Expression, and Engagement. The core elements for Interactive DST are as depicted in Figure 5.5.

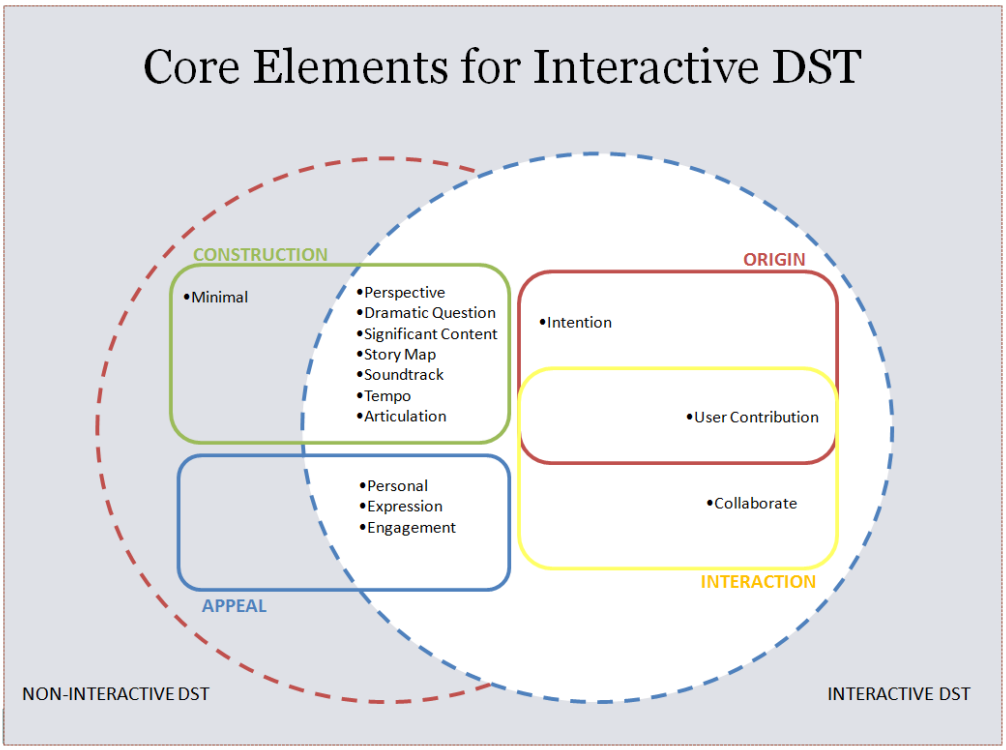


Figure 5.5: Core Elements for Interactive DST

5.3 Users Evaluation Process

After the final form of the conceptual model of DST core elements was re-modelled based on the result of expert review, an evaluation on the quality of the DST conceptual model based on the perception of the users was conducted. The evaluation involved calculation of mean values based on the four constructs used, which are PEOU, PU, PSQ, and US. The evaluation phase involved 62 respondents who are undergraduates

of Bachelor Degree in Multimedia at Universiti Utara Malaysia. The respondents' demography profiles are as presented in Table 5.2. It consists of age, experience in multimedia project development, and experience in digital storytelling development. The table outlines the frequency of each profile and their respective percentage.

Table 5.2: Summary of Respondents' Demography

Profiles	***Categories***	***Frequency (f)***	***Percentage (%)***
Age	21 – 24	59	95.16
	25 – 29	3	4.84
Total		62	100.00
Experience in Multimedia Project Development	Yes	58	93.55
	No	4	6.45
Total		62	100.00
Experiences in Digital Storytelling Development	Yes	32	51.61
	No	30	48.39
Total		62	100.00

Most of the respondents were between 21-24 years old with the frequency of 59 while there were 3 respondents aged between 25-29 years old. Among the 62 persons, 58 of respondents had been involved in multimedia project development which is 93.55% from the total of respondents, while the other 4 respondents (6.45%) claimed they have no experience in multimedia project development. Moreover 51.61% of the respondents had experience in developing DST related

project while 48.39% were the opposite, which equal to 32 persons with experiences and the other 30 who did not have experience in developing DST related project.

5.3.1 Analysis and Findings

This section discusses the descriptive statistical findings of the evaluation of DST conceptual model's quality. The discussion of the findings is in two parts. The early section of the discussion relates to the finding of mean values of the four constructs (PEOU, PU, US, and PSQ). Meanwhile, the second part of the section discusses the mean values based on user experience.

In order to allocate the value of mean obtain, proper respond anchors and values they represent are essentials as shown in Table 5.3. Since the questionnaire used in this study is built in interval scale, the anchors for the scale should be arranged according to their magnitudes and the order of arrangement is in unit of equal intervals (Zikmund, 2003). Item in the categories is adopted from 7 point agreement measure (Gartstein, Shiang, & Bogumill, 2000; Hough & Bryde, 1996; Krosnick, 1999; Luthans, Norman, Avolio, & Avey, 2008), with 6 respond anchors.

For the purpose of this study, the researcher had also set that if the overall mean value is 4.00 and above, the conceptual model would be considered of quality. On the other hand, if the mean value scored below 4.00 the conceptual model is considered as not having quality.

Table 5.3 Respond Anchors and Values

Values			Respond Anchors
1.00	_____	**1.99**	Strongly Disagree
2.00	_____	**2.99**	Disagree
3.00	_____	**3.99**	Somewhat Disagree
4.00	_____	**4.99**	Somewhat Agree
5.00	_____	**5.99**	Agree
6.00	_____	**7.00**	Strongly Agree

Table 5.4 summarizes the results of the evaluation of conceptual model quality by exhibiting the mean (M) value and standard deviation (SD) for the constructs of quality. Specifically the results show the mean value of each construct and the overall mean value scored for quality of the conceptual model.

Based Table 5.4 it is obvious that the result displays the mean values for all constructs are above 4. As for the scores for individual construct, PSQ and US are in the Agree range (mean value above 5) with the mean value of 5.091 and 5.027 respectively. As for the other two constructs, PEOU and PU are in Somewhat Agree range (mean value above 4) with mean value of 4.785 and 4.839 respectively.

Apart from the individual mean value for each construct, Table 5.4 also shows the overall mean value for all constructs. The overall mean value is calculated through the sum value of the four constructs, the mean value is 4.936; based on Table 5.3 the result obtained is somewhat in the Agree range. That also indicates that the overall users perceived the proposed conceptual model of DST as having quality.

Table 5.4 Summary of the evaluation of conceptual model quality

	Item	Mean (M)	Std. Deviation (SD)
	PERCEIVED EASE OF UNDERSTANDING (PEOU)	**4.785**	**.119**
PEOU1	It was easy for me to understand the conceptual model	4.919	1.013
PEOU2	The conceptual model was easy to use	4.741	0.808
PEOU3	I can easily interpret the conceptual model	4.693	0.898
	PERCEIVED USEFULNESS (PU)	**4.838**	**0.114**
PU1	I found the conceptual model useful for understanding the DST	4.758	1.019
PU2	I think the conceptual model improves my performance in completing the task given.	4.919	0.980
	PERCEIVED SEMANTIC QUALITY (PSQ)	**5.091**	**0.082**
PSQ1	The conceptual model correctly represents the DST	5.000	0.992
PSQ2	All the elements in the conceptual model are relevant for DST	5.161	0.978
PSQ3	Overall, the conceptual model gives a complete representation of the DST	5.113	1.026
	USER SATISFACTION (US)	**5.027**	**0.188**
US1	The information provided in the conceptual model was adequate	4.823	0.933
US2	The conceptual model was effective in providing the information	5.065	1.053
US3	Overall, I was satisfied with the conceptual model for providing the needed information	5.194	1.038
	OVERALL	**4.936**	**0.147**

The mean value is also calculated based on the two groups of user as stated in the scope of study in Chapter 1 to determine the perception of quality of the two different groups. Table 5.4 presents the overall mean value score of the two groups of users which are experienced and non-experienced users. The number of

participants representing the experience users were 32 persons and 30 for the non-experience. According to Roscoe (1975) 30 respondents are the minimum sample size needed in each category for sample with sub samples *(as cited in Cavana, et al., 2001)*. In this study the sub-samples are the experience and non-experienced users.

Table 5.5 Mean value by Users Experience Level

Experience in DST development	N	Mean	Std. Deviation
No	30	4.845	0.638
Yes	32	5.037	0.819

Based on Table 5.5 the mean value score by experienced users is 5.037 while for the non-experienced users is 4.845. Looking at the mean values obtained it can be said that the experienced users have a higher mean value. Although the experienced users have a higher mean value than the non-experienced users, an independent-samples t-test was conducted in order to determine if there are significant differences between the means of the two sub-samples. The t-test result is presented in the Table 5.6.

Table 5.6 Independent Sample Test

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Total	Equal variances assumed	1.421	.238	1.020	60	.312	.19090	.18718	-.18352	.56531
	Equal variances not assumed			1.028	58.071	.308	.19090	.18568	-.18076	.56256

Levene's test for equality of variances column shows that the value of *Sig.* = 0.238 is more than .05 (> .05). This means that there is no significant difference in the variance of two groups. For, the result of t-test for comparison of the means of the two independent samples with equal variances assumed, the probability values obtained (from equal variances assumed) are (0.312) more than the alpha value (.05 / 2 = .025). This further confirms that there is no significant difference between the mean values of the two groups.

5.4 Summary

This chapter discusses the outcome of the expert reviews conducted by five selected DST experts whose experience in handling DST exceeds five years. The results of the reviews were plotted on charts to show the frequency of the experts' response analysis. Judging from the analysis of the expert reviews on both non interactive and interactive core elements proposed, it can be safely stated the experts agreed that all 12 core elements proposed for the non interactive DST are necessary as a guidance in developing DST. However, two of the core elements proposed on behalf of interactive DST was undetermined and the researcher opted to expel both of the proposed core elements, then remaining 13 core elements for interactive DST. As for the user evaluation phase, the findings show that each mean value of PEOU, PU, PSQ, and US is positively agreed. The overall mean value is 4.936 which indicates that the users perceived the DST conceptual model as of quality. Additionally, the result in Table 6.4 strengthens the finding by showing that both experience and non-experience users perceived the conceptual model is of quality with the mean value of 5.037 and 4.845.

CHAPTER SIX
CONCLUSIONS

6.1 Chapter Overview

This chapter discusses the outcomes that the study had achieved. This particular study is conducted in order to answer the following four research questions:

- What are the core elements of DST based on the comparison of the sets of element by different experts?
- How can the core elements be represented visually as a conceptual model to support interactive and non-interactive DST?
- How would the conceptual model be evaluated by DST experts and the potential users (digital storyteller)?

The main aim of this study is to propose a DST conceptual model to cater for interactive and non-interactive forms. This chapter elaborates all the questions imposed above.

6.2 Research Question 1

What are the core elements of DST based on the comparison of the sets of element by different experts?

Based on the literature study, seven DST researchers have been identified with their own sets of DST elements. They are Lambert (2006), Porter (2004), Salpeter (2005), Robin (2008), Ohler (2008), Schafer (2008), and Paul and Fiebich (2005). These experts have immersed themselves with DST for some times and from their experiences of handling DST, they have introduced elements of DST that are supposed to guide users in developing a DST. However, as the study emphasized supported by Theory of Cognitive Load (Kalyuga, 2010; Sweller, 2010) in Chapter 1, the elements introduced by these experts are somehow repetitive and redundant that can lead to a question of which one is the proper one to use. How can a user who wants to develop a DST seek a proper singular guide in terms of the elements? By conducting comparative analysis of these elements from the researchers' perspective, commonalities were sought to obtain elements that can be considered as core elements as shown in Appendix A. The elements that have commonality in their purpose and definition were then grouped to produce new elements, for example the core elements of DST. Not limited to that, these core elements were also divided into two categories as stated by the scope of the study which are non interactive and interactive DST. The elements that do not have commonality were deemed as not pivotal enough to become core elements in DST development.

6.3 Research Question 2

How can the core elements be represented visually as a conceptual model to support interactive and non-interactive DST?

Soon as the core elements were identified for both non interactive and interactive DST, they were designed in the form of conceptual model to represent them visually in an easier form for users to perceive.The core elements were gathered under four clusters adapted from Schafer (2008). The clusters are Origin, Construction, Interaction, and Appeal. These clusters are supposed to distinguish the elements' purpose and used as guidance in DST development. Apart from that, the conceptual model also depicts the division of the DST categories which are non interactive and interactive. The final conceptual model is as proposed in Figure 5. 3. Presenting it visually has gone through three iterations and a review by five experts.

6.4 Research Question 3

How would the conceptual model evaluate by DST experts review and the potential users (digital storyteller)?

In an effort to get a proper review of the core elements proposed, the conceptual model was reviewed by five experts of DST. The review intention was to get the experts' feedbacks on the core elements proposed either agree or disagree with the inclusion of the proposed core elements. Based on the review conducted, the results were then plotted as bar charts. Judging from the charts, the experts agreed with the 11 of the core elements proposed for non interactive DST development, except for Articulation that had only two agree votes from the experts. The researcher has

accumulated literatures to highlight the importance of voice inclusion in DST; to allow it to be included into the conceptual model. Nonetheless, the experts' reviews on the core elements of interactive DST are not entirely positive. Even though they agreed on the 13 of the core elements proposed, the elements: Communication and Minimal had only been agreed by two experts, two experts uncertain and another expert disagreed. These reflect that the experts were undetermined that these two elements are needed as core elements of interactive DST. This is solidified with the researcher's consent and assumptions that both core elements are not included as interactive DST's core elements.

After the refinement based on the expert reviews, the conceptual model was distributed to the potential users to gain the perception of users on the quality of the conceptual model. For this purpose, an evaluation was conducted through a questionnaire and distributed to a group of potential users. Based on the data collected the descriptive analyses were conducted as discussed in Chapter 6. The overall mean value of 4.936 indicating that the users give a positive feedback on the quality of the proposed conceptual model. Apart from the overall mean value, the mean values of experience and non-experience users were also determined which are 5.037 and 4.845**.** The results from both groups of user were indeed positive, which indicated that the conceptual model is of quality. Based on the positive mean value obtained, it is clear that the users perceived that the proposed conceptual model is of quality and this answers the third research question.

6.5 Meeting the Objectives of Research

There are four objectives of the study. The very first objective formed is to identify the core elements of digital storytelling that represent interactive and non-interactive forms. The second objective is to construct a conceptual model of the identified DST core elements. The third objective is to get the experts to review on the proposed conceptual model in order to affirm their stand on the core elements identified. The fourth objective is to determine the quality of the proposed DST core elements conceptual model from users' perspectives.

The first objective is achieved by conducting intensive and exhaustive literature study on DST. All credible sources were studied in order to acquire an existing set of elements by DST experts. The elements then were compared to seek commonality among the elements of different experts. The commonality found marked the elements as proposed core elements of the study. The second objective is achieved by grouping the identified core elements under the four clusters adapted from Schafer (2008). The clusters then were divided into two categories based on the scope of the study, which are non interactive and interactive DST. The categories, clusters and the core elements were grouped then visualized graphically. This was done in order to provide a better and easier understanding of the core elements proposed as a guide to DST development. The third objective is achieved by conducting experts review on the conceptual model representing the core elements and survey of the potential users in order to determine the quality of the conceptual model proposed. The review was conducted on five people who have been dealing with DST for more than five years. Some of them wrote books and actively mentor

DST workshops and training. The heuristics representing each of the core elements proposed was reviewed by them and the results of the review were then plotted on charts. The acceptance of the core elements proposed was determined by the feedback of the experts' review. Finally, a survey of the potential users was undertaken in order to determine the quality of the proposed conceptual model. The findings determined by mean value, evidently show that the experienced and non-experienced users perceive the conceptual model as of quality. This can be seen from the mean values obtained which are 5.037 and 4.845 respectively. By achieving these three objectives, the main aim of the study which is to propose a set of core elements is also accomplished, hence completing the study.

6.6 Limitation and Future Works

In order to ensure that the study is feasible in the given time frame and resources, scopes of study have been fabricated. This particular study only manages to find eight experts of DST with their own set of DST elements. It is hoped that more experts with their own set of elements would be discovered. This way the conceptual model would be more centralized and representative as the guide to DST development.

Based on the elements identified, core elements of DST were proposed and visually depicted by a conceptual model. Furthermore, to better structure the core elements, they were grouped under four clusters of DST as adapted from Schafer (2008) and this particular study divides DST clearly into two categories which are non interactive and interactive to avoid any confusion. However, this study is yet to

prove that the core elements proposed are practically useable as a guide to develop those two categories of DST since there is no prototyping involved.

Apart from that, to acquire feedback on the conceptual model constructed, expert review was conducted. The experts involved were limited to five people and it is expected that if more experts were involved, the conceptual model would perhaps gain more comments.

The users' evaluation on the conceptual model was conducted in order to measure the quality of the proposed conceptual model from the user's perspective. A total of 62 respondents were involved inclusive the ones with and lack of experience in digital story domain. Increasing the number of respondents would contribute to the accuracy in the measurement of the conceptual model's quality. However the scoped population for this study is limited to the potential users among multimedia student in UUM. The samples in this study were purposely selected, which may limit the generalizability of results. Furthermore, the samples ages were limited, which influences the precision of observations.

Looking at the limitations explained it is obvious that the conceptual model along with the core elements proposed have room for improvement. There are works to be done in future to solidify and consolidate the conceptual model as a guide to the development of non interactive and interactive DST. Further study on the particular matters mentioned is necessary to nurture and enrich studies conducted on DST.

6.7 Conclusion

The study was conducted in the first place from realizing that there is more than a single set of elements that guide the development of DST and some of them are not even clear whether it is trying to guide non interactive or interactive DST. Upon that, core elements of DST which cater both interactive and non-interactive DST were proposed; then were visualized via a graphical conceptual model. The proposed conceptual model was then reviewed by the experts to solidify the decision whether all core elements proposed were really necessary as guides to develop DST. For further validation, the conceptual model was distributed to the potential user to evaluate the quality of the conceptual model from the users' perception. The result of this process was analyzed using mean analysis and result come out showing that the proposed model is of quality. Based on the outcome gain from this study, it is hoped that the conceptual model proposed would contribute to the pool of knowledge of DST researches.

DST has become a formal medium to educate students in learning institutions. Figg and Burson (2010) had suggested four common formats of digital stories that are applicable in the classroom, which are: Slideshows, Tutorials, eBooks, and Presentations. DST uses multimedia as a medium to assist students in understanding new ideas that were conveyed to them. Teachers can use various kinds of DST as a tool to assist them in the teaching process in the classroom. DST can be applied as anticipatory tools to engage students at the beginning of the lesson, an access to facilitate discussion of the topic, and a way to present an abstract or conceptual content in a more understandable form (Robin, 2006). DST does not just help teacher

to convey the teaching but it also benefits the students as well. There are many advantages that DST brings to the learning process. Classroom's assignment using DST on a certain topic not only would engage them on the topic, cultivate students' involvement in the classroom and indirectly sharpen their literacy skills (Lowenthal, 2009; Robin, 2006). The conceptual model from this study is hoped to be a guidance for the implementation of DST in the educational field.

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Appendix A

Analysis of Digital Storytelling Elements

Analysis of Digital Storytelling Elements' (with Commonalities)

Group	EXPERTS						
	Lambert	Porter	Salpeter	Robin	Ohler	Schafer	Paul & Fiebich
	Elements in Common						
1	Point of View			The narrator's point of view	Point of View		
2		Unfolding lesson learned		The overall purpose of the story		User contribution	
3		Living in your story	Are Personal				
4	A Dramatic Question	Developing creative tension		A Dramatic Question			
5	Emotional Content				Emotional engagement	Immersion	
6	The Gift of your Voice				Spoken narrative		
7	Power of Sound track			Use of meaningful audio sound track	Soundtrack music		
8	Economy	Economizing the story told	Are concise Use readily available source materials	Economy of the story detail	Time, story length and economy Role of video and performance		
9	Pacing			Pacing of the narrative	Tone		
10			Including universal story elements			(Conceptual) Structure	
11		Showing not telling		Choice of content Quality of the image, video			
12	Economy	Developing craftsman ship					
13			Involve collaboration			Collaboration	Communication
14						Control Interactivity	(User) Action
15						User contribution	(Open) Relationship

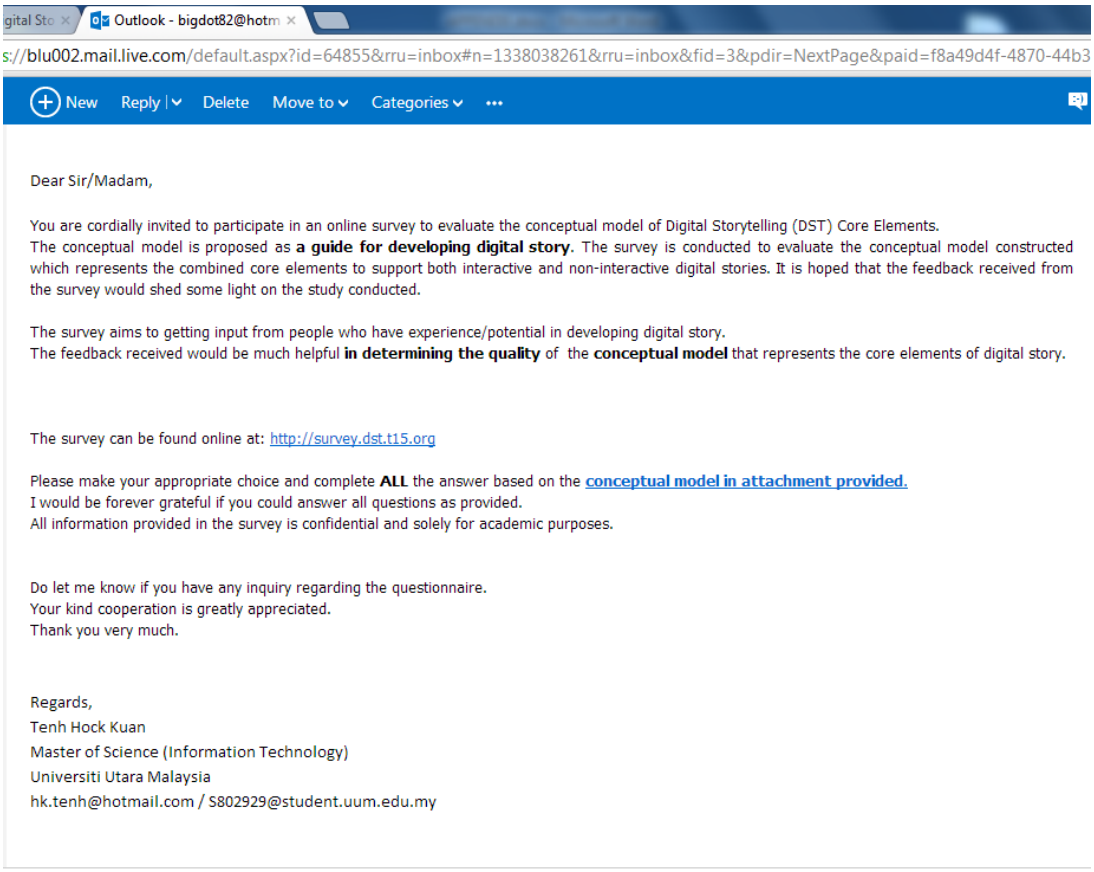
Analysis of Digital Storytelling Elements' (with No Commonalities)

	Elements with No Commonality						
			Begin with the story/script	Good grammar and language use	Creativity and originality	Continuity	Media
				Clarity of voice		Concreteness	Context
						Coherence	
						Cognitive effort	
						Virtuality	
						Spatiality	

Appendix B

Expert Review Questionnaire

Cover Letter



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New Reply Delete Move to Categories ...

Dear Sir/Madam,

You are cordially invited to participate in an online survey to evaluate the conceptual model of Digital Storytelling (DST) Core Elements.
The conceptual model is proposed as **a guide for developing digital story**. The survey is conducted to evaluate the conceptual model constructed which represents the combined core elements to support both interactive and non-interactive digital stories. It is hoped that the feedback received from the survey would shed some light on the study conducted.

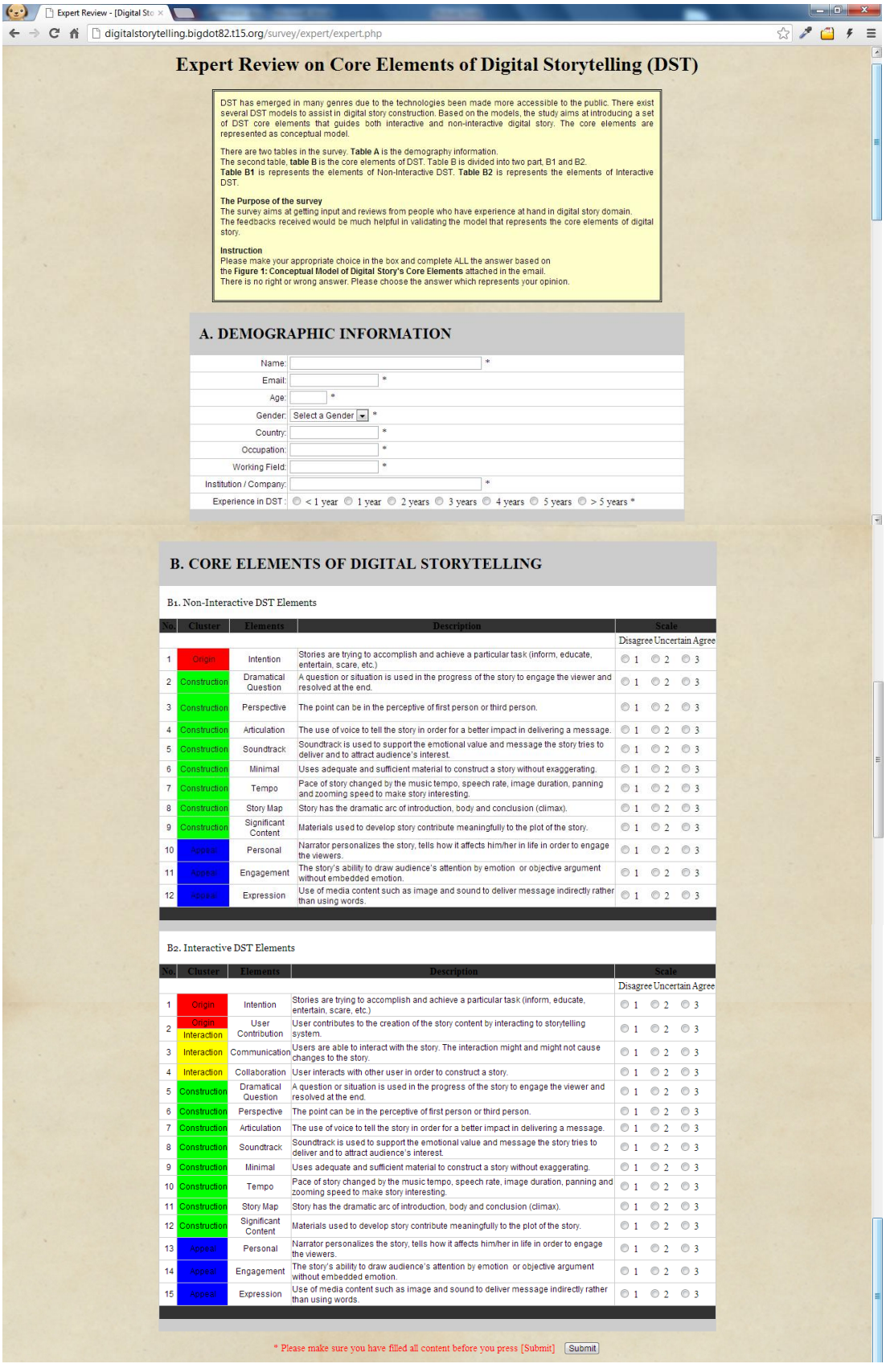
The survey aims to getting input from people who have experience/potential in developing digital story.
The feedback received would be much helpful **in determining the quality** of the **conceptual model** that represents the core elements of digital story.

The survey can be found online at: http://survey.dst.t15.org

Please make your appropriate choice and complete **ALL** the answer based on the **conceptual model in attachment provided.**
I would be forever grateful if you could answer all questions as provided.
All information provided in the survey is confidential and solely for academic purposes.

Do let me know if you have any inquiry regarding the questionnaire.
Your kind cooperation is greatly appreciated.
Thank you very much.

Regards,
Tenh Hock Kuan
Master of Science (Information Technology)
Universiti Utara Malaysia
hk.tenh@hotmail.com / S802929@student.uum.edu.my



Expert Review - [Digital Sto

digitalstorytelling.bigdot82.t15.org/survey/expert/expert.php

Expert Review on Core Elements of Digital Storytelling (DST)

DST has emerged in many genres due to the technologies been made more accessible to the public. There exist several DST models to assist in digital story construction. Based on the models, the study aims at introducing a set of DST core elements that guides both interactive and non-interactive digital story. The core elements are represented as conceptual model.

There are two tables in the survey. **Table A** is the demography information.
The second table, **table B** is the core elements of DST. Table B is divided into two part, B1 and B2.
Table B1 is represents the elements of Non-Interactive DST. **Table B2** is represents the elements of Interactive DST.

The Purpose of the survey
The survey aims at getting input and reviews from people who have experience at hand in digital story domain.
The feedbacks received would be much helpful in validating the model that represents the core elements of digital story.

Instruction
Please make your appropriate choice in the box and complete ALL the answer based on
the **Figure 1: Conceptual Model of Digital Story's Core Elements** attached in the email.
There is no right or wrong answer. Please choose the answer which represents your opinion.

A. DEMOGRAPHIC INFORMATION

Name: *
Email: *
Age: *
Gender: Select a Gender *
Country: *
Occupation: *
Working Field: *
Institution / Company: *
Experience in DST : < 1 year | 1 year | 2 years | 3 years | 4 years | 5 years | > 5 years *

B. CORE ELEMENTS OF DIGITAL STORYTELLING

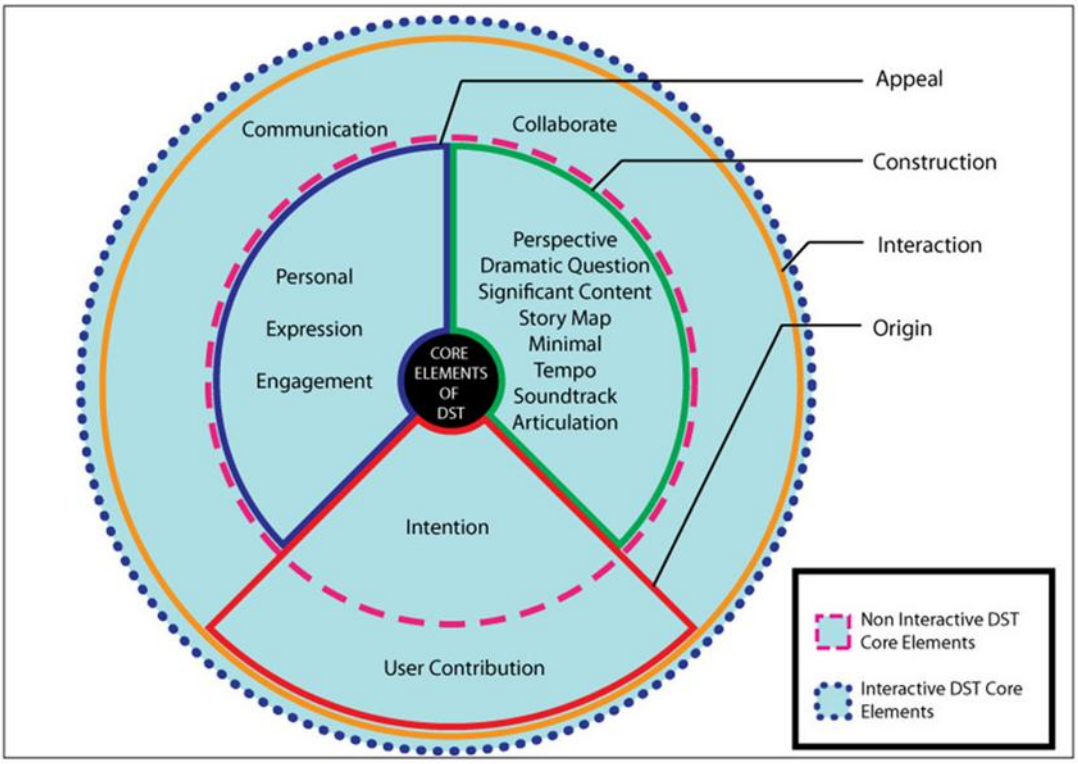
B1. Non-Interactive DST Elements

No.	Cluster	Elements	Description	Scale
				Disagree Uncertain Agree
1	Origin	Intention	Stories are trying to accomplish and achieve a particular task (inform, educate, entertain, scare, etc.)	1 2 3
2	Construction	Dramatical Question	A question or situation is used in the progress of the story to engage the viewer and resolved at the end.	1 2 3
3	Construction	Perspective	The point can be in the perceptive of first person or third person.	1 2 3
4	Construction	Articulation	The use of voice to tell the story in order for a better impact in delivering a message.	1 2 3
5	Construction	Soundtrack	Soundtrack is used to support the emotional value and message the story tries to deliver and to attract audience's interest.	1 2 3
6	Construction	Minimal	Uses adequate and sufficient material to construct a story without exaggerating.	1 2 3
7	Construction	Tempo	Pace of story changed by the music tempo, speech rate, image duration, panning and zooming speed to make story interesting.	1 2 3
8	Construction	Story Map	Story has the dramatic arc of introduction, body and conclusion (climax).	1 2 3
9	Construction	Significant Content	Materials used to develop story contribute meaningfully to the plot of the story.	1 2 3
10	Appeal	Personal	Narrator personalizes the story, tells how it affects him/her in life in order to engage the viewers.	1 2 3
11	Appeal	Engagement	The story's ability to draw audience's attention by emotion or objective argument without embedded emotion.	1 2 3
12	Appeal	Expression	Use of media content such as image and sound to deliver message indirectly rather than using words.	1 2 3

B2. Interactive DST Elements

No.	Cluster	Elements	Description	Scale
				Disagree Uncertain Agree
1	Origin	Intention	Stories are trying to accomplish and achieve a particular task (inform, educate, entertain, scare, etc.)	1 2 3
2	Origin Interaction	User Contribution	User contributes to the creation of the story content by interacting to storytelling system.	1 2 3
3	Interaction	Communication	Users are able to interact with the story. The interaction might and might not cause changes to the story.	1 2 3
4	Interaction	Collaboration	User interacts with other user in order to construct a story.	1 2 3
5	Construction	Dramatical Question	A question or situation is used in the progress of the story to engage the viewer and resolved at the end.	1 2 3
6	Construction	Perspective	The point can be in the perceptive of first person or third person.	1 2 3
7	Construction	Articulation	The use of voice to tell the story in order for a better impact in delivering a message.	1 2 3
8	Construction	Soundtrack	Soundtrack is used to support the emotional value and message the story tries to deliver and to attract audience's interest.	1 2 3
9	Construction	Minimal	Uses adequate and sufficient material to construct a story without exaggerating.	1 2 3
10	Construction	Tempo	Pace of story changed by the music tempo, speech rate, image duration, panning and zooming speed to make story interesting.	1 2 3
11	Construction	Story Map	Story has the dramatic arc of introduction, body and conclusion (climax).	1 2 3
12	Construction	Significant Content	Materials used to develop story contribute meaningfully to the plot of the story.	1 2 3
13	Appeal	Personal	Narrator personalizes the story, tells how it affects him/her in life in order to engage the viewers.	1 2 3
14	Appeal	Engagement	The story's ability to draw audience's attention by emotion or objective argument without embedded emotion.	1 2 3
15	Appeal	Expression	Use of media content such as image and sound to deliver message indirectly rather than using words.	1 2 3

* Please make sure you have filled all content before you press [Submit] Submit



CLUSTER	ELEMENT	DESCRIPTION
Origin	Intention	Stories are trying to accomplish and achieve a particular task (inform, educate, entertain, scare, etc.)
Origin Interaction	User Contribution	User contributes to the creation of the story content by interacting to storytelling system.
Interaction	Communication	Users are able to interact with the story. The interaction might and might not cause changes to the story.
Interaction	Collaboration	User interacts with other user in order to construct a story.
Construction	Dramatical Question	A question or situation is used in the progress of the story to engage the viewer and resolved at the end.
Construction	Perspective	The point can be in the perceptive of first person or third person.
Construction	Articulation	The use of voice to tell the story in order for a better impact in delivering a message.
Construction	Soundtrack	Soundtrack is used to support the emotional value and message the story tries to deliver and to attract audience's interest.
Construction	Minimal	Uses adequate and sufficient material to construct a story without exaggerating.
Construction	Tempo	Pace of story changed by the music tempo, speech rate, image duration, panning and zooming speed to make story interesting.
Construction	Story Map	Story has the dramatic arc of introduction, body and conclusion (climax).
Construction	Significant Content	Materials used to develop story contribute to the plot of the story.
Appeal	Personal	Narrator personalizes the story, tells how it affects him/her in life in order to engage the viewers.
Appeal	Engagement	The story's ability to draw audience's attention by emotion or objective argument without embedded emotion.
Appeal	Expression	Use of media content such as image and sound to deliver message indirectly rather than using words.

Appendix C

User Evaluation Questionnaire

CONCEPTUAL MODEL OF DIGITAL STORYTELLING CORE ELEMENTS: Evaluation of the conceptual model based on user perception

Digital storytelling (DST) had emerged in various genres due to the technologies is being made more accessible. Hence there are several DST models available for helping developed digital story. Core elements of DST are proposed as a guide for developing DST based on the compilation of existing models. Core elements of DST are taking into consideration of Interactive DST and Non-Interactive DST. The refinement of the existing models has produced a conceptual model which represents the combined core elements to support both interactive and non-interactive DST.

The Purpose of the survey

The survey was conducted to evaluate the conceptual model of DST core elements based on user perceptions.

Instruction

There is no right or wrong answer. Please go through Diagram A. Based on the explanation that you have heard, please provide your honest opinion by circling the point the most represent your perception.

Part A. Demographic Information

1. Age: _____

2. Current Course/Field: _____

3. Current Years of study: _____

4. Do you have experiences in Multimedia Project Development?

Yes ☐ No ☐

5. Do you have experiences in Digital Storytelling Development?

Yes ☐ No ☐

PART B : Evaluation

Indicate the extent to which you agree with the following statements, by **circling** the appropriate number at the scale given.

Perceived Ease of Understanding (PEOU)

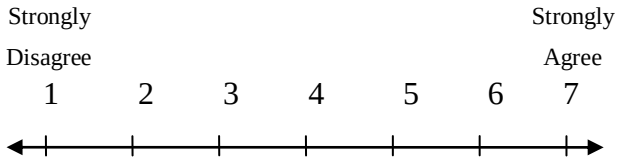
		Strongly Disagree						Strongly Agree
1.	It was easy for me to understand the conceptual model	1	2	3	4	5	6	7
2.	The conceptual model was easy to use	1	2	3	4	5	6	7
3.	I can easily interpret the conceptual model	1	2	3	4	5	6	7

Perceived Usefulness (PU)

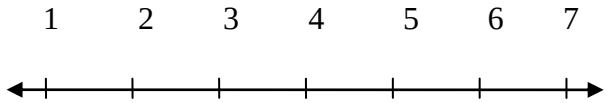
		Strongly Disagree						Strongly Agree
1.	I found the conceptual model useful for understanding the DST	1	2	3	4	5	6	7
2.	I think the conceptual model improves my performance in completing the task given.	1	2	3	4	5	6	7

Perceived Semantic Quality (PSQ)

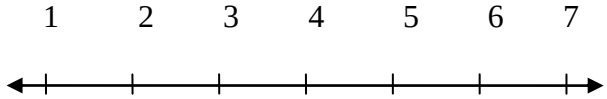
1. The conceptual model correctly represents the DST



2. All the elements in the conceptual model are relevant for DST

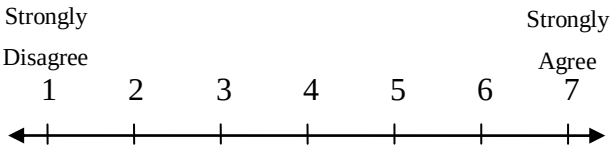


3. Overall, the conceptual model gives a complete representation of the DST

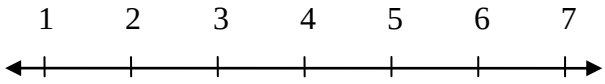


User Satisfaction (US)

1. The information provided in the conceptual model was adequate



2. The conceptual model was effective in providing the information



3. Overall, I was satisfied with the conceptual model for providing the needed information

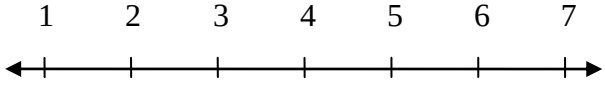
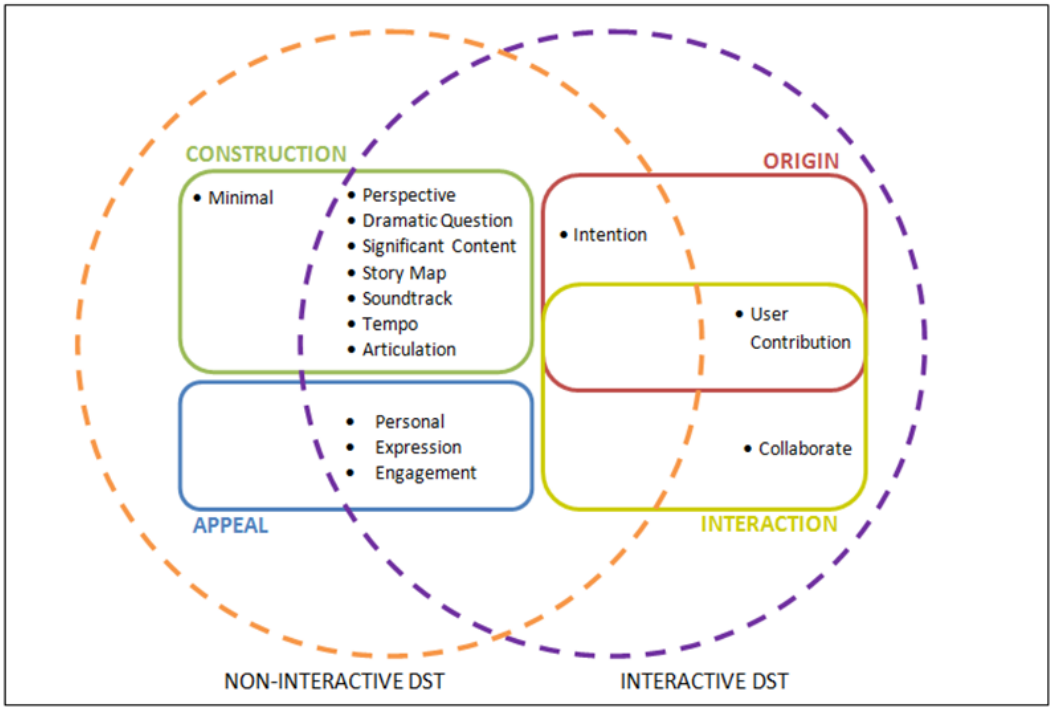


Diagram A



CORE ELEMENT OF DIGITAL STORYTELLING

CLUSTER	ELEMENT	DESCRIPTION
Origin	Intention	Stories are trying to accomplish and achieve a particular task (inform, educate, entertain, scare, etc.)
Origin Interaction	User Contribution	User contributes to the creation of the story content by interacting to storytelling system.
Interaction	Collaboration	User interacts with other user in order to construct a story.
Construction	Dramatical Question	A question or situation is used in the progress of the story to engage the viewer and resolved at the end.
Construction	Perspective	The point can be in the perceptive of first person or third person.
Construction	Articulation	The use of voice to tell the story in order for a better impact in delivering a message.
Construction	Soundtrack	Soundtrack is used to support the emotional value and message the story tries to deliver and to attract audience's interest.
Construction	Minimal	Uses adequate and sufficient material to construct a story without exaggerating.
Construction	Tempo	Pace of story changed by the music tempo, speech rate, image duration, panning and zooming speed to make story interesting.
Construction	Story Map	Story has the dramatic arc of introduction, body and conclusion (climax).
Construction	Significant Content	Materials used to develop story contribute to the plot of the story.
Appeal	Personal	Narrator personalizes the story, tells how it affects him/her in life in order to engage the viewers.
Appeal	Engagement	The story's ability to draw audience's attention by emotion or objective argument without embedded emotion.
Appeal	Expression	Use of media content such as image and sound to deliver message indirectly rather than using words.