ENHANCING MUSEUM ARTIFACT COLLECTIONS BY USING INTERACTIVE MEDIA APPLICATIONS

By Mr. Atithee Chaetnalao

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy Program in Design Arts International Program Graduate School, Silpakorn University Academic Year 2014
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The Graduate School, Silpakorn University has approved and accredited the Thesis title of “Enhancing Museum Artifact Collections by Using Interactive Media Applications” submitted by Mr. Atithep Chaetnalao as a partial fulfillment of the requirements for the degree of Doctor of Philosophy in Design Arts.

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This research is aimed to examine the problem of conventional display factors in museum artifact collection by enhancing the application of interactive media technologies. The single case is the U-Thong National Museum, Suphanburi, Thailand. The study proposes a scope of framework focuses on the traditional medias, non-interactive medias in the Museum. The critical of limitation and its constraints of archeological objects become an opportunity of investigation. The new solution has been proposed to work in actual exhibition space. Therefore, the experiment of suitable interactive medias become key factors of enhancing museum’s display to attracts the public.

The research methodology included site visited, observation of museum circumstances and its circulations, designed pre and post questionnaire, an interview with stakeholders especially, Director of the Museum, an inspection and improvement through process of study. After a series of conceptualizing and experimental processes, the method leads to designed an actual concept names “The Replay: U-Thong Sri Dvaravati” which constructed and installed six different contents and zones. The exhibition was set at actual site in U-Thong Museum. The exhibition was opened to the public during November 2012. The data was collected and analyzed through the reflection of audiences that increasing during a month of exhibition.

The result of the research is clearly addressed the positive factor of using interactive media technologies in museum artifact collections. It obviously can stimulate, create interesting and permits audiences to pay more attention in museum new medias and content. It can provide more new experience learning opportunities, emotions and memorability. Moreover, the prototype exhibition had positive feedback from various of its target group, the museum audiences. In conclusion of the thesis also proposes the new model of enhancing museum artifact’s by using appropriate interactive medias, that becomes a new knowledge and academic contribution throughout this research project.
Acknowledgments

Enhancing Museum Artifact Collections by Using Interactive Media Applications, the thematic and topic of my thesis, like a pilgrim that reach the thesis through suggestions and advice from my supervisor; Assistant Professor Veerawat Sirivesmas, Ph.D., my advisor, Waranan Sowannee, Ph.D. I have been grateful for their inspiration, advice, teaching, encouragement, and support since I develop the idea of this thesis. Thank you to Professor Mustaffa Halabi Azahari, Ph.D., pleased to be the member for my Thesis examination.

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Thanks to the Director of U-Thong National Museum who is Mr. Proboot Chantachok given permission to take the U-Thong National Museum to be the design case study and with all support from museum staff through this research, experimental project and exhibition show.

I am particularly thankful to Miss. Nichakan Chaiyajuk who help me through the development of my thesis and also my team support who are students from Interactive Design Department, School of Digital Media, Sripatum University; Mr.Thawatchai Saing, Mr. Thanet Jearanaivachira, Mr. Surachet Methep, Mr. Saravut Munkong, Mr. Thanet Artjinada, for all field experiment work and design process work supporting the project including content, technique, sound editing and programming.

This work is dedicated to my farther Mr. Theum Chaetnalao, who had been passed away and I would like to thank my family, especially my mother Miss. Phanet Chaetnalao, also thank to Mrs. Phanom Rugkrach my older sister, Mrs. Panita Chaetnalao my younger sister, for their love and support throughout my education.

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Chapter 1
Background of the Study

1.1 Background and Significance of the Problem

Nowadays technology extensively contributes to museum exhibitions under a new pattern of learning by using new media technology to build learning in which visitors can further participate. Museums play a significant role as learning centers, especially when they provide interactive experiences, which may or may not be technologically enhanced. The best learning in museums occurs when people are engaged cognitively, physically and emotionally. Establishing this new pattern of learning museum requires a high budget to use modern technology for presentations throughout the exhibitions with maintenance by specific experts resulting in many limitations. Thus, only the replete or planned museum can build this new pattern. At present, many museums which demonstrate ancient artifacts or works of art are still deficient in budget and knowledge of how to develop their museums to utilize the new presentation pattern. The conventional exhibition approach emphasizes either the setting of objects for all-round visualization or showcases in the case of small objects or those which require high security.

The signs provided only explain the history and significance of antiques through common presentation and are less attractive. At present, the behavior of visitors is changing as both their age and their interest in visiting museums have gradually decreased. In addition, modern technology has played an important role so a gap in the interest levels in visiting museums has occurred because communication methods forming links between audiences and artifacts face difficulties in making visitors understand. As a result, museums are not popular for people since they are perceived as mainly a place to keep old objects, resulting in the numbers of audiences to museums decreasing. Moreover, most visitors represent an audience

who are really interested in study details such as students, teachers, lecturers, professors and archeological and historical scholars.

An article to solve the museum problem by Assoc. Prof. Dr. Srisak Walliphodom\(^2\) stated that museum is a learning source to support the learning process and it is not only a place for containing knowledge or object storage. Such museums are probably exciting but ultimately the visitors do not feel changes. The main duty of the museum is to be a source to inspire and motivate people to acquire more knowledge and to help them to find knowledge\(^3\). Although the artifacts exhibited are valuable to those with full knowledge, their pattern of presentation still motivates learning. It was found that the number of visitors who visited many Thai museums, especially the national museum and including the local ones, has gradually decreased every year.

According to the report arranged by Mr. Anan Chuchoti, the Director of the National Museum of the Fine Art Department, the statistics for visitors to a total of 42 national museums in the 2011 fiscal year showed a decrease in comparison with the figures from 2010. The cause was that the Fine Art Department received an annual budget of only 20-30 million baht to develop the 42 national museums, while another budget of 1,000 million baht was allocated for restoring historical sites, so museum development could not be achieved as planned\(^4\). However, this problem did not simply arise in 2011. It has appeared over a long period resulting in many current museums where exhibits of ancient items and art objects limited of the budget for development of the presentation formatted.

In addition, Mr. Theera Salakphet, the Parliamentary Secretary of the Ministry of Culture, stated in the article that children, youths and people in general

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\(^2\)The head of the working team about the content of the museum of the National Discovery Museum Institute and one who impels the building of knowledge of the people in the form of the community museum.


\(^4\)Dailynews, The Fine Art Department revealed the statistics of visitors of the 42 museums decreased and it was dumbstruck that there were only five foreigners to visit some museums a year, accessed May 2, 2013, available from http://www.dailynews.co.th/Content/education/37876.
were not interested in visiting the museum. The local learning sources were under-utilized because the public thought that the management within the museums was not interesting, they were old places and they contained untidy objects. They seemed to be only for storage and there was nothing attractive to visit. Regarding the development of the new museum pattern, the private sector is required to jointly plan new management and administration. In particular, the presentation pattern from overseas will be used as a model at the National Museum and will make distinctions for antiques and art objects. Multimedia technology, light, color and sound effects would help to attract visitors’ interest. From the study, it was found that many museums have tried to develop and solve this problem by using various ways and technologies for presentation in the new pattern of learning museums to create new learning experiences for visitors. Nevertheless, to form this new pattern of learning museum requires a high budget because exhibitions using modern technology as presentation media result in high costs and require careful maintenance. The design process and development must be controlled by specific experts and many limitations still exist.

These important issues form the essence of this research and originate from the current popularity in Thai museums of using new media called interactive media for the exhibitions. This media can increase interest, enjoyment, and understanding of contents; for example, Museum Siam, Discovery Museum, Rattanakosin Exhibition Hall and the Dragon Descendants Museum. These museums have applied the exhibition model from museums overseas such as the National Museum of Singapore. Although the response from visitors is excellent, museum in Thailand still cannot improve or build new ones. There are objectives, budgets, activities as an important propellant. Thus, objects exhibited within the museum must be tangible throughout. The interactive media technology supported the exhibition so that visitors could participate with contents and objects to explain meaning of the story and completely link with things. See Siam Museum, Philosophy of the National Discovery Museum Institute, accessed March 4, 2013, available from http://www.museumsiam.com/about.php.

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6. These museums would propose the creative and enjoyable pattern by using activities as an important propellant. Thus, objects exhibited within the museum must be tangible throughout. The interactive media technology supported the exhibition so that visitors could participate with contents and objects to explain meaning of the story and completely link with things. See Siam Museum, Philosophy of the National Discovery Museum Institute, accessed March 4, 2013, available from http://www.museumsiam.com/about.php.
places, organization patterns, learning behaviors and perspectives of visitors as the problems and limitations.

All the above mentioned points lead this research to focus on the study of using the interactive media in the conventional exhibitions of museum artifacts collections that exhibited antique and art objects under the determined framework. The interactive media perspective was used to integrate with the exhibition of artifacts for the purpose of adding liveliness and new experiences for learning, perceptions and feelings of visitors at the original museum. In addition, it is the perspective for creation, development, adaptation and combination to create interest and animation in museums which exhibit this pattern. It was also the gradual development as appropriate and it was not all dramatic changes or a quantum leap.

1.2 Objectives of the Research

1.2.1 To examine current of conventional methods that has been practices of museum artifact collections in the selected museum in Thailand.

1.2.2 To experiment the potential of using an alternative tool of interactive media technologies for museum artifact collections.

1.2.3 To develop suitable interactive media technologies for museum artifact collections that can enhance the interest of public.

1.3 The Questions of the Research

1.3.1 How interactive media technologies can be used as an alternative tool of choice for museum artifact collections?

1.3.2 How interactive media technology can create visual interest to museum artifact collections?

1.3.3 How to discover a model that allows creating interesting museum artifact collections and enhancing the interest of public?

1.4 The Importance of the Research

The research has considerable significance for the problem of interest deficiency in exhibitions in museum artifact collections. Thus, this research would propose the alternative by using the conceptual model to add atmosphere and liveliness for artifacts. The development would be created from the conventional
museum, exhibition and atmosphere to increase interest and new experiences by presenting the interactive media integration process. It focused on experiences of participation of visitors to artifacts for their learning through emotions and memories. Moreover, it could be used as the model for museum artifact collections and other similar museums.

1.5 Scope of the Study

To conduct the research in accordance with the determined objectives, the researcher classified the scope in three aspects: information, population and creative design as follows:

1.5.1 Scope of information

1.5.1.1 To study current interactive media technologies that can be applied in museum exhibitions.

1.5.1.2 To study the exhibitions in museum artifact collections in Thailand.

1.5.1.3 To study the techniques of modern museum using of interactive media technologies in the exhibition.

1.5.1.4 To study the current conventional exhibition and space design in a case study of U-Thong National Museum.

1.5.1.5 To study behavior, perceptions and experiences of audiences who visited the prototype exhibition by using interactive media technology with the artifacts in the conventional exhibition site of U-Thong National Museum.

1.5.2 Scope of population

1.5.2.1 The audience who visited conventional exhibition the U-Thong National Museum.

1.5.2.2 The audience who visited during the prototype exhibition on 7-25, November, 2012, such as students, teachers, professors, archeological and historical scholars, local executives and tourists.

1.5.2.3 The museum administrators, museum academics, and experts of design and exhibition in the museum, who visited during the prototype exhibition on 7-25, November, 2012.
1.5.3 Scope of design

1.5.3.1 To experiment with techniques and interactive media exhibited with artifacts.

1.5.3.2 To design interactive media contents to revitalize the exhibition in a case study of U-Thong National Museum.

1.5.3.3 To determine the exhibition scope under the limitations of the conventional site, content, atmosphere and environment of the museum.

1.5.3.4 To exhibit prototype model at U-Thong National Museum.

1.6 Framework for the Research

This research was aimed to study, analysis and experimental development\(^7\) of using interactive media technology exhibited with antiques and art objects for museum artifact collections in a case study of U-Thong National Museum. The researcher studied on site, content, information and history of artifacts, along with techniques and patterns for the exhibition through studying other domestic and overseas museums. Then the tool for study was built in the form of interviews with experts and questionnaires to visitors who visited the U-Thong National Museum in order to analyze the prototype exhibition for the conceptual model. Afterwards, the researcher arranged the works of the model exhibition within the conventional site of the U-Thong National Museum, which audiences visited, after the researcher had built it according to the determined framework. This prototype exhibition was used for collecting information, perceptions, and experiences of visitors through interviews, analysis, and criticism from experts of the results obtained from the visitor questionnaires. The researcher then gathered information from the beginning of the study along with the results of satisfaction and experience of audiences towards the prototype exhibition, and developed a concluding model used for museum artifact collections in the future.

\(^7\)It was a systematical study and applied existing knowledge from the research or experiences of new inventions to build new processes, systems, and service including improving inventions or establishments. See Thai all, *Meaning of Research*, accessed March 4, 2013, available from http://www.thaiall.com/research/whatisresearch.htm.
1.7 Preliminary Agreement

1.7.1 The researcher studied the U-Thong National Museum and domestic museums and overseas archeological and historical museums.

1.7.2 The research for building the prototype exhibition model with the case study of U-Thong National Museum was to find the alternative approach for museum artifact collections to exhibit antiques and art objects.

1.7.3 The questionnaire the researcher constructed via analysis and examination from experts was to study the exhibition on the site of the U-Thong National Museum and satisfaction towards the prototype exhibition model.

1.7.4 The respondents of the questionnaire that the researcher constructed had to be audiences who visited the prototype exhibition model that had been arranged in the U-Thong National Museum.

1.7.5 The objective of this research was to propose the alternative approach using interactive media technology for museum artifact collections for revitalizing exhibitions in terms of new experiences, perceptions, learning, emotions and memories in the future.
1.8 Research Methodology and Process of Study

This was descriptive research and experimental development research according to the experimental process and design creation by studying documents, collecting information, and analyzing the conventional exhibition and environment of the museum to enhance the interest of public and new experiences for visitors. The researcher conducted the process according to the methodology and process of study as shown in diagram 1 according to the following overview:

1.8.1 Problem definition: Exhibitions in museum artifact collections focused on providing knowledge of content. However, there was still a lack of interest and lack of linkage between artifacts and audiences as well as a lack of participation of visitors. Therefore, the researcher proposed an alternative presenting by using interactive media technology.
1.8.2 Literature review and fieldwork survey

1.8.2.1 To study information, contents, theories, management principles and exhibitions in the museum by the following methods:

1.8.2.1.1 To study and collect information from many document sources.

1.8.2.1.2 To visit and survey the exhibition site of the museum under diverse dimensions.

1.8.2.1.3 To collect preliminary information by making inquiries of related officers and visitors in the museum.

1.8.2.1.4 To observe the museum in order to collect information.

1.8.2.2 To study information, contents, theories and design of the interactive media technology by using the following methods:

1.8.2.2.1 To collect information of the interactive media technology from many document sources.

1.8.2.2.2 To survey the exhibition site of the museum by using the interactive media.

1.8.2.2.3 To collect preliminary information by making inquiries of related officers and visitors in the museum.

1.8.2.2.4 To observe the museum in order to collect information.

1.8.2.3 To study the related research, articles, books and documents.

1.8.3 The experimental interactive media techniques and investigated the working process of basic techniques to apply for alternative designs in the future.

1.8.4 The experimental workshop was conducted to create art works by using techniques from the study and present contents with objects. Visitors participated with contents and linkage between contents and objects was provided by the interactive media technology.
1.8.5 The experimental analysis was conducted from the Media Organic with is experimental project represent between interactive media technology and art objects. This analysis was to examine perceptions by conclusions from the experimental result of the art works along with the document study and experiment of no. 8.3. Then, the analysis was conducted to integrate using interactive media technology with the artifacts exhibition. The appropriate area was analyzed to build the conceptual model using interactive media technology for the experiment as a case study in the future.

1.8.6 The conceptual model proposal was to integrate the interactive media technology with the exhibition of artifacts in order to build liveliness and new experiences as well as visitor participation. The researcher used knowledge from no. 1.8.1 to no. 1.8.5 to conclude the framework as the model for exhibitions in museum artifact collections in the future.

1.8.7 The fieldwork case study was conducted at the U-Thong National Museum:

1.8.7.1 To study information of the U-Thong National Museum. The researcher studied all the information of the museum to thoroughly select the study room. The researcher selected the U-Thong Sri Dvaravati exhibition room as the design study room.

1.8.7.2 To construct the questionnaire in order to study the information of the U-Thong Sri Dvaravati exhibition room.

1.8.7.2.1 General nature of visitors.
1.8.7.2.2 Overall opinions of visitors towards the U-Thong Sri Dvaravati exhibition room.
1.8.7.2.3 Satisfaction of visitors towards each area of the artifacts exhibition in the U-Thong Sri Dvaravati exhibition room.
1.8.7.2.4 Suggestions of visitors for the U-Thong Sri Dvaravati exhibition room.

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1.8.8 Analysis and evaluation which analyze the study room and draw conclusions from the results of the questionnaire, was conducted to supplement the framework for building the model as the research tool from conclusion no. 1.8.7.

1.8.9 Conceptual analysis was conducted to analyze the framework for building the model as the pattern of the exhibition. The researcher used knowledge from no. 1.1 to no. 1.8 to find the framework experimental model as the pattern of the exhibition, “The Replay: U-Thong Sri Dvaravati”.

1.8.9.1 To analyze the contents of the conventional exhibited in the U-Thong Sri Dvaravati room.

1.8.9.2 To analyze the framework of presentation.

1.8.9.3 To analyze the interactive media technology to be suitable for the contents.

1.8.9.4 To analyze the exhibition site and environment.

1.8.9.5 To analyze the building of experiences and emotions.

1.8.10 Fieldwork and an experimental workshop which are experiment techniques and contents in the conventional site and environment were conducted for the “The Replay: U-Thong Sri Dvaravati” exhibition.

1.8.10.1 To design contents to be used for the prototype exhibition in U-Thong Sri Dvaravati exhibition room.

1.8.10.2 To experiment with techniques and contents in the exhibition site and environment in the U-Thong Sri Dvaravati exhibition room to assess the appropriateness of the techniques and installment after taking the framework of building the prototype exhibition: “The Replay: U-Thong Sri Dvaravati”.

1.8.11 Installation the prototype exhibition was conducted to prepare equipment, tools and survey for the following installment:

1.8.11.1 To prepare the team, contents, equipment and tools.

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Tricia Austin & Richard Doust stated that a prototype is a first version of a design solution built to exact technical specifications so that it can be tested. This is an extremely important stage for software development and usability testing of graphic and interface design. See Tricia Austin & Richard Doust, New Media Design (London: Laurence King Publishing, 2007), 76.
1.8.11.2 To prepare the site of the prototype exhibition room at the U-Thong Sri Dvaravati exhibition room.

1.8.11.3 To install the works and experiment with the real application.

1.8.11.4 To prepare the team and solution plan for unexpected case.

1.8.12 The exhibition showcase “The Replay: U-Thong Sri Dvaravati” at the U-Thong National Museum and collect the following information:

1.8.12.1 To collect information of the exhibition by using the questionnaire to study the following information:

1.8.12.1.1 General nature of visitors.

1.8.12.1.2 Overview of the opinions of visitors towards the prototype exhibition.

1.8.12.1.3 Satisfaction with each area of the prototype exhibition.

1.8.12.1.4 Suggestions of visitors.

1.8.12.2 To collect information about the exhibition by using interviews to study the following information:

1.8.12.2.1 General nature of visitors who provided the interview.

1.8.12.2.2 To study whether perceptions and knowledge increase when using interactive media technology for presentation in each area.

1.8.12.2.3 To study whether the atmosphere within the exhibition room and the presentation creates or reduces value when integrating the interactive media technology with artifacts.

1.8.12.2.4 To study the method of communicating contents, meanings, perceptions and emotions of visitors to each exhibition area.

1.8.12.2.5 Techniques used in each area were suitable for contents and artifacts.

1.8.12.2.6 Appropriateness of the exhibition pattern by using interactive media technology with the exhibition of artifacts.

1.8.12.2.7 Possibility to attract Thais’ interest and an increase in the number of visits to the National Museum or other Thai museums.
1.8.12.2.8 Possibility to use the framework of interactive media technology with the exhibition in the museum to supplement other museums in the future.

1.8.13 Exhibition analysis was conducted to find knowledge and suggestions from the study through the exhibition prototype model by analyzing the questionnaire, interview and observation.

1.8.14 The conceptual model conclusion was derived by analyzing knowledge from the study process “The Replay: U-Thong Sri Dvaravati” exhibition. The analysis resulted in the conclusion of the design for the framework of the exhibition by integrating the interactive media technology with the exhibition of artifacts in museums in the future.

1.8.15 Thesis conclusion was developed by concluding the design process, the research result and new knowledge of this thesis. The issues were concluded in writing the article for the national and international academic conferences and through the article publication in journals.

1.9 Research Outcome

This research proposed the framework for designing the proper interactive media towards museum artifact collections which exhibit ancient objects and art objects. In addition, the model was discovered to create new experiences in the traditional exhibition from the design study of the U-Thong National Museum. The framework from using interactive media model in the museum could be used to motivate the interest of audiences. It also concluded the experimental development and creation as the alternative for museum artifact collections which exhibit arts and antiques in order to add atmosphere and new experiences for audiences.

1.10 Chapter Summary

This research focused is relationship between three core components. According to Professor Dr. Mustaffa Halabi Azahari suggest that “A model of theory of communication”,¹⁰ as shown in diagram 2 which the museum artifact collections (Source), audiences (Receiver) and media (Medium or Tool). This research try to find

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¹⁰ Interview with Mustaffa Halabi Azahari, Dean, Faculty of Art and Design, Universiti Teknologi MARA (UiTM), Malaysia, December 15, 2014.
out is impact to audiences by focused on the experimental prototype by using interactive media technology to build new experiences for audiences in terms of artifacts. The researcher applied different methods derived from current technology and used them to evaluate participation levels in the prototype exhibition at U-Thong National Museum among medium, artifacts and audiences.

Diagram 2 Model of theory of communication

This experiment emphasized practice on the site and environment through many possible techniques and methods used. The selection principle was suitable for contents, artifacts, areas and audiences. Construction of the model was the focus in collecting information from the experiment and the model was used for audiences. Furthermore, the experiment was conducted to draw conclusions regarding the model to be the alternative for integrating the interactive media technology with the exhibition of artifacts in order to build experiences, perceptions, learning, emotions and memories in museums in the future.
Chapter 2
Literature Review and related studies

2.1 Introduction to Museum

2.1.1 Significance and importance of Museums

Museums in Thailand have been established for people ever since the reign of King Rama V, and they have been evolving from the past until the present. In the past, they were established to maintain ancient objects and historical evidence. Later, they were tasked with duties to provide knowledge to public. A “Museum” is a service and non-profit institution, permanently established to help the public to develop society. Its duties are: seeking, collecting, conserving, researching and exhibiting objects as evidence of humans, and to be an environment for learning, studying, and enjoyment. Thus, according to George E. Hein stated that museums are extraordinary places where visitors have an incredible range of experiences. Moreover, the officers of a museum have to study objectives until they are clearly understood and linked with social context relating to ancient objects. First, the museum could be used as a place of contents of knowledge, and this was their first priority for operation. Second, educational concepts have to be considered, and, finally, searching strategies must be implemented, in order to integrate knowledge and educational concepts for providing the proper patterns for the future.

The concept for providing knowledge by museums has a role to play, and has been continually developed. In 2006, museums started to provide online visits on the internet, and visitors had the choice to visit the website as it was more convenient than visiting a real place. However, it was found that visiting the real place was more important than visiting the internet, because visitors who visited the real place

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3 Suthi Ananwilat, “Design within the contemporary art museum by using the concept of universe earth in Trai Bhumikatha” (Thesis of the master’s degree, Interior Design, Decorative Arts, Silapakorn University, 2007), 43.
could touch a real atmosphere, objects an antiques, to get a flavor of the visit. Then, the museums started to find strategies and incentives for visiting the museum, and to build mental consciousness among youths. A researcher considered an important issue of the museum, in that “the museum was a real knowledge resource center and it had correct information. Its duties would maintain antiques and found knowledge at the time, and provide knowledge to the public as much as possible with different presentations and communication according to the appropriateness of contexts of contents and objects exhibited in the museum.” Contents, duties and objectives of the museum resulted in classifications of museum, to easily arrange contents and knowledge and communicate them as correct history, backgrounds of antiques and arts, as well as they should be suitable for people.

Diagram 3 Summary of Types of Museum from the Manual of Local Museums by Somluk Charoenpot

4 Nitas Chitsopon, “How to make object-based museums more interactive” (Document of workshop conclusion lectured by Jone C. Kawan at Kingkanya Room, Four Wing Hotel, Bangkok, May 20, 2006).
2.1.2 Types of Museum

The museum in Thailand has been continually established. Contents and patterns of exhibition have been as diverse as the ages. Management, atmosphere, and location impacted classifications of museum to facilitate study and supplement knowledge, resulting in the classification of museums. The tasks and objectives of museum establishments were probably different, and similarities of concepts were amidst different diversities. Thus, according to Somluck Charoenpot, the classification was clearly done by dividing into two types, as shown in Diagram 3.

The first was classifying as management, such as: the National Museum (Figure 1), the Local Museum (Figure 2), the Museum of the Agency (Figure 3), and the Museum of the Private sector (Figure 4). The second was classifying as types of collected objects or contents, such as: the General Museum (Figure 5), archeology (Figure 6), The History Museum (Figure 7), The Art and History Museum (Figure 8), The Anthropology/ Ethnology/ Folk Museum (Figure 9), The Modern/ Contemporary Art Museum (Figure 10), The Specific Stories Museum (Figure 11-12) and etc. Thus, all branches and professions could establish a museum.

Type of museums classified as management

![Photo of the National Museum](Photo by Atithep Chaetnalao, on site studied at Mahaviravong National Museum on May 16, 2009)


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Figure 2 Wat Mahachai Northeast Museum

Figure 3 Museum of National Treasure, The Pavilion of Regalia, Royal Decorations and Coins

Figure 4 Thai Bank Museum
Type of museums classified as collected objects or contents management

<table>
<thead>
<tr>
<th>General Museum</th>
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</thead>
<tbody>
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<td><img src="image2.jpg" alt="Image" /></td>
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<td><img src="image3.jpg" alt="Image" /></td>
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</tbody>
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Figure 5 Children Museum, Bangkok
(Photo by Atithep Chaetnalao, on site studied at Children Museum, Bangkok on December 8, 2009)

<table>
<thead>
<tr>
<th>Archeology Museum</th>
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<td><img src="image5.jpg" alt="Image" /></td>
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<td><img src="image6.jpg" alt="Image" /></td>
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Figure 6 Bang Wang Had Archeology Museum

<table>
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<th>History Museum</th>
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<td><img src="image8.jpg" alt="Image" /></td>
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<td><img src="image9.jpg" alt="Image" /></td>
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Figure 7 Mueng Tha Thong History Museum, Wat Kao Phra Nim
Art and History Museum

Figure 8 Ban Nang Tha Lung Suchat Subin Museum

Anthropology/Ethnology Folk

Figure 9 Cultural Anthropology Museum, Institute of Language and Culture for Rural Development

Modern/Contemporary

Figure 10 Museum of Contemporary Art (MOCA)
Specific Stories

Figure 11 Bangkok Seashell Museum

Figure 12 Thai Human Imagery Museum (Nakornpathom)

Diagram 4 Summary of Museums classified as types of media for the Exhibition by Researcher
However, types of museum were probably classified within others, as museum specialists and scholars determined. A researcher could conclude the classification of museums as a media of exhibition (Diagram 4).

First, it was non-interactive media as figure 13, because no mutual interaction media technology was used for the exhibition. This type emphasized providing information to visitors directly, such as: antique showcases, graphic boards, object models, human models, and event models. Second, it was interactive media as figure 14, by using mutual interaction media technology completely and focusing on participation of visitors with the exhibition or new experiences, such as interactive software presentations, computer games and interactive installations. Third, it was mixed media as figure 15. Many kinds of media were mixed, called multimedia. It integrated non-interactive media with interactive media. However, the amounts of this type of museum are quite small, and the nature of exhibitions are integrated patterns, antique showcases, graphic boards, models, video media, interaction media, and the participation of visitors in some areas of the exhibition.

Type of museums classified as types of media for the exhibition.

<table>
<thead>
<tr>
<th>Non Interactive Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 13 Ban Kao National Museum</td>
</tr>
</tbody>
</table>

(Photo by Atithee Chaetnalao, on site studied at Ban Kao National Museum on November 19, 2010)
Figure 14 National Museum

Figure 15 Learning Museum
(Photo by Atithep Chaetnalao, on site studied at Museum Siam, Bangkok, on March 29, 2010)

Diagram 5 The different type of media in each of the exhibits in the museum
Differences had been made clear for the museum specialists to determine the type, roles, and contents of the exhibition and its impact on visitors as shown in Diagram 5. Some small museums, like the local museums, had to be close down due to the decrease of visitors, until they were finally deserted because of negligence from Thai visitors. However, newly opened museums could be proved by easily arranged contents and obviously regarding duties of communication, including that visitor could select what they were interested in.

2.1.3 Thai National Museums

2.1.3.1 Histories and Background

Thai National Museums have a long history and long history of development. They started from museums in the palaces and then private museums. In the reign of King Rama IV, it was the first time that a private museum was established at Ratcharuedi Palace for private viewing. It was regarded to have the museum arrangement of the Kingdom of Thailand, to respond to royal strategies demonstrating civilization in the country, and so that foreigners knew about the resistance of imperialism. King Rama IV’s interest in antiques, historical and archeological knowledge, throughout traditions and customs, were widespread.

In the reign of King Rama V, he visited many countries in Asia and Europe, and he brought back a model of the museum arrangements to Thailand, such as Concordia Tower. He was also kind with regards to the museum tasks supervised by the King’s Guard Regiment. Later, on the occasion of celebrating the King’s 21st birthday, on 19 September, 1874, it was the first time people were allowed to visit the museum, and this date was regarded as the origin of the first national museum of the Kingdom of Thailand. In 1875, an exhibition in the museum following international standards was arranged. Antiques were divided into three groups:

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6 Or the Sahathai Samakom Pavilion, at present. In the past, it was called the Museum Building. See Nakkanok, *Old Story of Museums* (Bangkok: Sangdao, 2012), 8.

7 The meeting and the cabinet had the adoption to determine the 19th September of every year, since 1995 was the Thai Museum Date. See Ibid., 10.
types: 1) Thai art objects and antiques, 2) Royal articles of use and royal utensils, and
3) Art objects from overseas.\(^8\)

In the reign of King Rama VI, he had the royal command to appoint ‘the library committee for Pranakorn’, on 17 January 1923, to be responsible for surveying and maintaining antiques and ancient remains for archeological advantages. This section would protect the taking of antiques from the museum because they later became the origin of the archeological and art museum.\(^9\) Afterwards, he laid the foundations by allowing the Royal Academy to be the committee to take care of museum tasks, for the purpose of being further academics within the organization.\(^10\)

In the reign of King Rama VII, he had royal words to transfer the museum to be under the royal library of Pranakorn. However, on 15 March 1926, he had royal words to establish the museum for Pranakorn after 19 September, 1926. Thus, change to museum arrangements started after 1926. Somdet Krom Praya Damrong Rajanubhab and Prof. George Coedes improved the exhibition. They changed the pattern from a general museum to a museum that collected and preserved art objects and antiques.

The government issued an Act about sending art objects and antiques overseas. They first had to be approved by the Royal Academy. King Rama VII proceeded to open ‘The museum for Pranakorn’ on the royal ceremony date of his birthday - 10 November, 1926.\(^11\) Later, at the end of his reign, many political incidents happened, and the story of the museum was neglected.

In the reign of King Rama VIII, he allowed the museum of Pranakorn to be restored, and he was kind enough to enact the ‘Ancient Remains,

\(^9\) Ibid.
\(^11\) National Museum, The Fine Art Department, Ministry of Culture, History and Background of the National Museum.
Antiques, Art Objects and the National Museum Act B.E. 2477’, on 7 May, 1935. He then assigned the responsibility to the ‘Fine Art Department’, the Ministry of Thammathikarn, which has been changed to the ‘Ministry of Education’ at present.

Nowadays King Rama IX is interested in museum arrangements. The national museum is flourishing more so than in the past. It is greatly modern, and visitors are interested in studying and searching for knowledge. Furthermore, the King focused on art and culture of the country no less than other fields. Several times he asked all parties to jointly maintain them for the next generation. The King spoke many times regarding the national museum, in that it provided his remarks to the Fine Art Department and they had to find the methods to respond to the King’s words, and to gain benefits towards national museum tasks.  

2.1.3.2 Significance and Importance of Thai National Museums

Visitors or people in general probably thought that no movement was occurring concerning the National Museum. In fact, all aspects of the National Museum itself had working knowledge hidden all the times. It concluded in front stage and back stage working, because tasks in the museum were diverse. They were collecting and providing information or services, developing activities, such as: conservation, research support, knowledge, study and interpretation, exhibitions and public relations for society to value awareness. The above responsibilities could be classified as follows: 1) Collecting, 2) Identifying, Classifying and Research, 3) Recording, 4) Conservation and Preservation, 5) Museum Security, 6) Exhibitions, 7) Museum Education, and 8) Social Functions.

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12 Nakkanok, Old Story of Museum, 82-93.
14 Waralat Boonyasurat, “Museum, Role, and Management” (Documents for the subject of Art and Cultural Management, Thai Art, Faculty of Fine Arts, Chiang Mai University), 15-18.
Therefore, the national museum is important for education as much as a school, because it is a knowledge source which serves all people or a person who is not in the education system, or general people.\textsuperscript{15}

2.1.3.3 Problems and Changes in Current Thai National Museums

With regards to the movement of current museum tasks, the museum seriously supports education for people in the 20\textsuperscript{th} century. It had movement and development under the influence of society and education, until it truly became the center of the community and educational institutions. Current modern museums respond to the requirements of people according to the objectives of the museum, and provide them with knowledge and enjoyment. The important components resulting in changes to the museum cycle are modern techniques used in exhibitions in the museum, due to improvements to education. From the beginning of the 20\textsuperscript{th} century, education has been greatly changed and developed, especially in the U.S.A. People have been awakened to progressive education since the 1920s, resulting in the chance of museum cycles.\textsuperscript{16}

In 2005 AD, presentations of the museum have been in good image, in terms of the value of local and regional civilizations. However, the patterns of presentation have not been interesting, difficult to understand, contain only specific information for some groups, and there has been no continuous improvement. This resulted from the period and an increase in the requirements of visitors.\textsuperscript{17}

In 2009, Mr. Thira Salukphet, the Minister of the Ministry of Culture stated that, “At present, children, youth, throughout people are not interested in visiting the museum and local knowledge sources. They thought that its management was not interesting, old, and with poorly organized objects, until it seemed as a storage unit with nothing to attract visitors. Thus, the national museums


\textsuperscript{16}Waralat Boonyasurat, “Museum, Role, and Management,” (Documents for the subject of Art and Cultural Management, Thai Art, Faculty of Fine Arts, Chiang Mai University, n.d.), 11.

\textsuperscript{17}Somluck Charoenpot, \textit{The Strategy Plan of the National Museum Development}, 29.
in the whole country should be solving all problems that the Ministry of Culture monitors, in order to urgently solve such problems.”

Nowadays, the museum further focuses on youth, so the museum was established to provide them with direct benefits, such as the Children’s Museum. General museums were awakened to improve their business and services for the youth, who were overlooked for a long time. Hence, museums tried to improve both the exhibitions and activities concerning educational advantages for all people.

2.1.3.4 Summary

Pertaining to the history and background of Thai museums, they were only perceived as a place to collect art objects and antiques, started by a Royal idea or King Rama IV. At present, evaluations of museums have been developed, because of foreign influences and the values of Thai people. Requirements of the Thai people for studying information widened towards arts, so the national museums exhibited antiques showcases.

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The content presentation using books or descriptions was changed to reduce tedium and stillness of atmosphere in the museums, by allowing visitors to participate with modern technology. This included building new contents, or combining old and new contents. For example, the Suphanburi National Museum (Figures 16) started to use interactive media for some parts of its exhibitions. With regards to its development, besides the change to visitors’ current requirements, the Ministry of Culture focused on conservation of art and cultural heritage, and providing knowledge to visitors. These were the main tasks of the Fine Art Department. The Office of the National Museum had to develop the national museum into becoming a body of main knowledge sources of the government, which provides knowledge in all fields to the people.20

Thus, national museums had to be developed for learning, and personnel and management were required to develop such. However, the main factor of changes concerning the museum cycle was exhibitions in the museum, and

not only the use of modern technology but also the presentation, which focused on visitor participation, simple contents, and enjoyment that results in perceptions, learning, and feeling together; much easier than presenting original information from the past until the present.

For this reason, museums developed media used in exhibitions more. During phase one, such media took part in the exhibition and later developed into the use of interactive media to exhibit more, because of the need to provide a more modern, efficient, accommodating presentation to the audience. Moreover, it can also make learning be fun and enjoyable for the audience to enjoy the lifestyle of the people in today’s society.

2.1.4 Museums and Thai People

Nowadays, Thai museums use a variety of media for exhibitions. Many museums use interactive media, such as: Siam Museum (Figures 17) located at Sanamchai, Phraborommaratchawong, and Bangkok, Rattanakosin Exhibition (Figures 18) located at Ratchadamnoenklao, Bangkok or Dragon Descendants Museum (Figures 19), Amphoe Muang, Suphanburi Province. These museums interest students and their families, because the museums can build interest from the media and the amount of Thai and foreign visitors has increased. While some historical museums, e.g. the Ban Wang Had Archeology Museum\(^{21}\) (Figure 20) in Sukhothai Province, have been forgotten by Thai people, they are still important, because antique evidences were discovered in the prehistoric period. This museum is beneficial for scholars, people and students to seek knowledge and realize jealousy in national properties. However, it was very disappointing because the Fine Art Department only held training about the antique registrations for local people, at the beginning.

\(^{21}\)Antiques excavated in the area of Ban Wang Had, such as: a human skeleton, gold earrings in a tomb, appliances, beads, cruse throughout weapons made from metal were found. See The Cultural Information Center, Ban Wang Had Archeology Museum, accessed April 2, 2012, available from http://www.m-culture.in.th/album/169108
Figure (17) Siam Museum
(Photo by Atithep Chaetnalao, on site studied at Siam Museum on March 29, 2010)

Figure (18) Rattanakosin Exhibition Hall
(Photo by Atithep Chaetnalao, on site studied at Rattanakosin Exhibition Hall on March 21, 2010)

Figure (19) Dragon Descendants Museum
(Photo by Atithep Chaetnalao, on site studied at Rattanakosin Exhibition Hall on June 26, 2010)

Figure (20) Ban Wang Had Archeology Museum

Thus, management would be properly operated by a committee of the community and local administration. This happened to museums in many areas in Thailand. Although the museum demonstrated worthy contents, Thai people would ignore the exhibition if it was not interesting. It concluded with the museum exhibition of the Fine Art Department with the original style resulting in most people being bored, and feeling that the museum was backward. 22 As a result, Thai scholars tried to solve this problem by arranging discussions, such as an academic discussion of “Thai Museum: Potential to be Applicable.” (Figure 21) The essence concluded that the museums operated by the government were not quite as disappointing, because they still could respond to overall needs of society. However, current society requires further knowledge, because the government museums are still backward, in terms of being a non-formal learning source for society, and their development is unclear. If arranging an exhibition to respond to Thai people’s tastes, the museum probably has to arrange a room that could be changed for various exhibitions. Furthermore, the exhibitions in Thai museums should focus on glorification of social values and Thai culture to be manifested. The issue should be glorified and diverse for the people of Thailand, because they could peacefully stay

22 The Fine Art Department arranged only a trite pattern, so most people were bored. From the article, it mentioned the problem of the museum and referred to Sujit Wongted in 2004, but it did not refer to other sources.
together among a diversity of religions and this was a miracle of the aesthetics of Thailand.\textsuperscript{23}

However, the discussion to develop Thai museums was overlooked, and the result was not quite good enough, because Thai people would be excited only when a new museum was established. Afterwards, the popularity of visitors reduced, and Thai visitors would find other museums. Thus, it could be said that Thai people’s behavior to visit the museum was only for popularity. Therefore, the museum which exhibited antiques or ancient artifacts had only archeologists, conservationists, professors, or students visit to complete their reports. To avoid this problem, a new pattern of the museum was established using modern media. For example, multimedia or interactive media played an important role to present contents or the exhibition. However, many museums lacked capital and good management. Sometimes, the laws of Thailand had many rules or prohibitions, so these museums were increasingly neglected. Finally, the works exhibited had probably devalued as well.

2.1.5 Summary

The museum is a knowledge source, and it has duties to be linked with other agencies, such as government sectors, local areas, and educational institutions. In addition, the museum has to gather art objects and ancient sites to provide knowledge in education, depending on the type of museum. At present, the classification is obviously classified for both the principles of management and the types of exhibited objects. However, each museum has not clearly classified knowledge about the museum among the needs of visiting groups, such as: tourists, scholars, experts, children and students.

Visitors currently visit museums for enjoyment and to seek knowledge, information and recreation. As a result, the museum has to change its role to support the requirements of current people until it wins over the competition in the field of battle, and maintains a pattern of the original contents.\textsuperscript{24} Therefore, a

\textsuperscript{23} Siam Society Under Royal Patronage, “Thai Museum: Potential to be Applicable” 9, 15.

\textsuperscript{24} The museum has to support the requirements of current people until it overcomes competition in the field of battle. Such an article mentioned the problem of the museum and referred Kramer and Newsom (1975), but it did not provide other references.
selecting proper media for an exhibition and visitor behavior are very significant. Most visitors come mainly in groups, and only 5-20% of all individuals visit the museum. Grouping supports easy learning, due to the differences in educational background, learning patterns, and personal experiences. Exchanging opinions during a visit could widen the aspects of each person as they further perceive new things. Thus, the museum should prepare media or activities for group visitors, to support participating in the activities and gaining efficient learning.  

2.2 Media in Museums

2.2.1 Significance and Importance of Media

In general, media refers to a sender conveying contents from a source of communication. They are probably humans or non-living things sending contents to a receiver. In the case of schooling, this is a learner. Media is a mediator between the source of contents and the receiver. It conveys contents from the source to a receiver for the purposes of communication. According to Michelle Henning the exhibition promised to establish an unprecedented interactive relationship between media and audience. Comparing the meaning of media in a museum or exhibition means elements of the exhibition of the museum are formed to explain contents, stories and incidents, to completely make the exhibition an efficient form of communication. The contents and main idea of the story could be conveyed to visitors. The process of providing knowledge could be properly done. The sender was an officer of the museum, and the receiver was a visitor. The contents were art objects and antiques. Media were objects used to make visitors


understand, perceive and appreciate art objects and antiques. The important media were labels, photos, charts and maps.

At present, the modern media are: light, color, sound, touch, smell and taste. Using these media depends on the contents of the exhibition, to respond to different requirements and interests of visitors, and the purpose of the museum. However, media resulted in different learning, and some media were limited by visitor perceptions.

Elders or people who was not good at learning new media such, as computers, were not interested in this type of media, or could not access information through it. On the other hand, the computer media attracted teenagers and adults. Thus, media in the museum should be built for a variety of visitors, and it should also support the disabled. For instance, one antique could be studied from reading, listening, or a finger language screen, depending on the museum’s management. However, media should result in many aspects of learning, and correct learning as much as possible.

2.2.2 Types of Media in the Museum

As analyzing and summarizing types of media from a leading design company and using media for the exhibition, a researcher could classify the type according to the media for exhibition in the museum (Diagram 6).

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Diagram 6  Types of Media for an Exhibition in a Museum

Figure 22 Singapore Art Museum
(Photo by Nichakan Chaiyajuk, on site studied at Singapore Art Museum on April 27, 2012)

2.2.2.1 Non Digital Media is one way media. It directly provides information to visitors; for example, Singapore Art Museum (Figure 22). They are receivers, and cannot respond to it or search for in-depth information, including it is permanent and unchangeable information, as follows:

a. Graphic boards such as labels, a variety of boards, such as Graphic Board, Light box and Tri-Vision.

b. The model could be divided into two types. First, it was the model or statue of objects or humans, such as a wax model, building or place
models. Second, it was a diorama to make the model events, stories, or environment, condensed or enlarged models, replicas, life-size figures and diorama. The life-size figure could completely provide real details (1:1), and demonstrate immovable environments of humans or animals.

c. Settings of 3D atmosphere and environment as a real ratio. The purpose was visitors could feel life figures or places, according to the contents in the exhibition. The recreation setting was completely similar to a real one but visitors could feel it. The theatrical environment was supposed and only happened in an imaginary world. The restoration settings of existing architectural building were moved to reassemble or remodel them, by focusing on the complete life figure.

2.2.2.2 Digital media is one way and two way exhibition media. It could provide information for various visitors; for example, the National Museum of Singapore (Figure 23), in which there could be only receivers or it could build interaction with them. They could search for in-depth information according to their requirements, and the information could be easily changed or updated.

a. VDO presentations demonstrated motion and slides, with narration and songs by DVD on screens of a television, a projector, or an electronic board.

b. Interactive software was media interaction with visitors, or with which they could participate or gain new experiences. First, computer software
programs for seeking in-depth information or a computer game increasing knowledge were suitable for various visitors. Second, interactive shadow play was a presentation using modern technology and screening on a large screen. Visitors could move their bodies to see their shadow on a detector and the program would work.

c. Hands-on or interpreters was the media visitors could participate in with an activity and they could touch it for self-learning by joining the activity or interacting with the media prepared in the exhibition.

Figure 24 Mighty Eighth Air Force Museum, Georgia, U.S.A.,
(Photo by Atithep Chaetnalao, on site studied at Mighty Eighth Air Force Museum on October 13, 2011)

2.2.2.3 Mixed media was exhibition media using many types of media, called multimedia; for example, the Mighty Eighth Air Force Museum, which is one of the World’s Most Powerful Museum Experiences (Figure 24), as follows:

a. Ghost effect or hologram was the mixture of non-digital or digital media such as integration, or VDO presentation with models by reflection technology. It resulted in life figures on VDO presentations, until it seemed a real event happened to the model. In addition, it used light effects and a control system which was similar to one of light and sound types.

b. Two layer techniques could integrate a variety of media, such as graphics media integrated with VDO presentations, or graphics media integrated with models, by overlapping two media and obstructing with a scrim or a perforated inkjet. Light effect was installed in each layer, and a switch turning on-off the lights resulted in pictures with chronology changes, which was another interesting method of narration.
It could be considered that media was not just the material or object for narration or communication, but media could be other diverse patterns. It could be divided into two main types; concrete and abstract media. The concrete media was tangible and visible, such as signs with explanations, computers, papers, and models. This media was easy to use for evaluation of application.

The abstract media was tangible, and it motivated the senses of the multi-sensory system. The application was not difficult and could be used for all presentations, and it usually used taste, smell, vision and touch. It built additional atmosphere into the exhibition, to build realistic feelings, impressions, and good memory for visitors.

Moreover, it could form the patterns of activity which hid contents or knowledge. Each type of media was used too much, until it became repetitive and no longer interesting, so a new pattern of media was used. It not only provided contents but also it built interest and enjoyment, such as the interactive media. It was widely used in the events and the museums overseas.31

2.2.3 Media in Museums and Thai People

The museum had to realize arranging various types of media to be suitable for requirement levels of learning of different visitors. However, the most important thing is building media to cover requirements of all people or the majority. It could be probably done for narration or by selecting words using simple explanations, so that it was not too difficult for general people or children.

Building the standard of objects and sign arrangement for easy vision was one factor to further respond to diverse requirements of visitors.32 In addition, the museum should understand Thai people’s habits, in case the target group was general people. Phong Phawichit33 explained interesting issues of Thai people’s habits. For example, they love popularity and follow what is the new thing. They

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31Analyzing and concluding types of media from the additional information from the manual of local museums. See Somluck Charoenpot, Manual of Local Museums, 72.
33Phong Phawichit, X-RAY to Thai People 360 degrees, 3th edition (Bangkok: Than Book, 2007), no page.
would particularly focus on popular trends. Another one was what they require is not in doubt. Although they wondered, they quite did not ask or find an answer. On the contrary, they often claimed or criticized. Thus, the exhibition which could not clearly communicate was probably criticized in an incorrect way.

Furthermore, Thai people greatly respected sanctities and they often worshiped and vowed them. As a result, the important issue was the museum design relating to history, belief or religion. Selecting media should be paid more attention to, because it probably impacts on the feelings of visitors. Meanwhile, popular media should be used so that it could build much learning, perception and feeling, to be suitable for the exhibition as well. Hence, the researcher concluded the issues that museums should realize the use of media in the museum for Thai people, as follows:

a. Considering Thai people's habits meant that media application was suitable for Thai requirements. People and a period of ages in each area were different. They still had problems of knowledge basis, experience, less reading, and reading media. Therefore, if the exhibition mainly used reading as media, the interest of visitors reduced as well, because it was for a specific group who was interested in particular contents. As a result, some museums in Thailand should be improved to be suitable for Thai people's current habits.

b. Culture, belief, faith, and values impacted upon psychology. Feelings of Thai people could be positive or negative, because of related factors, such as different areas and habitation. Thus, careful communication should be considered, and these matters should be studied about local people before designing the exhibition media in the museum.

c. Perceptions of Thai people meant that some media could convey contents to some groups, because it had translation of perception and learning relating to humans. Some types of media used overseas could not convey meaning when used in Thai museums. In case Thai people visited the museum overseas with some questions about the exhibition, it was not the problem of language but it was differences in culture and learning about their daily life. Hence, all media from overseas could not be used in Thailand, because they could not build perceptions for all Thai people; thus wasting the budget due to high costs.
2.2.4 Thai people’s problems and media in the museum

As mentioned above about following popularity of Thai people, although they required an interesting and enjoyable media, appropriateness of contents should be realized as well. Sometimes, simplicity\textsuperscript{34} was important for the exhibition because clear letters and statements could help visitors understand contents. The significant purpose of the exhibition was building notions about stories, and using too much new media, material, and strange contents was not good; meaning perceptions would not conform to the purpose, cause wrong implications and negative aspects, especially selecting modern media and high technology for Thai people. If such media was new and complex, people were not familiar with it and it could probably be used for only some groups. On the other hand, another group feared or refused to use it, because Thai people still had differences about the technological approach. Thus, saving and simple clarity could build interest for some exhibitions as well.

\textsuperscript{34}Simplicity of the exhibition gained inspiration from the Academic Resource Center, Ubon Ratchathani University for the topic“Principles of Exhibition Arrangement”. See Worapot Nuansakul, “Application Munual of Graphic Art Media” (Documents for Operation, Educational Technology Department, the Academic Resource Center, Ubon Ratchathani University. It consisted of contents, knowledge, principles, and theories of the exhibition arragnement, 2008), 25.
2.2.5 Summary

It was well-known that the local museum or the government museum still lacked the budget for improvement and maintenance. Moreover, the local museums administrated by a private sector or a local agency were not looked at as seriously as the government sector. Therefore, solving these problems was quite difficult, since there was a shortage of budgets to thoroughly take care of intentions, and they have been gradually accumulated until present. It completely led to the digital age, and the private museums or the ones supported by the government with high budgets used modern media to build interesting presentations, and attracted visitors; such as, the learning museums of Museum Siam (Figure 25) and Rattanakosin Exhibition Hall (Figure 26). These museums arranged activities for the community and participants, including the continuing of activities resulting in popularity. It was common for Thai people to be interested in new museums at the beginning, and then the amount of visitors would decrease.

Therefore, the museum tried to arrange its activities by supporting visitors to have interaction with the museum and remain popular. Sometimes this method was operated too much, and the original contents to be communicated
were reduced. The museum specialists should find solutions or administration should, urgently. Furthermore, local or small museums should find adaptation to the proper context. In particular, the museum should focus on communication to conform to the purpose, by creating the contents more than thinking about the amount of visitors, throughout selecting interactive media technology for their exhibitions. Not only does this built interest for the visitors, but their learning, impressions, participation should be encouraged to create new experiences, perceptions and feelings, more than focus on enjoyment.

2.3 Communication in Museums

2.3.1 Significance and Purpose of Communication

Communication could be used for many cases, though its meaning was quite broad. It covered all processes that the mind of one person probably impacted the mind of another. Thus, communication not only referred to writing and speaking but it concluded music, pictures, plates, ballet, and all behaviors of humans, such as schooling in the classroom. In this case would mention communication in the museum is linked to the exhibition. For instance, one exhibition room exhibited the contents of ancient lifestyles in the U-Thong period. Many evidences of each antique and appliance had signs to explain their details. Some exhibitions were provided via earphones to listen to narrations. Things to communicate such contents were “media” and contents, and knowledge of antiques was the “message”. Hence, communication was the strategy that was the process to send messages to receivers for which visitors were to understand them as much as possible.

The purpose of communication was to accurately and clearly convey knowledge or messages. In case there is a problem in receiving messages, this would impact upon the sender to find further strategies of communication, and so

Meaning of communication from Warren W. Weaver. See Kwanchiwa Sangluang, “Concept Foundation and Sources of Communication Theories” (Schooling documents for Theories of Communication, Rajamangala University of Technology, Chakrabongse Bhuvanarth Campus, Bachelor of Technology and Public Relations, 2009), no. pag.
media was widely used. Thus, media had an important role to determine the suitable patterns of communication. However, communication sometimes was incorrect and improper, so perception was distorted or it was incorrect according to the purpose of communication through many factors, resulting in unsuccessful communication and the contents could not be conveyed as per its purpose.

2.3.2 Learning and Communication in Museums

The duty of the museum was the learning source, like the non-formal educational institute. Thus, visiting the museum seemed as entering a classroom with determined knowledge, according to the types of the museum and building contents by using media as a mediator between visitors and contents. Hence, media and communication were important to attract interest in learning. However, selecting media in the museum could follow the design principle for suitable communication and lead to complete and efficient learning, with the concept to build learning. When the objects exhibited had never been seen before, and they were difficult to understand using messages or too strange for visitors, they could not build a connection between themselves and the objects exhibited.

Therefore, learning could happen by making the unfamiliar become familiar using two methods. The first was building linkage between well-known objects with new things, which were contents of the exhibition. The second was narration which conveyed contents of well-known objects to become an interesting point of the exhibition. Visitors would be able to find a mutual point which had differences and similarities between common things and historical things. The museum should realize the significance of creating understanding and linking old and new things. However, the museum should understand that visitors had both different and similar personal experiences, knowledge basis, imagination, hope, and passion.

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36 The first method was using familiar things or objects in daily life to exhibit with historical objects to demonstrate utility in the same way, so that visitors could link with what they had never seen before. The second method was linking daily stories or activities of visitors with originality or daily stories of the past. See Kodchaporn Hatsadin, “National Museum for Complete Learning,” 67.
Diagram 7 The concept of learning by using a link between the audiences and artifacts.

The picture above shows the elements (Diagram 7) that can help learning, consisting of: 1) Well-Know Objects 2) New Things of Contents Exhibition 3) audience Experiences. All three of these can offer more learning to the audience and create a better link between male audiences with the objects exhibited. However, this requires a method to create the appropriate presentation as well.

With regards to differences in characteristics of individuals, Garder stated that the learning pattern of individuals could be divided into seven types, according to different occupations for easy understanding. They were: poets, musicians, math specialists, artists, workers, professors, and philosophers. Different characteristics required different stimulants for learning. Therefore, the museum should realize media preparation to respond to different requirements, aptitudes, and interests of visitors. In addition, to Kodchaporn stated that the museum should realize the importance of using media related to the five senses; image, taste, smell, sound, and touch. They could motivate efficient and notable learning, such as sounds of music and animals, smell, and touching different objects or surfaces.37

From the analysis and conclusion of some contents from the manual of display and exhibition, according to the theory of Thorndike, (Diagram 8) the researcher could conclude the factors relating to learning as follows:

a. Media for communication, clarity of media, outstanding light, color, sound, and size would attract interest. Originality and movable media could motivate interest throughout the state of applications to be had in general.

b. Visitors, attention, and propellant derived from motivation to participate in activities, emotions or mental state. If a person had good temper, he could translate meaning of touch more than he had bad temper, or his mind was hurt. Personal interest to participate in the activity or visit, difference of learners’ intelligence, and existing experiences of visitors impacted upon learning as well.

c. Environment, dimension distance of media, shallow and deep surfaces resulting in near or far distances could activate interest better than flat objects. Uniqueness of objects in a space or area would particularly build interest. The location and media installment should be in a suitable position and state of sound, atmosphere, or light in the exhibition area, and not be too light or dark.

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38 The Cooperative Technology Transfer Center 1 Pathum Thani Province, “The exhibition manual” (The documents of display and exhibition for people), n.d.
d. Tradition and culture, belief, faith, value, and life style impacted positive or negative feelings, thoughts, and consideration throughout life style could not build perception and understanding of meaning for experienced things, because it was new and it had never been seen or touched before in the original place. This concluded culture of attitude resulting in wrong learning or refusal.

2.3.3 Perceptions and Museum Evaluation

Perception and museum evaluation of visitors happened through antiques, design and presentation. The study of efficient and inefficient designed museums was concluded as follows:

In the museum where the exhibition was efficiently arranged and designed, the exhibited objects were used as media for presentation instead of message contents. Thus, this method was interesting and built originality. Visitors could greatly remember big objects and the ones that were difficult to find. An efficient design would be interesting, and built an impression from beautiful arrangements and selection of media for presentation in the exhibition, including activities visitors could participate in they enjoyed the contents under the exhibition pattern. However, the museum should realize too much media for presentation is not good.

Visitors realized the value of an inefficiently designed museum, where the arrangement of the exhibition antiques was more that the design and presentation. Antiques would be interesting and make impressions using media instead of message contents. Visitors focused on originality and objects, including the

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difficultly in discovering them. However, some groups did not think like that because the room was old, the exhibition was not suitable for the current era, lighting was not interesting, the letters was small and were be legible, and there was old and worn out equipment. Moreover, the pattern of the exhibition was not arranged as per the arrangement. Most antiques were set with original contents and some had too many details until visitors were bored and did not want to read them, so these antiques could not attracted them.

In conclusion, the efficiently designed museum tended to be able to implant visitors understanding the value of design in the museum. It could be said that the design could attract their interests, so that they further wanted to visit the museum. They could spend more time being interested in and remembering contents and the exhibition. Therefore, the government should focus on the exhibition design or displays in the museum, under the supervision of the government, more than they operate at the present, such as the Pranakorn National Museum and the National Museums in many provinces nationwide.  

2.3.4 Summary

As a result, the communication required experiences, learning, perceptions at a phenomenon level, and human perceptions could be analyzed by the perception theory for creative media, resulting in efficient perception. Perception is an important learning foundation of individuals. Responding to any behavior depended on perception from their environment and the ability to translate the meaning of such status. The factors of perception consisted of sense and mental factors; original knowledge, needs, and attitudes. Perception resulted from using the sensory motor of humans called sensory. They comprise five components: the eyes, ears, nose, tongue, and skin. The research shown in figure 27 found that the perceptions of humans are derived from vision (75%), auditory (13%), touch (6%), smell (3%), and taste (3%).  

42 Kantheera Sanguanthang, “Value Perception and Significance of Design Works through the Exhibition” 106.
From the theory of sensory motor, it demonstrated that most communication in the museum used pictures and sound. Later, current communication increased interest by touching and let visitors participate. Some areas of the exhibition used smell to motivate atmosphere. The four patterns of communication could be found in the modern museum, such as Rattanakosin Exhibition Hall. In addition, communication could impact upon learning from experience, in order to understand and think according to the steps of learning.
Learning was the process whereby visitors changed their behavior, as shown in Diagram 9. Thought of general people could be learnt from the auditory, touch, reading, and using technology. It consisted of three important foundations, as follows:

The 1st step was “experiences”. All normal people have sensory receptors known as the five senses: eyes, ears, nose, tongue, and skin. These senses are a gate for a person to perceive and respond to stimulus. Without these senses, a person could not perceive or have any different experiences. Some types were direct experiences, some were substituted, some were concrete, and some were abstract or symbolized.

The 2nd step was “understanding”. This involved interpretations or concepts of such experiences. This process happened in the brain or mind of a person. The brain would send perceptions and retain them, known as “understanding” in learning. A person would understand the experience he faced once he could organize, analyze, and synthesize experiences, until he could find the real meaning of such.

The 3rd step was “thinking”. Thinking was regarded as the last step of learning and it was a process happening in the brain. Accosting to Crow (1948) stated that efficient thinking should be able to organize and match original experiences with

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new experiences. Relationships between them could not be found, and it was the core of real learning integration.

One factor impacting upon the theory of perception was communication. It consisted of media, messages, a receiver and a sender. Thus, it could be said that incomplete elements impacted upon perception. For example, an antique exhibited was worn out and an organizer solved the problem by using a modern object. It was imitation and a model made to be similar to the original one. However, how he should focus on it depended upon meticulous craftsmanship in the modern era, because he could not make the model as equal as the original one. Another case was a sign to provide details of such antiques, which when fixed fell off. Therefore, this resulted in distorted perceptions or the analysis did not match the truth.

2.4 Experience and Phenomenology in Museums

2.4.1 Significance and importance

As a general meaning, human experiences are derived from touch between outside worlds with the senses: eyes, ears, nose, tongue, and touch. It faced the outside world or body. For instance, if eyes touch a picture; we call eye touch the eye experience. The meaning of experience according to the concept of John Dewey, the experience could be divided into two types: primary experience and secondary experience. The primary experience was an origin of the experience that still had no knowledge or reflective thought. It was only the process of action and change between organisms and the environment, such as touch, vision, and auditory. The secondary experience was knowledge. It passed through the reflective thought process, and the primary experience was the content which was basic information for reflective thought. For example, a visitor touched an antique made

45 Kirathi Boonchuea, General Philosophy (Bangkok: Thaiwatanapanich, 1979), 152.

46 John Dewey, an American famous philosopher of the world. There were many philosophies relating to education. See Prathom Anghruhohit, Philosophy of Pramatism, the philosophy foundation of education in democratic society (Bangkok: Chulalongkorn University Press, 2000), 84-93.
from rough stone, it caused a physical change. He felt hardness and roughness until he hurt his hand; this was the primary experience.

When a visitor had learned from touching an antique made from rough stone which could hurt his hand then he would not touch it anymore, or he would be more careful; this was the secondary experience from reflective thought or the cognitive experience. The philosophy of Dewey obviously reflected in education that focused on essential experiences for learning. Learning about real situations could benefit the body, intelligence, and virtue. Gained experiences would lead to adapting to the environment. Thus, the process of creating new experiences to link with old experiences had to occur in new experiences, for current and future knowledge.

Diagram 10 Structure of elements to emerge the experience in the museum.

2.4.2 Elements that provide experience in the Museum

The researcher analyzed and concluded them by classifying the elements of experience in the museum for learning, as shown in Diagram 10, as follows:
a. Original experience was the personal experience foundation of visitors. People who came from different backgrounds gained their knowledge, thinking, attitudes and lifestyle, throughout learning outside of the classroom before visiting the museum. When they saw the same object, a different aspect would be raised.

b. Direct experience was the most concrete experience. People have gained direct experience from real things, real situations, or their own actions, such as touch, vision, auditory, or smell.

c. Motivation was something that resulted in behavior or action. It depended upon motivation to drive a person to demonstrate his behavior according to his goals and achievements in the required target or condition. Many factors were probably used as a lure, punishment, and pride for wakefulness and expectations. It resulted in visitors wanting to participate in and access information caused from stimulus, in order to build interest in the visit.

d. Media was one element to support telling the story and contents for communication, such as: maps, charts, statistical charts, marks, sound recordings, radio, signs with explanation, telling the story by a VDO, slides, and imitations or life-like figures. The model or situation explained by sound, for clear understanding and images, was a sample of designed media.

e. A message was a meaningful story or things in the form of information, knowledge, thinking, needs, emotions, etc., that were conveyed to visitors. For example, the message herein was the contents of antiques used for the exhibition presented to visitors for acknowledgement and understanding. Some types of message were unsuitable for a receiver, due to being too easy or too difficult. Moreover, they lacked good order, and did not screen only the main contents, so

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visitors were bored. Messages or language were complex and obscure throughout using an original message, until it was too difficult for interpretation.  

Diagram 11 Learning steps according to the experience learning theory of Kolb  

2.4.3 Level of Experience and Learning in Museums

Vision, auditory, or touch led to an experience of learning for visitors. It could indicate success of communication and be a guideline to completely adapt communication. There were two levels of experience from learning in the museum:

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The first derived from linking new things with original knowledge. The second derived from learning from vision without previous knowledge. However, this level could lead to misunderstanding. Therefore, the original knowledge of visitors was a largely important factor that the museum should not overlook, because learning new things is very difficult and they rarely happen without linking to previous knowledge. Visitors who systematically learned new things for each step would support learning according to the experience learning theory of Kolb, as shown in Diagram 11. The first step was “concrete experience”. This step helped a learner to have experiences by focusing on feelings and real experiences. The second step was “reflective thinking”, in which a learner gained understanding about the meaning of the experience gained, with careful observation. The third step was the “conclusion”, as an abstract applying logic to the idea of the sum principles. The fourth step was real practice. A learner applied understanding from the third step to real practice whether or not it was correct, and this step focused on application.

Learning steps according to the experience learning theory of Kolb could link with the experience learning events as the following sample case. Visitors could touch the concrete experience from seeing a mural painting of the ‘Walking Buddha on the Bronze Footprint’, at Wat Sadejkhamphang (Figure 28, left). Visitors first noticed the nature of pictures, calmness, and appearance of the image of Buddha. Then, they read information from a sign, name, period (Sukhothai Art). They elaborately considered the picture and information with their reflective thinking, to conclude and notice details of the picture. It was a brief conclusion in the form of abstract thinking, according to the concept and analysis of visitors. (In this case, they could analyze the shape of the image of Buddha concerning the artistic

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54. The 1st step Concrete experience
55. The 2nd step Meditation
appearance and proportions). Then, it was a process to find correction from the conclusion and analysis of visitors, through seeing the mural painting of the ‘Walking Buddha on the Bronze Footprint’.

To gain learning and understanding, they started to test correction from an analysis of the Bronze Walking Buddha statue in Wat Benchamabophit (Figure 29, right). As visitors noticed the image of Buddha’s artistic appearance and proportions; and it was found that all mural paintings of the ‘Walking Buddha on the Bronze Footprint’ that they had ever seen were similar to the Bronze Walking Buddha statue. Hence, they could supplement their knowledge that the work of the mural painting in Sukhothai impacted upon building sculptures with similar shapes. Giving this sample indicates that the original experience was very significant towards learning. In addition, it could result in misunderstanding, and a person probably could not completely increase their knowledge if they lacked a link from the Bronze Walking Buddha (the new one discovered) to the mural painting of the Walking Buddha on the Bronze Footprint (it has never been known before). Therefore, the museum specialists should design media to link new things to the original knowledge, and motivate the learning process to build the experience of visitors for the highest learning.

The process of learning by Kolb’s experiential learning theory to develop designs for learning in the museum, using the following principles:

a. Create a story line with the original content of antiques, in order to link prior knowledge of the audience about antiques with the content provided by use of graphics and sound; for example, works which were designed by the researcher and exhibited in “The Replay: U-Thong Sri Dvaravati” exhibition, as mentioned in Chapter 5; Zones 1, 2 and 4.

b. Create content caused by learning or study itself from the actual implementation. For example, the works which were designed by the researcher and

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56. The 3rd step Conclusion of the abstract principle
57. The 4th step Real practice
58. The classification of experience levels from learning in the museum was two levels. See Kodchaporn Hatsadin, “National Museum for Complete Learning,” 66.
exhibited in “The Replay: U-Thong Sri Dvaravati” exhibition, as mentioned in the Chapter 5; Zones 5 and 6.

2.4.4 Summary

Scholars provided different definitions and meanings of experience, according to each person’s concept. However, the same issue of experience was important towards learning and the perceptions of humans. The elements to emerge the experience in the museum, original experience, direct experience, motivation, media and messages, could all determine or participate in levels of experience and learning in the museum, more or less. Experience and learning when visiting a museum sometimes requires activities to support the presentation. This was the element of ‘application’, to properly obtain the example.

For instance, determining the process of visiting the museum, the teacher was responsible for providing basic knowledge about the story at school, and determining the activities when visiting the museum, such as: drawing, painting, and seeking for answers to a questionnaire designed by the teacher (some museums prepare these for students). When returning to school, they had an opportunity to share and exchange their experiences of visiting the museum with each other, or they probably arranged an exhibition of drawings and paintings, applying knowledge from the museum visit.

Figure 30 Dialogue in the Dark

Source: The National Science Museum, Experience from the Dark, Great Experience was not Only in a Classroom, accessed October 25, 2013, available from http://www.nsm.or.th/index.php?option=com_k2&view=item&id=768
This pattern of learning was one of methods to utilize the museum, in terms of quality more than quantity, as in Thailand.\textsuperscript{59} In addition, learning\textsuperscript{60} from the five senses by visitors was significant to receiving messages. If a person lacked any of the senses, then sight and other senses would be impacted, especially the eyes; the most important sense. The researcher could conclude the results without optical nerve observations of the experience of “Dialogue in the Dark”\textsuperscript{61} (Figure 30). It was found that without an optical nerve, visitors would adjust all other nerves instead. Concentration would reach the toes, wrists, ears and skin, and build wakefulness in their body, and they would walk to the sound they heard. Although they knew that they were in a familiar environment, they were still afraid or worried. This environment could build imagination, and they felt that the human imagination was great when they heard sounds of birds, water, and the smell of flowers, grass and soil. These resulted in relaxing, and imagining an existence of environments and humans. When the optic nerve could be used again, visitors felt that the light increased many times.

This exhibition impacted upon the feelings of visitors because of diverse patterns of the exhibition and media used, and they were suitable for overall contents and visitors. In particular, media not only provided contents to receivers or visitors, but it could build experience and learning until they had feeling and could memorize. It depended upon the pattern of presentation of the museum specialists or designers to appropriately analyze and select the best patterns for the exhibition.


\textsuperscript{60}Perception Theory, Siriwan Serirat mentioned that perception of people was from vision at 75\%, auditory at 13\%, touch at 6\%, smell at 3\%, and taste at 3\%.

\textsuperscript{61}A temporary exhibition the National Science Museum was granted to arrange the exhibition in Thailand. It had been already arranged in 35 countries all over the world. In Thailand, it was opened at Science Square, the 4\textsuperscript{th} floor, Chamchuri Square Building, Samyan, Bangkok. The special guide who was greatly trained welcomed visitors. See The National Science Museum, \textit{Experience from the Dark, Great Experience was not Only in a Classroom}. 
2.5 Chapter Summary

At present, the museum has new standards to gather antiques, including: duties to conserve, study, research, record information, display, make public relations, and provide complete knowledge to people, especially the role of providing knowledge and educational advantages. As a result, the cycle of Thai museums has started to adjust such duties and importance of museums, to become a new type of learning center by developing the patterns of exhibitions and media. However, this has impacted upon some national museums or some museums that lacked the budget for additional development, improvement or additional research. In particular, the archeological and historical museum exhibiting antiques and art objects. Media for presentation was mainly original, and it was used for a long time. The objects were set on tables, with no presentation using new technology or building any interesting points to attract visitors. Nowadays, the behavior and learning of visitors differs from the past, so a gap between visitors and the museum lacks linkage towards communication or between visitors and the contents exhibited. Thus, it is difficult for them to understand, and showing interest in museums has gradually reduced. Thus, solving the problem of media for presentation should build upon the motivation of visitors, by creating interesting media until they become curious and they feel challenged to control themselves and can imagine events.

Finally, the purpose of visiting the museum was to

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62 Kantheera Sanguanthang, “Value Perception and Significance of Design Works through the Exhibition” 14-16.

63 Over one hundred years ago, the museums have been established in Thailand. The National Museum, the local museums, the museums in temples are total more than 1,000 museums. See Patchalada Julpetch, “Requirements of Thai People on Museum,” (Article from National Discovery Museum Institute (NDMI), 2006), n. pag.

64 The museum was not interesting for the public due to many problems. For example, the object arrangement was not interesting and they did not attract visitors; no activity to build interaction between visitors and the exhibition, management, and budget. See Phatlada Chunphet, “Requirement of Thai People Toward the Museum,” (The article from the National Learning Museum Institute, 2006), n. pag.

participate in and understand the exhibition, until visitors had experience and learning through impressions and memorizing each museum.
Chapter 3
Using Interactive Media Technology in Museum Artifact Collections

3.1 Why Interactive Media Technology?

3.1.1 Significance and Importance of Interactive Media

Interaction means that users can communicate with multimedia programs. They can select interesting information or the processing program in a required pattern by using basic equipment, such as clicking a mouse, tapping a keyboard or using advanced equipment, etc., while the program responds by showing an on screen display or makes sounds through a loudspeaker. This component is regarded as one important characteristic in multimedia interaction.\(^1\) In addition, Lisa Lopuck stated that multimedia is a collection of various media-video, sound, graphics, animation and text that come together to form a single unit.\(^2\)

At present, the progress in technology supports a multimedia designer to integrate such usage via a computer system. Users can respond to a computer system by using many methods for both an on screen display and within the real area. This type of media is called interactive media, which communicates between users and systems. According to Gary Olsen stated that multimedia requires that creative thinking and development take place concurrently on several on levels. Since it’s a combination of art and science it is also a convergence of several different technologies-computer programming, video and audio.\(^3\) However, a system with such interaction has to support users to perceive and learn about what they are really interested in, and which motivates them to be creative, study, and use imagination.

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Interactive media combines many different technologies to accomplish its objectives. As the components of technologies develop, they lend themselves to more and better capabilities with interactive media. By enabling users to link data, information and ideas, interactive media helps make the connections which are critical to communication. By integrating text, graphics, sounds, animation and video, it addresses different communication styles, providing a truly interactive communication environment that the user can explore and add to, enabling him to become actively engaged in the communication process.

Such interactive media could create a world of imagination in the museum, by using techniques of building model scenes integrated between the real and the surreal. In the future, it is not necessary that an exhibition room needs to be in the form of a real room. Interactive media could build motivation, which motivates learning within the museum. Tales and the passing of stories in the exhibition could be similar to writing plays or movies. They lead the imaginative world with full emotion and feeling. They could link the knowledge and experiences of each person with objects or contents notable for new learning. This added interest to the atmosphere, which supported perception, learning and feeling easily, and quickly for children and people.

3.1.2 Roles and Influences of Interactive Media Technology

In recent years, people have probably heard the words “Interactive Media” used as one way to respond to users and it is popular in this country and overseas. During the last 5-6 years, it has become more popular because of its highly efficient response rate. Hence, interactive media is currently close to humans. According to Tony Thwaites, Lloyd Davis and Warwick Mules stated that media play a significant role in reproducing the imagined communities of nation, region, city and town and also according to Eku Wand stated that up to now interaction has been seen as a direct component of human communication, as an art transacted face-to-

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face in real time.\(^7\) It can be seen everywhere because, it is not far from humans, and it intervenes in daily life unconsciously. For example, the parking system in a department store can specify a parking space with a light signal, and a sound system can remind you of which floor that you parked on. The closest thing is a touch screen mobile phone, such as the iPhone5, the new iPad, and many brands of Android tablet. When entering 7-eleven, the door automatically sounds “Tik-Tok.” This is interaction using a sensor, a simple principle to monitor movement at the door. When a person or a dog walks through the door, a sensor will order working of a motor and a speaker.\(^8\)

Besides its interaction in daily life, it comprises teaching media called CAI (Computer Assisted Instruction), interactive boards for schooling, management of activities or events, and grand openings to build the image of modern products by using many kinds of interactive marketing, such as interactive floors/walls and multitouch boards/tables. They are entirely interactive media.\(^9\) These were designed to be suitable for application and the requirements of the way people live at present.

Besides interactive media being applied to events to build interest throughout many years, the art cycle in domestic and overseas applied the interactive media to create arts, so that visitors could take a look at creating work with artists. For example, the work of foreigners were exhibited in Thailand, such as the exhibition of “FACE TO FACE Portraiture” in the digital age\(^10\), Figure (31-32) at The Art Center, 7th Floor Center of Academic Resources, Chulalongkorn University. Moreover, the cycle of Thai art started to use this media for exhibitions such as the “Multimedia–Multivisions Exhibition\(^11\)” Figure (33), at the Ardel gallery and the “Cross

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\(^8\) Atithep Chaetnalao, “Why does the Interactive?” in AD Design Architecture & Digital Media Sripatum University (n.p.:n.p., 2010), 24-25.


\(^10\) By An Asialink & d/Lux/Media Arts touring exhibition, Curator : Kathy Cleland, exhibited during 10 September - 16 October 2010

\(^11\) By the new generation of the contemporary artists; Taweesak Srithongdee, Bundit Poonsombatlerd, Wittaya Chanma, and Watcharawut Panlawan, exhibited on 17 August – 26 September 2010
Stitch Exhibition, Figure (34), to present the work of new artists at the Bangkok Art & Culture Centre. These artists’ work was a pilot scheme for designers to use their designs as inspiration for the future.

Figures (31) (32) The “FACE TO FACE” Portraiture in the Digital Age Exhibition  
(Photo by Atithep Chaetnalao, on site studied at Chulalongkorn University on October 16, 2010)

Figure (33) The Multimedia–Multivisions Exhibition  
(Photo by Atithep Chaetnalao, on site studied at Ardel gallery on August 18, 2010)

Figure (34) The Cross Stitch Exhibition: to present work of new artists  
(Photo by Atithep Chaetnalao, on site studied at Bangkok Art & Culture Centre on August 21, 2013)

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12By the works from Ubutsat Group, exhibited during 2 August – 1 September 2013
3.1.3 Thai National Museum and Interactive Media Nowadays

An article under the coordination of the society community (The Thailand Research Fund) in conjunction with Vichakarn.com related to the experiences from the local museum and statements by the public. Some parts of the article stated that “The statement was a bridge to connect thoughts and lifestyles among persons or groups who had different knowledge and experiences. When a person had a chance to listen to others more, the statement could lead to understanding another period.” The article had stated that, although antiques in the museum had value and substantial histories, they could not be explained in detail as much as participation. Therefore, the museum designers tried to find a method to further communicate with visitors. This resulted in interactive media playing an important role, because this type of media could attract visitors to participate in an exhibition more than other media forms could. Seeing antiques does not just depend on ophthalmic senses, but experiences of listening and touching, and others could build visitor experiences for further rapid understanding and learning.

Although interactive media further played a role in the cycle of Thai museums, it was only in part, due to the problems of budgets being more than other common media, and that some museums, both national and local, had not been improved. However, it is accepted that Thailand still has limited budgets to support improvement, and that some museums have been neglected as well. The best solution was for all sectors to jointly develop everything they could do.

With regards to the new development of a museum, Mr. Thira Saluckphet, the Minister of the Ministry of Culture, stated that the operation had to coordinate the private sector for planning new management. In particular, the national museum should apply the patterns of museums from overseas to be ‘the model’. Antiques and art objects should be exhibited in outstanding positions, and multimedia technology, light, color, and sound should be supported to increase interest in the museum. He determined his goal, that when the museum was restored, it would attract youths and their families to visit the museum at least twice a week. Moreover, the foundation should be established to help the private sector’s museums which lost money, so that they could be continually managed.

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national museums have tried to improve or arrange diverse activities from the past until the present.

3.1.4 Summary

Interactive media is regarded as popular media for: events, exhibitions, education, 4D movies and concerts, because it allows visitors to greatly participate in the presentation. In addition, the image of presentation of the national museum is not interesting, is difficult to understand, and only specific for some groups.\(^\text{15}\) Therefore, media development should be continued by presenting new patterns of modern media, such as multimedia and interactive media, as options for the national museums.

Although using this media in the national museum has received good responses from visitors and good feedback to change their attitudes about national museums, in terms of presentations or exhibitions, nevertheless, these media have limitations of the procurement budget, because of required maintenance experts. This is still a problem against the development of interactive media in the museum. From the study, the researcher considers the current problems of the Thai national museums. Thus, the researcher tried to make an experiment to build relations between interactive media and antiques, to find appropriateness to develop presentations and apply interactive technology media to antiques and art objects.

3.2 Field Experiments Interactive Media Integration with Art Objects

3.2.1 Media Organic Concept

The Media Organic Concept was the work that the researcher made to create a study technique and program for designing interactive media. This included developing Interactive Motion (VDO) Mapping with the Ceramic Arts (Figures 35). It included studying visitors’ perceptive behavior, by applying the natural concept of the Ceramic Art and Technology, so that visitors had new experiences to receive contents from the Media Organic design. It was created from stories of the seasons, such as summer, winter, and autumn, and used naturalness of pottery to be a surface to receive pictures, by screening the Motion Graphic (VDO) onto potteries created by Jirawut Duangin. It built stories according to the creative concept, and visitors could freely take a look the work through a Kiosk Media Control without

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thinking about control. From this work, the designer not only created potteries for vision or touch, but also visitors could perceive them by auditory senses, and clearly provide the vitality of nature through potteries.

Figures 35 The Experiment of the Organic Media with the concept of relation between interactive media and art objects (Photo by Atithep Chaetnalao, on site studied at Silpakorn University on February 17-25, 2011)

3.2.2 Experiment of the Media Organic Project Conclusion

With regards to the creation of the Media Organic Project, the researcher created a questionnaire to measure the satisfaction of visitors from very little, little, mediocre, much, very much, and to survey opinions as follows:

3.2.2.1 Visitors very much liked the works.

3.2.2.2 Visitors had opinions of presentation in the “much” satisfaction level, by dividing into the following issues:

a. Understanding of meaning or contents of the works.

b. Interest in the overall content presentation of the works.

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16 Atithep Chaetnalao, “Media Organic from the experiment to work creation,” In AD Design Architecture & Digital Media Sripatum University (n.p.:n.p., 2010), 17.
c. Interest in the content presentation through the interactive media and pottery.

3.2.2.3 Visitors had satisfactory opinions for learning new techniques to create the work in the “much” level.

3.2.2.4 Visitors had satisfactory opinions of design in the “much” level divided into:

a. Interest in the components of the animation application.

b. Beauty of the animation and art of pottery.

c. Appropriateness of the components of sound.

3.2.2.5 Visitors had opinions that a push button can be easily used, in the “much” level.

3.2.2.6 Visitors had opinions that the arrangement and light in the exhibition was proper, in the “much” level.

Diagram 12 The motion series of Organic Media viewed by the audience

Summary of the motion graphic series of Organic Media viewed by the audience (Diagram 12) from the 5 motion graphic stories, the amount of visitors who watched all stories was 20%. This work was specially designed provided that they pushed a button from 1, 2, 3, and 4, as determined, they would be able to watch all stories. This was a tactic used to analyze the visitors’ behavior. Most of them (48%) watched the 4 motion graphic stories because this work was designed
using only 4 buttons, so they thought that there were only 4 motion graphic stories. They mostly did not find the 5th story, because it depended upon selecting a button as per their interest. It differed from the behavior we understood, in that visitors generally might push a button from left to right, the same as counting 1, 2, 3, 4, or on the other hand, they pushed a button depending on their need. Therefore, only 20% of visitors pushed a button as per the number and watched the 5 motion graphic stories, but the rest (32%) watched only 3 motion graphic stories or less.

The results of the experiment demonstrated that controlling visitors was difficult, because of the color of the buttons. It probably resulted from their liking or feeling them. Designing the interactive media emphasized participation, understanding, and the attention of user behavior. The design required a simple application for everyone, and differences in applications should be realized as much as possible. In conclusion, this presentation was successful, and applying this presentation or technique to the historical museum (Diagram 13) which exhibited antiques and art objects, resulted in 96% of people agreeing to use this presentation. It was excellent for real application and was successful. Moreover, 98% of visitors greatly agreed with the designer in developing this Interactive Motion (VDO) Mapping with Ceramic Art in the future.

Diagram 13 Summary of the comments made on “Organic Media” by the audience
3.2.3 Conceptual Analysis from Field Experiments

The “Organic Media” could be demonstrated in the results of creation and design discovery, used to supplement knowledge about the working system. A designer needs to understand all scopes of work and later enhance knowledge of planning, in order to reduce mistakes. The conclusion of knowledge relates to creative media as follows:

The conclusion of the knowledge chart related to the development of “Interactive Motion (VDO) Mapping with Ceramic Art” (Diagram 14). It was the creation of pottery with the design of Motion Graphics that required sound editing. Afterwards, it was the process of mapping between Motion and Ceramics to tell the story according to the contents. It concluded programming by writing an action script to control the working of the animation, through a Mechatronics Control System. Then, the Kiosk Media Control was built to support the buttons throughout the related equipment for the presentation, such as a projector, computer, speaker, and sound system. The final process was installation, and it required analysis about space and lighting for the complete exhibition.

Diagram 14 The Interactive Motion (VDO) Mapping with Ceramic Art
3.2.4 Summary

Not only was this experiment a study about the techniques and program for designing the interactive media, which was the Interactive Motion (VDO) Mapping, integrated with the Ceramic Art, but it also studied visitors’ perceptions and behavior. The interesting issues of analysis are explained as follows:

a. Things to be concerned about which are factors of Interactive Design are: creativity and location, space, lighting, set up, diagram design of equipment, how to install the interactive design, and aesthetics of interaction - more generally user friendly.

b. Most interviewees were pleased by the works in Organic Media, and suggested that this could be used for developing and being applied in a museum which has exhibited antiques and fine arts.

c. Media Organic can bring medias to use for presenting Ceramic Art and making Ceramic Art are more interesting; viewers spent more time in the exhibition and tried to carry on with the story showed in the exhibition. This led to new experiences and ideas, including new research.

3.3 Ideas for using interactive media for artifact in museums

3.3.1 Background of the Conceptual Model

In the past, according to the opinions of ordinary people, they often saw the museum as nothing but an antiques storage area for many antiques. For this reason it seemed to be far from their life and have nothing to do with them. The reason might be because of the exhibition itself, which presented antiques in a showcase with descriptions and a tour guide, in the case of group tours, and most viewers were students and those who were really interested, thus creating a gap between ordinary persons and the museum itself. For now, many institutions are working on this problem and trying to develop the museum in many aspects, including changing their presentations to be more contemporary.

At the present time, many museums have developed and used modern technology for exhibitions, and also there are additional activities to help the museum become livelier and more interesting. This can be noticed in museums which use interactive media, such Siam museum, Nitarasrattanakosin, and the National Department of Cultural Promotion, 19 September Thai Museum Day, accessed June 22, 2013, available from http://www.culture.go.th/subculture3/index.php?option=com_content&view=article&id=134:2013-02-27-10-03-33&catid=3
Museum of Singapore. However, to use these museum as a model for developing Thai museums, such as the atmosphere as well as how to access the exhibition and make it more interesting, these things are quiet difficult, and take a long time to do, due to many factors such as the objective of establishing the organization, the location, and type of the organization itself; yet there are another two important factors which are insufficient budgets and levels of awareness in Thai people, where there is still a wide gap.

Thus, the researcher must have the ideas and methods to bring proper media to use in the museums, as it may be. The changes will be little by little, and adaptable by the budget available is and by the level of Thai peoples’ awareness in different parts of the country, as well as making the museum more lively by adding new experiences in learning and creating some participation in the museum; whereby the audiences acting this way will lead to the solution for boredom in Thai museums, which happens to Thai people this very day. The audience takes part in the exhibition by using multimedia and interactive media as the form of media presentation. Furthermore is the content of the artifacts to create a highly engaging and fun experience, and induce feelings of the audience into the atmosphere when visiting the site even more.

Diagram 15 Ideas of using interactive media technology in museum
3.3.2 Ideas of using interactive media technology in museum

The concept of creating an interactive museum with participation that leads to the development of Thai museums becoming livelier, can attract the audience’s interest at higher levels, by focusing on the effects upon the viewers. According to the researcher’s ideas and guidelines, perceptions of museums are proposed in the form of creative processes that bring about viewers’ perceptions, through the creation or stimulation of their involvement in viewing the museum, leading to fostered feelings and learning in the viewing of museums, due to the fact that involvement can create experience and feelings through the five senses of humans perfectly well. Without the involvement of viewers, either cognitive or by action, it would be difficult for them to understand the communicated materials, or otherwise it would make the materials not as more intelligible to them, as expected. Based upon the researcher’s concept there are five elements that causes new experiences of museums are proposed: museum, content, media, community, and audience (Diagram 15). Importance is attached to Media in helping the presentation create perceptions, so that the Media is importantly able to communicate with viewers directly, and effectively able to link to such other elements as museums, content, community, and audience. According to the researcher’s concept, the five element meanings can be explained, as follows:

First, museum organizations, including the executives from the central and main board committee of each museum, are considered important persons who push each policy further, as well as developing and maintaining the attitudes and obligations of the museum. The museum curator has studied ancient objects and broadcast academic work. Officers from each department take care of taking over by adjusting administration strategies, and the attitudes of executives from the central and main board committee of each museum. They also have to develop the policy further, and an approach strategy has to be applied more. Thinking and solving problems and the work performance of officers; atmosphere developments are the key to solving all issues. The government should change direction, and expand upon the limitations of learning in order to improve people in the nation through museums. By building new museums and such, it will not be an
overnight improvement; the administration adjustments have to be focused, in order for visitors not to feel like museums are not growing.\textsuperscript{18}

Second, content of displayed ancient objects in the exhibition rooms, including the history, subjects and those ancient objects, are the key to narrowing the story. To create true and suitable subjects for visitors is not the museum’s intention only. The content can be circulated to conform to the current situations of the community. For example, when there is a conflict in society, the museum can apply that to broadcast the sacrifices of heroes or Thai ancestors, and focus on the wonder that consolidates Thai people peacefully\textsuperscript{19}. The museum can also have an exchange project with another museum and increase the numbers of displayed ancient objects periodically.

Third, media is used in presenting the displayed content of the museum, to describe the details of ancient objects and ancient arts, such as a banner, message, and a guide book. At present, the media used in most Thai museums is a regular guide book, which is plain and not interesting. Due to the fact that the media chosen conforms to visitors’ interests, but visitors have already used to them, therefore the researcher’s concept is to bring new media or interactive technology to the museums. The interactive media integration is applied with the same content, but the location can create liveliness and build recognition to visitors, as well as attract and encourage interests, joy, and knowledge at the same time.

Forth, community or a group of people in the area of Tumbon, Amphoe, or the provinces, including schools, institutes and government organizations are becoming more involved in museums. For example, in history subjects, social science subjects, or even arts subjects, students can visit museums to learn other than just studying through textbooks, by creating an atmosphere for students to feel


\textsuperscript{19}The Siam Society under Royal Patronage, “Thai Museum: The Potential should be Affective” (A Record of Academic Talk on Thai Museum: The Potential should be Affective, arranged by The Siam Society under Royal Patronage, 21 July, 2010), 16.
like this is another classroom in which they can study and obtain knowledge naturally, or the community can visit and hold meetings, seminars, or activities on certain occasions.

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<tr>
<th>Audiences / Visitors</th>
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<td><img src="image-url" alt="Image of Audiences in the U-Thong National Museum" /></td>
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Figure 36 Audiences in the U-Thong National Museum
(Figure by Atithep Chaatnalaoo, on site studied at U-Thong National Museum on March 15, 2011)

Fifth, audience or visitors in museums include the general public, tourists and student groups (Figure 36). They are important because no matter how effective museum management is, it would be to no avail if not viewed. On the other hand, good management of the museum is another way to attract more visiting people. Therefore, viewers can be a reflection of the museum management’s success. Nevertheless, success cannot be measured merely by the number of viewers, as all the resulting outcomes from people’s viewings have to be factored in, when it comes to perceptions and obtained experience. At present, most people visit museums to take a walk, and not for serious study for knowledge, because museums mostly display antiques that are uninteresting and unattractive to them, and have no activities that bring about interaction between them and the exhibition. Accordingly, surveying the needs of viewers and the expectations of surrounding communities, and the opinions of society as to which styles of museums they want to see offered, would be essential, as they would lead to ideas of organizing and displaying, and management that is consistent with audience’ needs.\(^{20}\) As a guideline

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to creating museum awareness, viewers have to be involved in the viewing of museums, in reliance of cooperation from multiple parties or the elements analyzed by the researcher as a concept for the perceptions of museums through involvement, namely: museums, content, media, and community.

The museum itself has to prepare such areas, as well as giving free entry on some occasions, and hold exhibitions to support or even be involved in seminars through creating a friendly welcome. These matters can show the value and prowess towards museums. All successful museums are because of: well-planned administration, officers, activities, interestingly displayed ancient objects, marketing, location management, community participation, and local organizations. Museum officers have to learn these methods to adapt and apply them to build successful museums.  

To choose the media to use in ancient objects and ancient arts exhibitions in national museums, in order to create knowledge and recognition in the museum by participation, is not only by replacing general media with interactive media, but other suitable foundations, proper orderly plans, and good analysis can lead to successful and effective exhibitions. They can encourage visitors to see the values of ancient objects and arts, and understand the content more. Meanwhile, a lively atmosphere supporting an interesting environment needs to be built. This concept will help develop the exhibitions of national museums and, therefore, it is another great alternative to use interactive media as a tool to acquire participation from visitors, so to encourage them to have new experiences. The knowledge structure of visitors is through the object’s knowledge and the order of events and activities, combined with an existing knowledge frame, helping to link this obtained knowledge together.

3.3.3 Framework of using interactive media technology in Museum Artifact Collections

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21 Patchalada Julpetch, “Requirements of Thai People on Museum,”.

Museum artifact collections using interactive media technology started from studying about several interactive media which could be used in a museum which exhibited antiques, artifacts and historical collections, by setting them in a showcase. Researchers focused on the combination of interactive media studies which were exhibited with the artifacts. The main idea was working on the scope of the combination of modern technology under the coexistence of antiquities and technology. Researchers selected the appropriate technology for antiques presentation to have worth and which could communicate to the audience. Selecting the appropriate technology would correspond with a conceptual framework as the scope of the original space for the mainstream. Next, they studied about the original space, size and area figure, to see the possibility of equipment installation. This study would come under the prototype exhibition. The antiquities which were available would not be moved. The researchers analyzed the prototype content that had been exhibited. Then, they thought about the ways of additional presentation and vivacity, to make the audience gain new experiences. They selected multimedia to make the atmosphere of visual and sound environment simulations for making a new experience for the audience, by using interactive media to present the contents, participation of the audience and interestedness.

Selecting the appropriate technology for the contents to create such interest needs to use a creative presentation style which not only uses novelty, but also presents the contents clearly, easy to understand and use, and impresses the audience. Media selection needs to think about the scope of the audience’s appropriate recognition, and reach into their daily life. So, it is needed to study what kind of main audience visits, which education level they have, and whether they are interested or like certain parts of the former area of the prototype exhibition, in order to compare and find the correct way to promote or modify the exhibition.
The concept has to promote the audience to let them want to find knowledge about the exhibition. Presentation style has to think about the budget which will arise. Using an appropriate budget, and not using it beyond the capacity of the existing budget, to help people who want to study, can greatly aid further development and bring it to realistic use in other museums. Therefore, researchers

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selected to use the interactive media technology in general, then applied, developed and modified it a little bit along the way to ease maintenance.

From the results of studying and analysis, both in the documented section and experimental creations, the researchers have seen the issues which are involved in bringing interactive media technology to exhibits, along with the antiquities in the museum. They assigned the framework that should be thinking about the interactive media design exhibited in the museum (Diagram 16) as follows:

3.3.3.1 The framework of the original area

For the design, researchers scoped the concept of the creation exhibits in the original area, with the physical prototype, width of the area, proportions of empty area, conditions of the original area, and the prototype exhibition. These things were the proposition of the exhibition through the addition of the appropriate interactive media technology, and have to remain in the same environment of the area to be in the same condition.

3.3.3.2 The framework of the prototype exhibition

Most of the museums were established a long time ago, and have an exhibition setting of antiquities in a showcase. Most of the antiquities are hundreds years old, so their condition is quite very worn and of high value. This makes most of the antiquities have to be kept in a showcase. In addition, the big and important antiquities will be exhibited in a special way or outside of the showcase. Researchers scoped the concept of co-design with the prototype exhibition style, and will use the integration principles of the prototype exhibition with the new exhibition media, and not permit any effects upon the prototype exhibition, by not moving or hiding the antiquities in a former exhibition room.

3.3.3.3 The limited frame of the budget

Generally, national museums, local museums and private museums, which are managed by inhabitants or a group of local people, will be faced with a limited frame of budget problems when wishing to establish, take care of and improve the museum. These are factors of the museum. For designing, researchers scoped the concept of this limitation by framing the budget not to be too high for controlling the budget in further development of the museum, by focusing on the use of existing technology and daily life, so as to use the budget worthily and make the best benefits.
3.3.3.4 The frame of knowledge searching

Communication which occurs generally in the museum is to make the audience gain knowledge and understanding, and make them become improved. However, for the audience to understand, the first thing should be whether or not the audience is interested in wanting to know more about matters concerning the exhibits. When the audience visits the museum, the media for communication needs to be easy to reach, and not be complicated both in usage and interpretation, whether through language, images or sound, etc.

3.3.3.5 The frame of recognition

The basic knowledge of the audience is one factor involved in data recognition. The data type may be a message, image, light, color or sound, etc. The basic knowledge of the audience affects the content understanding and media interpretation which are used in the exhibition. Researchers had framed the recognition of the audience for use in the analysis of the design process, when the audience wants recognition, learning, new experience, a participatory feeling and memorizing.

3.3.3.6 The frame of participation

When visiting a museum which exhibits antiquities and artifacts, it is mostly visiting by vision, reading the subtitles, documents and textbooks, or listening to the descriptions from the guide. These make the audience to be quite less motivated. So, most of the audience will only be people who are really very interested. For a group of general people, they are less interested in visiting. For designing, researchers framed the participation of the audience, focusing on the audience to be a part of a visitation in which they can take control and participate in the activities occurring between the audience and the antiquities, in order to create interest and motivation, along with achieving recognition, learning, feelings and memory.

3.3.3.7 The frame of coexistence of antiquities and interactive media technology

It is known that antiquities and interactive media technology are quite contrary, like combining the old and the new. However, researchers have the concept that technology will help to create interest from the audience and to introduce novelty, together with convenient data permitting access which can make
or increase the value of the antiquities. Importantly, interactive media technology and the antiquities must be able to stay together seamlessly.

3.3.3.8 The frame of increasing revitalization and new experiences.

The researcher has created a frame of work through the concept of increasing revitalization to the museums, and has created new experiences for the visitors. Revitalization of museums is resurrecting the past, to create liveliness and to have interactions with the visitors; as a consequence, new experiences are built, including creating different and lively exhibition areas.

3.3.3.9 The frame of creative presentation

The exhibition of ancient objects is to present them. This can be by displaying, reproducing the occurrences, explanations, messages or sounds, etc. These presentations need to have artistic ideas and designs all together, using techniques or pictures. Lecturing also needs a wide range of knowledge; even in psychology, these matters require experts in many fields, in order to develop the exhibition to attract people and to create originality in the museums.

3.3.3.10 The frame of new technology integration.

The researcher has specified a new technology integration to create the balance of technology and the presented substance of the museums. The ideas of new technology integration are various, therefore general and existing technology is used. For example, sensor systems and devices are being repaired and adjusted, to apply them suitably to the substances and ancient objects. To use these technologies, extra carefulness must be applied in order to avoid the effects and any damage that could happen to the ancient objects.

3.3.4 The Design Process Model Using Interactive Media Technology in Museum Artifact Collections

The researcher has analyzed and summed up the Museum Artifact Collections Using Interactive Media Technology Design Process Model in 5 steps,

24In the summary of the Museum Interactive Perceptions Design Process Model, the researcher’s analysis is based on the experimental process under the concept of the co-use of interactive technologies in the exhibition of artifacts and art objects, in the original display room of the exhibition “The Replay: U-Thong Sri Dvaravati” at the U-thong National Museum; which was inspired by the ADDIE Model system and the Multimedia Design Model by Center for Education Integrating Science, Mathematics and Computing (CEISMC), Georgia Tech College of Sciences.
which are: the analysis, the design, the development, the installation and the evaluation, as displayed in Diagram 17. The details of these 5 steps are as follows:

Diagram 17 The Design Process Model Using Interactive Media Technology in Museum Artifact Collections
3.3.4.1 Analysis

The first step of work is the analysis (Diagram 18), a very important step in the design process and the creation of the exhibition. This step is the process which collects and analyzes data of various aspects, such as general information about the museum, the original exhibition, the contents, the space and the audiences. This process includes the writing of a project regarding the co-use of interactive technologies in the exhibition of artifacts and art objects, which is a working approach in response to the objectives. The details of the methods can be seen as follow:

Diagram 18 displays the analysis diagram

- a. Museum Information Analysis are based on Background, Management, Development Plans and Policies
- b. Original Exhibit Analysis are based on Analysis of Original Exhibit Pattern, Analysis of Data on Display
- c. Contents Analysis are based on Contents Regarding the History and Importance of the Artifacts, Artifacts’ Ability to Narrate Their Own Stories or to Explain Their Own Contents, Materials and Surfaces of Artifacts, Size: Width x Length x Height (Depth) and Special Features (Shape of the Figure).
d. Physical Space Analysis are based on Analysis of Zone Sequence and Plan, Physical Space Characteristics (width X length X height/depth), Electric System, Lighting System and CCTV, Suitability of Original Exhibition for Artifacts.

e. Audience Behavior is based on Basic Information of Audiences, Audience Satisfaction.

f. Project Proposal including Objectives, Target Groups, Project Framework/Project Roles, and Operational Plan.

3.3.4.2 Design


3.3.4.3 Development

After the design process or pre-production is completed, there is an important process which is the ‘process of design development’, based upon the concept model and designed prototype. This allows further improvements to production that can create applications such as contents, techniques and programs.

Digital content production and development of techniques and programming play a significant role in this process, where a development plan is required. In addition, good production results from comfortable and quick operation and corresponds to sets objectives. The development processes consist of: Digital Contents Production, Techniques Development, Programming Development, Infrastructure of the development of component exhibits, Graphics Board Production and Implementation.

3.3.4.4 Installation

Installation of device structures, techniques and contents, exhibition management plans and installation maintenance are as follows: Preparing to Install, Installation by Specification, Final Test, Exhibition Management, Maintenance after Installation, Demolition (Temporary exhibition).

3.3.4.5 Evaluation

Evaluation refers to a comparison of the original exhibits divided into 2 sessions, which cover an evaluation of audiences at new exhibitions, based upon the concept of the researcher and original exhibits, through
observations, questionnaires and interviews. The scores and responses are summarized in terms of an effectiveness evaluation report of the exhibition.

Diagram 19  The conceptual model using interactive media technologies in museum artifact collections

3.3.5 The conceptual model using interactive media technologies in museum artifact collections

The model on the following page is a conclusion of “the model concept to create new experiences in a museum through participation”, as well as a collection of working processes from the model of interactive media technology
development placed in collaboration with an exhibition of ancient artifacts and art objects.

This is a model obtained from an idea the researcher tried to present as an alternative. The alternative was to replace the construction of perceptions within a museum’s exhibition of ancient artifacts and art pieces in an original presentation style, using shelving and explanatory signs, and using interactive media technology as its medium. It was expected that the new medium would be able to connect to and communicate with audience, through an emphasis of participation between audiences and exhibition content. The researcher brought this idea to experimental level and developed it into the exhibition “The Replay: U-Thong Sri Dvaravati”.

This model could be used to explain the concept and development processes, as well as the working processes needed for the construction for awareness through interactive media in a museum (Diagram 19) as follows:

**Step 1: The Conceptual**

The concept was a crucial starting point of this particular concept model’s process. The model started from the center and panned out. The 4 external comprised: the museum, the content, the community, and the media. The 4 components were connected and could construct awareness in the museum through participation, and awareness could be created simultaneously. However, the format could differ depending upon the context of the museum as well.

**Step 2: The Framework**

To consider the media in the 4th step, which has a level under it; it is similar to the wheel of “Dhammacha” that kept on spinning. In each sector, there would be a different context, and these were the conceptual framework of the model. This was no different to a principal that must consider the development of

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25. The developmental process model using interactive technology to co-exhibit the artifacts and art pieces.

26. The explanation and meanings could be read from the conceptual model of Chapter 3; “The conceptual model to create awareness in a museum through participation”.

27. One could read the explanation of formats to create awareness in museums through participation. All 4 aspects were from the conceptual model in Chapter 3’s “The conceptual model to create awareness in a museum through participation.”
interactive media, for the construction of participation and awareness in the museum, and in its entire 10 sectors. This started by a consideration from right to left, or clock-wise, continuously, by starting from it is as follows:

a. The original space; that is, the design media and work under the original environment and context, within the original space as exhibited by the museum. What changes could be made or modified by having the least impacts upon the original space? Still, addition could only be made according to appropriateness and necessity only.

b. The original exhibition; that is, the new exhibition’s design ought to start by analyzing the original exhibition, which was done in a shelving format. The design could add equipment, but could not be moved around the exhibition.

c. Budget; that is, the design ought to keep in consideration any expense that was not higher than necessary. This concept aimed to utilize techniques and equipment with the highest efficiency.

d. The search of knowledge; that is, the exhibition design must appropriately give the audience knowledge.

e. Awareness refers to the audience’s desire to learn and to become aware. They hope to learn, to have new experiences, to create memories, and use these for future applications.

f. Participation refers to allowing audience participation with storytelling, to be able to choose what to observe and to become more aware of while observing.

g. Homogenous co-existence; this refers to the co-existence between ancient artifacts and interactive media technology. They must be well-integrated, especially in terms of technology and techniques, as well as the digital contents. They must not be more recognizable or draw in too much attention from the exhibition itself.

h. Liveliness; this means that exhibition must be designed in a way that creates liveliness within the exhibition rooms.

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28 One could read the explanations and definitions of the frame’s 10 aspects from Chapter 3, under the topic ‘4.3 Using Interactive Media Technology in a National Museum’.
i. Creativity; this means the exhibition must be able to draw interest from the audience. The exhibition must be different from previous presentations by the museum.

j. Combination; this refers to the integration of modern technology for appropriate applications with the content. This includes communication tools concerning the audiences’ daily lives.

The 10 sectors of this framework are an inter-connected circle, with the concept and interactive media technology design placed in collaboration with the museum’s exhibitions of artifacts and art pieces. The exhibitions would take turns, and the design process consisted of 4 steps.

**Step 3: The Development Process**

There were 4 steps within the developmental process. The processes were completed sequentially: the first step being “Analysis”, the second “Design”, the third “Development”, and the fourth “Installation”. These would be separated into 4 sectors, starting from a clock-wise direction.

The first step was analysis, and these were the steps of the analysis: The model would pan out continuously, until it reached the last step of the analysis. The first step was to analyze the data. The second step was to analyze the original presentation format. Next, was to analyze the content, the space and the audience. This was the step that could be done simultaneously. After that, it would reach the project’s conclusion.

The second step was the designing of various parts that had been analyzed, complemented with the establishment of an exhibition’s topic. Then one could proceed on to designing the space for utilities. This would be done at the same time as the interactive media technology design, followed by the digital design. It would be put in use in the actual space. The last part involves creating a prototype for development of future steps.

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29 One could read for additional explanations and definitions of the developmental process from the 1st step to the 4th step, up until the 4th step: Evaluation from Diagram 17 The Design Process Model Using Interactive Media Technology in Museum Artifact Collections.
The third step: Development. This is a step of developmental and experimental processes, and it leads to production starting from digital media production. Then, it would follow the development of techniques and program writing. This would be followed by equipment development and, at the same time, the production of graphical work. Finally, it would be implemented in the actual field, for development, adjustments and improvements, until it became appropriate for its installation.

The fourth step: Installation. This is the step of installation in the actual area for its true utility, starting from a number of preparations. This would be followed by installations of various regulations, and a trial in a specific duration as previously set. There would be management of the exhibition’s administration and maintenance. Finally, when the exhibition was over, then would come the steps of uninstallation and tidying up the exhibition area, to return it to its original condition.

From all 4 steps, in reference to the model, steps that were shown to be on the same level meant that progress could made done simultaneously. This was considered of equal importance, as well as the similar working format.

Step 4: Evaluation

In reference to the model, this was the outermost layer. An evaluation was the final step of the 4 steps. Finally, it would be evaluated concerning 3 issues: starting from the right, clock-wise, was an evaluation of the budget’s benefits. This meant a budgetary evaluation of whether or not the expenses were appropriate for the end-result and beneficial earnings were made. Next, was an evaluation of improvement that meant an evaluation of various utilization techniques and, finally, an evaluation of results, which meant an evaluation of results and whether they went according to aims or planned objectives, or not.

3.4 Hypothesis of Using a Model

From the concept of acquiring knowledge by participation, it is applied to be used in museum artifact collections by focusing on participation together with presented interactive media, resulting in the following hypotheses (Diagram 20):

a. Using interactive media in archaeological and historical museums can encourage and build interest among the visitors.
b. Using interactive media can result in further participation of visitors and create new experiences, perceptions, learning, emotions and memories for the visitors.

c. This concept can be used as a model to help developing and adjusting Thai museums, according to Thai people’s recognition of the present; and to create good attitudes towards Thai museums through changing Thai museums’ presentations to be more partaking, gradually.

3.5 Chapter Summary

The main subject in this research began with the popularity of Thai museums in the last 5–10 years. Interactive media has been included in exhibitions, because it can provide interest, joy, and more understanding towards the subjects. For example, the Ratanakosin exhibition in Siam museum and Dragon Descendants Museum, has adapted its presentation model from foreign museums, such as Singapore, the USA and European countries.

Even though the result is quite good, not all Thai museums can be adjusted or build more museums, due to issues and conditions, such as: the objectives of building, limited budgets, locations, organizational patterns, and the recognition and education obtaining behavior of the visitors. Therefore, the matters
mentioned of applying interactive media to existing museums are developing gradually, not suddenly.

From studying documents and location inspections throughout the study via the Media Organic experiment, the researcher has created a concept of recognition in the museums through a participation model which is composed of: museums, subjects, media, community, and visitors. The researcher has focused on such media by experimenting with interactive media to support the participation of visitors and the subjects, to use it as a middleman to deliver knowledge and recognition according to 10 specified frameworks.

The concept of the model conforms to the specified frameworks, and from this concept it can analyze the possibility of solving the problems of Thai museums. Thus, the researcher has tested this by creating a presentation in a real location using ancient objects and a historical museum, wherein the chosen one was U-Thong National Museum, Suphanburi province. To start the presentation testing, they inspected a location, experimented, designed the work, and presented it to collect data. The results would help the researcher to analyze the possibility of a concept model used to create recognition and knowledge through interactive media, together with ancient objects and ancient arts.
Chapter 4
Developing Prototype by Using Interactive Media Application at the
U-Thong National Museum

4.1 Why U-Thong National Museum?

4.1.1 Background and significance

U-Thong National Museum was established by the Fine Arts Department on May 13th, 2509 B.E., and King Bhumibol (Rama IX) and the Queen Consort Sirikit visited the area and ceremonially and officially opened “U-Thong National Museum” (Figure 37). The building was to be used for the preservation and exhibition of antiques obtained from exploration and archaeology findings, such as antiques of the Dvaravati period\(^1\), as well as an exhibition of antiques obtained from ancient times of the past 2,500 years, between 2507 and 2509 B.E. Professor Jean Boisselier, a French expert in archaeology and art history of the South-East Asian region, then head of the Fine Arts Department, conducted an archaeological exploration in the ancient city of U-Thong, as well as researching about archaeological findings regarding the ancient city of U-Thong\(^2\) (Figure 38).

The evidence of Suvarnabhumi’s existence appeared in foreign documents concerning trade and the exchange of commodities by foreign merchants. Both Asia and Europe could be considered the pivot of ‘World Trade’\(^3\) back then and, because of that, they obtained various cultures, such as regions and languages, and adopted them into the lifestyle of the community, further developing such into a historical community, especially in terms of religions.

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\(^2\)Advice leaflets Thong National Museum, supports printing, Administration of Designated Areas for Sustainable Tourism Administration (Public Organization).
\(^3\)A statement made by Professor Pasuk Intravut, Archaeologist, Silpakorn University.
The ancient city of U-Thong was considered to be the center of Suvannabhumi’s land of Buddhism, reasoned because archaeological explorations unveiled many crucial antique findings, such as the Dharmachakra Stone, with platforms and pillars. It was considered the only antique in perfect condition in Thailand. This resulted in Thailand, which was a part of Suvannabhumi, attaining a unique form of culture called the “Dhamma-Daravati culture”. The first central area was at the ancient city of “U-Thong”, an area of Amphoe U-Thong, (U-Thong district), Suphanburi province.

Figure (37) King Bhumibol and Queen Consort Sirikit performed the opening ceremony of U-Thong National Museum, on May 13th, 2509 B.E.

Figure (38) The archaeological exploration in the Ancient City of U-Thong in 2507–2509 B.E.

Figure (39) The exhibition building of U-Thong National Museum in the past, as of 2509 B.E.

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Dvaravati culture was a critical culture. It affected other cultures of Thailand in times soon to come. It was an indicator of the selective acceptance or the changing culture of ideologies and materials, in order for all to live together peacefully for a long time. As such, it could be considered the pillar of Thai culture, concerning beliefs and thoughts over a very long period of time. Nowadays, U-Thong National Museum (Figure 39-40) remains the learning center of archaeology and history; for students, university students, academics and tourists.

Furthermore, the ancient city of U-Thong also maintains importance to Thailand and its local community histories. Presently, the “Designated Areas for Sustainable Tourism Administration” (Public Organization), or “DASTA”, has a plan to create a model scheme aimed at developing a special area of U-Thong ancient city.

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6 Designated Areas for Sustainable Tourism Administration (Public Organization), DASTA aims to reshape the ancient city of U-Thong into a creative city—hopes to attract China and Japan—Open up a market for neighboring countries, accessed March 10, 2013, available from http://www.dasta.or.th/th/operating-news-2/178-178.html
(Figure 41). It has put in promotional works for the ancient city of U-Thong to become a tourist destination on a national level as well, in additional to promoting the city to become a cultural tourist destination for Thais in the near future.

4.1.2 Ancestors of U-Thong City

The researcher has a connection with the history of U-Thong. This is due to the fact that U-Thong district, in Suphanburi province, is the researcher’s birthplace, and as such it can be considered that the research was born from a person with respect for U-Thong; a family line descending directly from the people of U-Thong. The researcher grew up living in the district of U-Thong, Suphanburi province and, because of this, the researcher developed feelings of attachment to the local lifestyle, the dialect and the culture, as well as towards many historical backgrounds, and it became a boundary of the local people regarding religion, culture and traditions.

U-Thong is an ancient city with a history of Thailand. It is regarded as a major city, with many attractions and historical sites, and it also makes local people feel proud of their cherished traditions, culture and history. Each year there are events of stories past and the history; for example, the “U-Thong of Civilization Suvarnabhumi, 2012”, (Figure 42) at U-Thong District, Suphanburi province. This is a great event using modern techniques and light and sound, to create an atmosphere and a story that demonstrates the importance of history and the history of the ancient city of U-Thong itself. The mind is an anchor it instilled in generations of love and pride of the ancient town, from generation to generation.

These factors caused the researcher to develop an interest in studying the history of U-Thong city and the people of U-Thong’s stories from the past, based on the National Museum of U-Thong’s exhibitions of antiques—all directly connected to history, norms, beliefs, lifestyles of the predecessors, arts and culture, as well as the background of Buddhism; these are the main contents of the exhibition which inspire the researcher to deliver the background, the story and knowledge to visitors, tourists and locals. The researcher believes that the local work will receive positive feedback.

Also, there will be family support to the teams while doing fieldwork; be it in terms of accommodation, food, and venues—thus, providing
convenience. In addition, the researcher will have the opportunity to create a project reciprocating their hometown.

Figure 42 U-Thong of Civilization Suvarnabhumi, 2012
(Photo by Atithep Chaetnalao, on site studied at U-Thong District on December 10, 2012)
4.1.3 The cooperation from U-Thong National Museum

Mr. Panomboot Chantarachot, the director of U-Thong National Museum, under the Fine Arts department, Ministry of Culture, kindly permitted the researcher to use U-Thong National Museum as a case study. He stated, “I am extremely pleased. I have read the academic papers and thought it is a good project indeed. I also thought that this particular concept could be of use to U-Thong National Museum and many others, all of which could further develop based on this concept. Should you need anything, please do not hesitate to call me.” From many visits and interviews with him (Figure 43), it appeared that he was a scholar and a director who held interest in organizing exhibitions at museums, and was open to

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developmental concepts concerning museum exhibitions. He prioritized and agreed with the researcher’s concept, and was ready to cooperate in this particular research. Throughout the entire duration of study in the area of U-Thong National Museum, he was most welcoming, and provided full support in all aspects; as well as following developments very closely, organizing officers to help facilitate the researcher and the team (Figure 44). This made the study at U-Thong National Museum convenient, and open to be studied at all service times. Additionally, the museum’s curators and officers (Figures 45-46) were most facilitating. All were very helpful in providing resources. Through the entire period, from working in the field up until the organization of the exhibition, the researcher received assistance in terms of information provision to be adapted for usage within the exhibition arrangement, information about general patrons, as well as being permitted to bring various equipment into the exhibition room, such as projectors, computers, ladders, wood pieces, and a mock model. Even with the risk of damaging antiques, the museum still trusted the research team in their conduct, and caused no pressure. All security guards took care of the research team, both in and out of the typical opening times. As such, it could be considered that all individuals at U-Thong National Museum have been most kind-hearted and generous to the researcher and his team; this deeply impressed the researcher while conducting work at U-Thong National Museum.

4.1.4 To conclude the appropriateness of concepts, in terms of exhibition content.

The researcher has evaluated that U-Thong National Museum is appropriate for the concept and the research method, as well as the physical features to be appropriated for the study of the model. It also happened that U-Thong National Museum exhibited content and stories of high significance to Thai history, with connections to Buddhism, trade and the origin of various cultural art forms.\(^8\) Not only was the museum suitable as a study case, but the other context prioritized is that the executives recognized the importance of this research concept, 

\(^8\)Srisak Vallipodom, *Thai Archaeology in the past decade* (Bangkok: the ancient city, 1982), 24-25.
in that it will be beneficial for U-Thong National Museum, and they were ready to provide full support. Officers of all departments were also cooperative.

The researcher thus deemed that U-Thong National Museum is a suitable choice to be selected as a case study for the model development in this research. Additionally, the researcher was also fortunate to be able to conduct research in his hometown. Because of this, the fieldwork always gave the impression of heading back home, due to the familiar vibes given off by the people, the dialect and the language, which resulted in the researcher being happy and able to proudly work on this project.

4.2 The Study Room

4.2.1 Analysis of Traditional Exhibitions of U-Thong Sri Dvaravati Room

The general physical characteristics of the exhibition emphasized disclosure of authentic pieces. The atmosphere of U-Thong Sri Dvaravati room (Figure 47) was neatly arranged by categorization of antique objects. That is, the objects were placed on the exhibition shelves and equipped with detailed explanations; those such as the name of the object, its origin, its discovery, its age, its type, and its

Figure 47 The traditional exhibition setting of U-Thong Sri Dvaravati room, U-Thong National Museum
(Photo by Atithep Chaetnalao, on site studied at U-Thong National Museum on March 15, 2012)
usage by the people in the past. There would be details both in Thai and English. If there were any objects of particularly notable significance, then there would be a more in-depth explanation provided by reading additional information in the visitor guidebook Which the objects had codes attached.

The allocation of antique objects in Sri Dvaravati room is consistent. Small objects would be shown on exhibition shelves according to their categorization of content, such as an image of Buddha on a piece of baked clay, a sculpture of a human walking a monkey, Dvaravati beads, utensils and accessories. In contrast, large antique objects would be placed around the room instead; placing 6 objects together on a base. Important antique pieces consisted of a Buddha statue of the ‘First Teaching’ posture, Dharmachakra, platforms and pillars.

An additional exhibition area, which contained no real antique objects, was the “2 pagoda models”, which were proportionately small, though still possessed beauty. They were placed next to a pillar, which made them slightly difficult to view. The atmosphere and lighting of the exhibition overall gave a feeling of dullness and reminded patrons of ancient times, by using soft yellow light to shine on the antique objects, making them look elegant, valuable and worthy of being the protagonists of this particular exhibition room.

4.2.2 Analysis of the Content of U-Thong Sri Dvaravati Room.

At present, the exhibition in U-Thong Sri Dvaravati room illustrates a story through antique objects; demonstrating the importance of arts and culture in the Dvaravati era of U-Thong, the ancient city, as Thailand’s city of the earliest historical era; a trading center and the center of Buddhism before it was all distributed to other ancient communities.

There were many significant antique objects exhibited, such as the “Stone Dharmachakra”, bronze Buddha statues, baked clay Buddha statues, beads, accessories and architectural pieces, and many more. However, what was considered to be ‘the’ antique object of the most perfect condition ever discovered in Thailand was the ‘Stone Dharmachakra’ with its platform.  

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Figure 48 The content categorization, lay out plan, and circulation of U-Thong Sri Dvaravati rooms
The exhibition room was then categorized from the researcher’s analysis into 6 Zones as the figure 48.

Zone 1: at the entrance, there would be a sign, containing explanations relevant to what was exhibited in the room before the patrons enter the exhibition room (Figure 49).

Zone 2: The introduction room or welcoming zone consisted of a mock pagoda of U-Thong ancient city, numbered the 2nd and the 13th (Figure 50).
Figure 51 The Buddha statue (Zone 3)

Zone 3: The Buddha statue (Figure 51), that is the status of the ‘First Teaching’ posture, was exhibited in the center of the room. It was considered the main attraction, and was the first object the patrons sighted once they looked into the exhibition room.

Figure 52 Dharmachakra and the platform (Zone 4)

Zone 4: Dharmachakra and its platform (Figure 52). These were exhibited at a central point behind the Buddha statue (Zone 3), and consisted of the Dharmachakra, the platforms and the pillars. They were considered another main attraction point of this exhibition room.
Figure 53 The head of a Buddha statue (Zone 5)

Zone 5: The head of a Buddha statue (Figure 53). Placed around the room and hung in mid-air consisted of a demon’s head, a Garuda, a pagoda top, a cement sculpture of a giant’s head, and a giant’s head.

Figure 54 The small antique objects exhibited on the exhibition shelves (Zone 6)

Zone 6: Small antique objects exhibited on the exhibition shelves (Figure 54) consisted of: the 1st shelf; bronze Buddha statues, the 2nd shelf; an image of a Buddha on baked clay, the 3rd shelf; a shelf for baked clay pendant-like Buddha
imprints, the 4th shelf; a baked clay sculpture piece, the 5th shelf; a sculpture of a human walking a monkey, the 6th and 7th shelves; Dvaravati beads, the 8th shelf; accessories, the 9th shelf; utensils, the 10th shelf; architectural pieces from the era of Dvaravati, and the 1th1 shelf; a cement mixing artifact from the Dvaravati era.

4.2.3 Analysis of the Physical Space of the U-Thong Sri Dvaravati Room

The researcher separated the analysis of areas into 2 parts: in terms of viewing area within the exhibition room and the proportions of the exhibition room:

4.2.3.1 The viewing area within the exhibition room was separated into 3 routes (Figure 48). On the 1st route, the audience would start viewing the exhibition shelves around the room anti-clockwise, and walk over to observe the ancient artifacts demonstrated in the center and to the left of the room. This particular route was mostly caused by walking to follow guidance or explanations of a guide. On the 2nd route, the patrons would start viewing the ancient artifact demonstrated in the center of the room, and then proceed to walk around the room anti-clockwise or clockwise. For the 3rd route, it would be a more freestyle route, depending upon the patrons' satisfaction, when choosing to view only those contents that matched their interests; making it difficult to map a clear route.

4.2.3.2 The proportions of the exhibition room Which the researcher completed fieldwork to collect data concerning the room sizes and available spaces (Figure 55) that could be used for designing and creating exhibitions; as well as measuring the original area to prepare analytical information of the area, which would affect the designs and the settings of equipment. The researcher collected such data in form of U-Thong Sri Dvaravati’s room plans.
4.2.4 Audience Behavior

Based upon observation of visitors who visited the U-Thong Sri Dvaravati room in U-Thong National Museum, it appeared the audiences comprised different groups of people, as well as different age ranges. However, they could be
categorized into 2 majority groups\(^\text{10}\): educational visiting groups; a group of primary, secondary and tertiary students. This group was usually made up of 50 students per group. For this group visit, there would be prior contact made, thus allowing the museum to be able to plan the visiting route led by a guide, who would initially explain the overall contents for basic understanding, before the group was taken to see the actual ancient artifacts (Diagram 21).

Diagram 21 Diagram of the visitor’s general information and interests of U-Thong Sri Dvaravati room.

Looking at the artifacts, the guide would explain the significance, one by one. However, because this group primarily consisted of children and university students, it could get slightly chaotic during the visit. Some children would be too focused on photographing themselves with friends. Also, for this particular group, if a teacher or a lecturer assigned a report on this visit, it would result in students being

\(^{10}\)An analysis made on observation and from the surveys, took the duration of 30 days to conduct surveys randomly, in the U-Thong Sri Dvaravati Room, U-Thong National Museum.
especially interested in taking notes and listening to lectures from the guide; as well as photographing antique artifacts to use them for their assignment.

The second group comprised the general public, be it tourists or families. The majority of this group was made of 3-5 individuals, and most of their visit would take 10–15 minutes; characterized by a stroll taken to view the artifacts. Some patrons would take photographs, or make enquiries with the room’s officers occasionally. Most of the patrons prioritized larger antique artifacts over smaller ones.

Apart from the visitor observations, the researcher also studied the details of patrons who participated in surveys, in order to know more in-depth details. The general information concerned the majority of visitors, their interests, their acknowledgements, communications conducted in the museum, and personal suggestions of patrons. The results display that the majority of patrons were male, rather than female.

Most of the patrons were within the age range of 12-25 years old, and 30-39 years old. As for occupations, the largest majority were still students and university students, who fitted into the age range of 12-25 years old; followed by employees of private sectors, whose age range would be 30-39 years old. From the research concerning the level of education completed, it was revealed that the majority of visitors hold an undergraduate degree, with the second being degree graduates. This information is consistent with the statistics of visiting objectives; to seek knowledge and for entertainment, ranked respectively.

Most of the patrons were not local individuals. The survey reveals that patrons lived in: Bangkok and Nonthaburi, Kanchanaburi, Samut Sakorn, Nakhon Sawan, Lopburi, Pijitra, Ubon Ratchathani, Chiang Rai, Chachoengsao, Nakhon Pathom, Uttaradit, Ayutthaya and Rayong. These individuals may not be only students seeking knowledge; it may refer to those who are employees of private sectors, visiting for entertainment purposes. One could even call them “Tourists”, because

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11 From the surveys using 30 days duration to conduct random selections; and could read details of additional analysis from the indexes.

12 Local individuals refer to those living in Suphanburi province.
for this particular time it was the first visit by these patrons. Additionally, the majority visited other museums only once or twice a year, or never.

The majority of the patrons came to know about U-Thong National Museum from suggestions and websites, such as Google search engines, tourism websites of Suphanburi province, and almost all patrons had heard of the term “the ancient city of U-Thong” or “Dvaravati culture” before.

General research, by conducting surveys of patrons, demonstrated that the visitors could be categorized into 2 major groups, fitting with analysis obtained from the observation, which are: the 1st group; students and university students who came for educational purposes, and the 2nd group; general tourists who, apart from knowledge, seek enjoyment as well. Both groups of patrons may be considered as intellectuals.

4.2.5 Summary

U-Thong National Museum is important to Thailand’s history, as it is a museum that collected content, information and antique artifacts; as if it was the representative of Thailand’s origin, and it also demonstrated the dissemination of Buddhism into Thailand for the first time, as well as the initiation of art works, recognized by the notable beauty of ancient artifacts and detailed craftsmanship. Each artifact can illustrate the previous lifestyles of Thai predecessors, many norms and beliefs, and occupations and trades very well. U-Thong National Museum is also regarded as a place where the locals are proud of their hometown, on land that is filled with stories of valuable, historical, psychological causes of love and jealousy. When the villagers spotted beads or artifacts they would bring such to the museum to become a national treasure, without ever a thought of keeping such for private use.\(^\text{13}\)

The exhibition was arranged by positioning the ancient artifacts on shelves or presenting them in the room. As such, there was not much information available at the exhibition. This is because of the limited space, and because there were many artifacts for decoration purposes. Some, with a lot of information, would have their information noted down separately in the guidebook. However, only a small group of patrons actually read additional information from the guidebook.

\(^\text{13}\) Interview with Puncharat Chaengsook, Assistant Director of U-Thong National Museum, August 22, 2012.
Within the room, it was rather quiet. There were only ancient artifacts and informational plates. Because of these, children, non-archaeologists, or non-historians could become bored and neglect to prioritize studying the information provided.

The most interesting points (Diagram 22) of U-Thong Sri Dvaravati room are: 1) The overall atmosphere of U-Thong Sri Dvaravati 8%, 2) The officers’ service 10%, 3) The presentation and the content presented 12%, 4) Dvaravati culture and the ancient city of U-Thong 23%, 5) Ancient artifacts exhibited 45%, and 6) Others 2% are: hope for the exhibition to be more exciting, hope that U-Thong Sri Dvaravati will improve accordingly (Diagram 23): 1) In terms of service for additional research of information 6%, 2) In terms of guiding services 17%, 3) In terms of content presented 22%, 4) In terms of location/atmosphere 20%, 5) In terms of presentation 26%, and 6) Others 9% are: improving of the quiet and lonely atmosphere, as well as the guides.

![Diagram 22 The most interesting points of the U-Thong Sri Dvaravati room’s visitors](image-url)
From the survey analysis, the researcher researched the interests and acknowledgements of patrons, and communication within the U-Thong Sri Dvaravati room. From the survey conducted, patrons all admired the ancient artifacts exhibited. The artifacts were exceptionally interesting, especially the large artifacts presented in the center of the room: the Dharmachakra and the Buddha statue. The second most interesting thing was the story of Dvaravati culture and U-Thong ancient city. The majority of the visitors’ hope, if there is an opportunity, to come back and visit again. However, even though the exhibition was categorized appropriately, allowing adequate absorption of information, there is still room for improvement concerning the presentation. The presenting media, as well as the services provided for additional research, should both be improved.

The researcher enquired about bringing in interactive media to use in the presentation. From the survey, it appears that all patrons agree with bringing in multimedia technology to assist in the presentation. A few audiences offered personal opinions: the information provided within the exhibition is quite limited, and there was not enough. There should be guides explaining details and backgrounds of the artifacts, so that visitors may take in information. They also hope for new information and a presentation of information in a different aspect.

Diagram 23 The visitors hope that the U-Thong Sri Dvaravati room should be improve

From the surveys, with a duration of 30 days for random selection; the additional analysis is provided in the index.
In terms of presentation, many patrons thought that the room did not have enough lighting and was too quiet. No matter how valuable or interesting the ancient artifacts are, the presentation method should be improved to be more stimulating, thought provoking and creativity inducing; especially in the case of children, there is a critical need for improvement.

The introduction of multimedia or interactive media would not only help the presentation, but would also make it more interesting and easier for associated information to be conveyed. As such, from the analysis made from the patron surveys, the research can conclude that the U-Thong Sri Dvaravati room of U-Thong National Museum should be improved in terms of presentation media, in order to make it more interesting. This is consistent with the concept that the researcher studies. That is, bringing in interactive media would help in the capacity to convey messages, in cooperation with a beautiful and interesting exhibition of valuable artifacts.

Figure 56  Atmosphere of the experiment in Zone 1, at the front of the U-Thong Sri Dvaravati Room
4.3 Field Experiments of Contents/Techniques/Space in the U-Thong Sri Dvaravati Room

4.3.1 Zone 1: Entrance Section (Figure 56)

The researcher made an attempt to find a presentation approach which would attract visitors and make them interested in entering the U-Thong Sri Dvaravati Room, since it was the first zone that would create stimulation in viewing. The researcher therefore had to give a presentation in a way that made visitors feel interested in the exhibition, understand the feelings of the atmosphere which had been created, and learn about the contents which was communicated through stories in the exhibition room.

The researcher analyzed 4 alternatives for the design of the media presentation, which were: a mirage sticker, a kiosk to display detail and contents, a sand cabinet to display the logo of the exhibition, and the projection of moving images on top of the entrance beam. Afterwards, the researcher conducted an experiment by creating different types of design according to such concepts, starting from the search for data and the experiment of creating simulations via a computer program, in order to consider the possibilities and their suitability.

After the analysis, the researcher concluded that the 4th approach, which was the projection of moving images on top of the entrance beam, would be the best way to attract visitor interest and communicate the contents in accordance with the objectives.

Next, before entering the field, the designer conducted another experiment by projecting graphic images onto a white wall, which tended to provide sufficiently clear and quality images for viewing. However, the experiment had to be done at the real location, since there might be the factor of surrounding lights involved. During the experiment at the actual location, the researcher tried projecting images onto the beam from different directions. The results of the experiment demonstrated that the most appropriate direction was to set up the projector on the beam of the room on the opposite side, at an angle of 90 degrees.

Still, there was a problem concerning the non-continuous display of images, due to the characteristics of the protruding beam, which caused unleveled depth and, as a result, refracted images. Nevertheless, the issue could be solved by stretching a piece of cloth upward from the beam. The projected images would be
displayed on this cloth instead of the wall, which would allow the images to be projected more clearly at the same level.

The installation of the projector on the beam of the room on the opposite side not only provided a satisfactory result, regarding the angle of projection which matched the area of the displayed images, but it also benefited the projector’s operation, since the airy atmosphere would allow the projector to ventilate and control its heat more efficiently. Even though there was a problem with the lighting of the projection, since the outside of the room was quite bright, the issue could be solved by the use of a quality projector with high definition, making it possible to control the brightness and clarity of the images. In addition, the researcher projected images onto the ceiling which surrounded the door’s beam, to create a better atmosphere for viewing.

An experiment was made to test the efficiency of the projector and the installation point of the display, which were considered important. Moreover, the researcher further developed the design to allow viewers to participate in the viewing, by using the webcam’s motion capture technique to catch the waving of their hands, which would simultaneously interact with the moving graphic images. In order to do so, the experiment had to be conducted to measure the webcam’s position of motion capture, in order to determine the appropriate distance to where the waving of viewers’ hands and their standing points could optimally affect the appearance of images above the beam, and for the easiest play and most convenient usage.
4.3.2 Zone 2: Introduction Section (Figure 57)

Originally, the atmosphere inside the room was quiet. Therefore, the researcher wished to create a more interesting, refreshing and relaxing atmosphere for viewing. Such feelings should be continued from Zone 1 into Zone 2.

Thus, the researcher started by analyzing 3 alternative approaches to the design of media for presentation. The first approach was to project moving graphic images of soil or rocks onto the floor when viewers walked in, to create a feeling which resembled entering into areas of artifact excavation.

The second approach was to project moving graphic images of leaves falling onto the ground, and to add extra tactics for viewers with interactive media which made leaves flutter when viewers walked by, resembling a walk in the forest, with leaves falling down and fluttering all the time. This approach needed a technique to capture viewers’ motions.

The third approach was to enhance the atmosphere by adding a sense of smell, followed by a sense of vision, which allowed viewers to notice the surrounding atmosphere in the room when the moving graphic images were
projected onto the wall. Before entering this field, the researcher had to study smells which conveyed the meaning that corresponded with the contents and created a feeling of relaxation. In addition, the researcher tried emitting a smell while projecting the images used in the experiment of concepts 1 and 2. According to the experiment in the real location, according to concepts 1 and 2, there was a problem regarding unclear images, because the distance between the spot where the projector could be installed and the display area was too far. Besides, the images which were projected in the area were disturbed by reflections from the shiny floor tiles, causing the images to lack strength and clarity that would stimulate attention. As for concept 3, the creation of an atmosphere using smell tended to have a good possibility, because it changed the room’s atmosphere with an odor that was connected to the contents of the presentation in the exhibition room. Additional moving images with the same contents could also be applied.

Hence, according to this field experiment, the researcher was able to make a conclusion by choosing the third approach, because it could stimulate 2 senses when viewing: vision and olfaction. Afterwards, the researcher also considered the natural order of viewing and the behavior of viewers, by installing an odor-emitting machine in front of the room, so that viewers could detect the smell first. Then, they would walk into the room and might stop to breathe in, wondering about the origin of the smell and rechecking whether the smell was really there. The next step was the appearance of moving graphic images around the room made by sensors. Therefore, at this point, viewers would be able to perceive through their senses that were stimulated simultaneously, or they could imagine and feel more.
4.3.3 Zone 3: The Chedi Model Section (Figure 58)

The Chedi model was created to reflect the flourishing of religion, art and culture of the ancient peoples. Apart from beauty, the Chedi model was used to illustrate the discovery of ancient artifacts which were displayed in the U-Thong Sri Dvaravati Room. The researcher wished to extend the meaning of the contents regarding the stories about the discovery of ancient artifacts onto the Chedi model, by projecting mapped moving images onto it.

The experiment began with the measurement of the width, length and height of the Chedi model in detail, in order to create a paper mockup. In this experiment, the researcher needed to work with the real Chedi model, in order to analyze the approaches to the design of the interactive media which would facilitate such presentation.

However, due to a problem with distance, which made it impossible to travel there for the experiment every time, the researcher had to create a paper mockup to be used outside the real location. Therefore, the experiment was
conducted using the projector to project moving images on a Chedi paper mockup, before entering the field once more.

During the field experiment, the researcher measured the proportions of the Chedi model, to determine the position of the moving images in the file or the computer program, in order to project images that matched the size of the real Chedi model. Another thing that had to be considered was the sharpness and the right proportions of the projected images onto the Chedi model.

Thus, it was important to specify the distance and the position of the projector installation. In this experiment, the researcher had 2 alternative positions for the projection: the projector could project from the top of the Chedi model or from the front of the Chedi model, and then adjustment was made to the distance of projection at 45 degrees, in order to project vertically onto an acrylic plate which would then reflect onto the Chedi model itself. To do so, the focal point of the clearest position of the images that were reflected onto the Chedi model had to be specified.

According to the results of the research, the researcher decided to choose projection from the top of the Chedi model, because the experiment on the projection from the front of the Chedi model showed that the area on the Chedi could only support small images. Therefore, the images that appeared were small, and thus could not clearly communicate the contents. Apart from the projection from the top, the researcher also searched for an approach to make the image display more interesting and more realistic, by applying holography to the presentation, i.e. to project 3-dimensional images using the principles of angle refraction, which produced 3-D images on 3 sides of the model.

The results showed that there was not only enough space for the presentation, but the contents could also be clearly narrated. Additionally, the atmosphere of viewing became even more interesting.

4.3.4 Zone 4: The Buddha Image Section (Figure 59)

For the experiment in the “Buddha Image Section”, the researcher started by analyzing several aspects including histories, places of discovery and the importance of Buddha images, in order to find different approaches to presentation. The overall idea for the design was to create an atmosphere which allowed visitors to feel the involvement through their belief from the projection of Buddha’s
biography on the Buddha image, as well as the projection of light which gradually appeared as a radius.

![Figure 59 The experiment in Zone 4: the Buddha image in the U-Thong Sri Dvaravati Room](image)

During the field experiment, the researcher collected detailed data regarding the proportions, in order to create a mockup. Also, the experiment was done by projection onto 4 spots. The first spot was to project images onto the body of the Buddha image. The second spot was to project images onto the floor, in front of the Buddha image. The third spot was to project from the bricks around the front base of the Buddha image, and the fourth spot was to project from the bricks around the back of the base of the Buddha image. From the fourth spot, the projection was aimed towards the ceiling above the Buddha image. During the experiment, there were some people visiting the original exhibition in the U-Thong Sri Dvaravati Room, and according to George E. Hein stated that visitor studies are carried out because we are interested in finding out what visitors think and how they feel about their visits. In addition, the researcher noticed that some visitors paid respect to the Buddha image faithfully, by prostrating and touching the image, which showed their belief in that zone.

Therefore, the researcher analyzed the options and concluded that concept 1 and 2 should be cancelled, since they might appear inappropriate for Buddhists who had belief, faith, culture and traditions. Thus, the researcher considered

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the other 2 alternatives, which were to project moving images from the bricks around the Buddha image’s front or back base. Further experimentation revealed that the projection from the back would be obstructed by the top part of the Buddha image, because the image slightly leaned backwards. Furthermore, to move the projector away would make the installation difficult, and would also affect other zones.

According to this conclusion, the researcher decided to choose projection from the front of the base, by projecting towards the ceiling to match the square space, which was designed for the electrical system in the original exhibition room. Since the Buddha image was tall, and viewers mostly looked upwards, the researcher further developed the idea of viewing to increase viewer participation.

The original concept was that when viewers approached the Buddha image, the images would be projected towards the ceiling. Now, the researcher planned viewing in the sitting position, akin to when viewers pay respect to the Buddha image, by adding a carpet or a seat in front of the Buddha image. Then, the sensor system was installed on 5 spots underneath the carpet, to control the computer’s functioning. Therefore, when someone came to sit on the carpet, the moving images would be projected onto the ceiling. However, the projection position had to be moved towards the front, so that the angle of projection could provide the clearest and most beautiful proportions.

Figure 60 The experiment in Zone 5: The Dhamachkra Section in the U-Thong Sri Dvaravati Room
Zone 5: The Dhamachkra Section was an important zone of the room, with quite a lot of space. This zone comprised 2 pieces of Dhamachkra, including the base and the pole, which were considered the most important, most complete artifacts found in Thailand. Dhamachkra is considered to be the emblem of Buddhism. According to analysis of contents and area, the researcher wished to make the most of this zone, and attract the attention and participation of viewers. Hence, the researcher analyzed and searched for concepts which would allow the display in this zone to narrate more stories, or present more information about Dhamachkra.

The experiment of concept 1 was completed using the techniques of hanging cloth and the projection of moving images, in order to create an atmosphere for the narration. The researcher started by sketching a draft using a computer program. The brief pattern was to suspend white cloth around the ceiling and let its streaks hang down. Then, the stories would be projected onto the cloth. When viewers walked near Dhamachkra, moving images and sound would appear, and viewers could listen from an earpiece that was previously provided. The layout in the computer program had good tendencies and possibilities. Yet the projection had to be tested in the real location, to see if it was feasible or not.

Therefore, the researcher studied further to acquire additional information, in order to find more alternatives for the design. The researcher wanted to make viewers participate in the viewing, rather than to simply watch the stories from the projections. This concept derived from the Dhamachkra section, which was connected to various Buddhist principles. Therefore, the researcher had the idea to design this zone into a place where visitors could understand the contents and gain knowledge through their participation in the activities. Thus, the second concept was to make viewers walk in a circle, which is a part of Dharma practice. As they walk, the light will appear under their feet. According to the field experiments of concept 1, with the suspension of white cloth from the ceiling, it was discovered that the projected images on the cloth in the middle of the room were not very clear, because the projector’s position was very far away, resulting in overlapping light. Also, the analysis revealed problems which might occur in the installation process, which was too complicated and might affect the original area.
Consequently, the researcher chose to make an experiment pertaining to concept 2; a walk in a circle, in the next step. According to the area analysis, the empty space in the middle of the room had a tendency to become the base for the building of a path for a circular walk. The space was also ample enough for viewer’s to walk as in the Dharma practice. Afterwards, the researcher tried calculating the walk around the area, in order to count the number of footsteps for the design. Then, the design and the functioning of the light system, when someone walked on the floor, were tested by creating footprints which would light up when someone stepped on them. The results of the experiment showed that the system worked well. Therefore, according to this experiment, concept 2 was selected to be developed, since the results of the experiment revealed great possibilities. Additionally, this concept could create an activity which enables viewer participation, while the contents and the gaining of knowledge are simultaneously introduced, creating recognition and feelings of such among the viewers. Moreover, the researcher further developed this zone by adding not only light, but also the sound of footsteps. Besides, more information about Dhamachakra, its contents and the knowledge of the circular walk were added. Viewers were able to listen to such contents via an earpiece, both in Thai and in English, depending upon their needs.

Figure 61  The experiment in Zone 6 with artifacts inside the cabinets, and 6 artifacts on display in the U-Thong Sri Dvaravati Room
4.3.6 Zone 6: Cabinet Section (Figure 61)

Zone 6, with artifacts inside cabinets and 6 artifacts on display outside, was the zone which surrounded the exhibition room. This zone comprised small-sized artifacts which were categorized by type, and placed in 11 cabinets. There were also 6 medium-sized artifacts which could not be put into the cabinets, and were therefore on display outside. According to the data analysis, the observations and interviews, the thing that was still missing in this zone was viewer access to the artifact data, since the original exhibition provided limited contents or explanations simply on graphic boards. If viewers wanted extra information, they had to read the viewing manual in front of the exhibition room, or ask the staff members. However, most viewers neither liked to ask nor read from books.

Thus, the researcher began by analyzing the existing information about the artifacts. In order to provide more information for viewers, both in terms of contents and viewing methods, the researcher collected more data from various sources, including the acquisition of information from staff members and keepers of the museum, in order to make a conclusion regarding the contents that should be added before entering the field, and to find a suitable technique and method of presentation. According to the analysis, the researcher came up with 2 approaches to presentation. In the first approach, additional information could lead to infographics, which would help to conclude data and allow viewers to understand the contents more easily. The second approach was to present by creating a ‘Microsite’ for data which enabled viewers to gain more information about the artifacts during their visit. Next, the researcher entered the real location to analyze the presentation using both alternatives. The results demonstrated that the first approach, the acquisition of information from infographics, required the installation of infographics near every cabinet. The method of viewing was to read the data. Since the analysis of the solution, according to the objectives of this zone, was to add more information and allow viewers to access the data in the easiest manner, the installation of infographics near the cabinets might not be interesting. If the infographics were placed in front of the cabinets, they would obstruct viewing. Furthermore, the building of boards next to the cabinets for infographics was inappropriate, because the limited space in the room was not enough for the installation of boards at suitable spots.
Later, the researcher considered the second option, the creation of a “microsite” which was connected to an online database that viewers could access in order to study additional information according to their interests, whilst simultaneously viewing the real artifacts. According to the analysis, most viewers use smart phones or tablets, which enable them to go online immediately. In case that they did not have any device, the museum could provide such for temporary viewing. In addition, the museum needed to provide an internet signal which allowed fast viewing by many devices at the same time. According to the analysis of the second alternative’s possibilities, the researcher decided to choose this approach, since it was suitable for the presentation and the lifestyle of the people at present.

For easy viewing, viewers could scan a QR Code. At first, the researcher tried to find suitable positions for the installation, perhaps by creating bases near the cabinets or acrylic plates as supporting bases in front of the cabinets. However, the area analysis showed that to do so might obstruct the viewing of artifacts in detail inside the cabinets. In conclusion, the researcher considered that the installation should be made in front of the glass of the existing cabinets, but in positions which would not obstruct the artifacts and made it easy for viewers to scan the QR Code. Other things that had to be considered were the background that would appear on the QR Code, the height of viewers’ use, as well as minor and major experiments concerning the convenient use of a QR Code.
4.3.7 The conclusion of field experiments to prepare the “Walk Though” to present the overall picture of the design.

The important thing for the field experiments of the contents and techniques in each zone was that the researcher had to dedicate time and attempt the field experiments, in order to analyze the approaches to design the appropriate media for each zone. It was necessary to conduct experiments to find the most suitable alternatives under related factors, such as the existing contents, the patterns or sizes of artifacts, the environment of the area inside the exhibition room, interesting presentation methods which stimulate viewing, the creation of viewer participation for better understanding, as well as the budget for all necessary equipment. The presentation that the researcher was about to create, using various interactive media, had to be able to preserve the artifacts’ eminence and value, and not to disturb them. Also, it was important for each section of the newly-created exhibition not to affect or disturb one another in terms of area, lighting and sound. Still, there had to be a continuation of the overall presentation of the contents, the participation of viewers, as well as the mood and tone of the exhibition. In this step,
the researcher created moving images as a simulation of situations, to present the overall picture, by preparing the model in a “Walk Through” style, which was the use of moving graphic images for the presentation to resemble a real exhibition as much as possible. This could be in the form of pictures or VDO’s, as could be seen in the examples of all 6 zones that the researcher created - from Zone 1 to Zone 6. Finally, the researcher prepared a VDO presentation (Figure 62) to conclude the methods of viewing, the participation, the contents on display, the general picture and the mood and tone of the exhibition.

4.4 Chapter Summary

U-Thong National Museum is one of the most important places for Thai history, since the museum displays artifacts from the Dvaravati period which is believed to be of great significance for the Suvarnabhumi region. This area used to be the trade center of the world, with a lot of commercial exchanges with foreigners. Therefore, the region was influenced by foreign countries, in terms of: art, culture, beliefs and languages, which were adopted. Also, it was the start of the propagation of Buddhism in Thailand. Having realized the importance and the historical value of this region, the researcher is inspired to study and distribute its stories, so that tourists and people in general, both inside and outside the area, realize its historical value. Also, the researcher was born and has been living in U-Thong District, Suphanburi Province. Therefore, this piece of work is also a way to express gratitude to the researcher’s hometown. Throughout the period of study in U-Thong National Museum, the researcher was kindly welcomed and the museum’s director and staff members from all departments fully cooperated. Thus, the working atmosphere was full of warmth and friendliness.

The important thing concerning this study is the field study itself, which is to find the best presentation approaches with the use of interactive media technologies for the display of artifacts, in order to create viewer participation and for them to gain learning and knowledge. At this time, the researcher chose the U-Thong Sri Dvaravati Room as a case study. The study started from an analysis of existing exhibitions in the U-Thong Sri Dvaravati Room, and the analysis of contents, areas, proportions and electrical systems used in the U-Thong Sri Dvaravati Room, as well as the analysis of viewers’ characteristics and behaviors, in order to reach a conclusion about the problems and the solutions through the use of the design of an exhibition. As for the design and experiments, the researcher started by
determining the spaces available, as well as fundamental subject matter and contents of the exhibition.

The structures of the participation or reactions were determined. Also planned was the installation of equipment, such as a projector and sensor system, as well as their display in the actual area, which led to field experiments of contents and techniques in the real location, inside the U-Thong Sri Dvaravati Room itself. According to the analysis, the researcher divided the exhibition area into 6 zones, which were: Zone 1; The Entrance Section, Zone 2; The Introduction Section, Zone 3; The Chedi Model Section, Zone 4; The Buddha Image Section, Zone 5; The Dhamachakra Section, and Zone 6; Artifacts inside cabinets and 6 artifacts on display outside. Afterwards, the researcher made a conclusion and prepared a “Walk Through”, in order to determine the overall picture of the whole design, according to the experiment objectives; to enhance the atmosphere, to provide new experiences with concentration upon viewers’ participation, and to allow viewers to perceive and have feelings toward the artifacts and the contents on display.
Chapter 5
The Prototype Exhibition at U-Thong National Museum

5.1 The Replay Exhibition Design Concept

5.1.1 Introduction

“Replay: U-Thong Sri Dvaravati” is an exhibition which presents retrospective concepts to bring artifacts to life by further developing the original contents, the exhibition and the environment, and retelling them in a more interesting and lively way. In the new exhibition (Figure 63), a process which combines modern presentation technologies is presented with an emphasis on mutual experience between the audiences and the artifacts from the Dvaravati Era, found in ancient U-Thong thousands of years ago. Those artifacts represent the cultural prosperity in that period and the way of life that went alongside Buddha’s teachings, in which value equals gold shining all over the ancient city of U-Thong, and as displayed in the U-Thong Sri Dvaravati Room, at the U-Thong National Museum in Suphanburi Province. This exhibition is the creation of new experiences when viewing the museum. The import of new technologies into the exhibition places major emphasis on the presentation of contents and artefacts.

Figure 63 The opening atmosphere of “The Replay: U-Thong Sri Dvaravati” exhibition at U-Thong National Museum in Suphanburi Province

1 Srisak Vallipodom, Historical Archaeology: U-Thong City (Bangkok: the ancient city, 2549), 151.
2 The President of exhibition opening by Mr. Verasak Vichitsangri, Deputy Governor of Suphanburi Province.
5.1.2 Design Concept

The exhibition is the presentation of a case study for research, from which the contents can be applied to the creation and development of the exhibition appropriately. Besides, “The Replay Model Concept” can be used as an approach for exhibitions in other museums as well. In this research, the researcher’s design concept is “Golden light illuminating the U-Thong civilization”, which represents the light of prosperity, in terms of art, culture and the way of life of the people who lived in the ancient city of U-Thong in the Dvaravati Era. Moreover, the concept had apply to logo were used for the design of printing media including the souvenirs from the exhibition and digital media regarding the contents which were displayed together with the artifacts as well as PR media, both printing and digital ones.

Figure 64 The design of the logo “Yon-ma-lao” for The Replay: U-Thong Sri Dvaravati exhibition

Figure 65 The examples of printing media and souvenir design for the Replay: U-Thong Sri Dvaravati

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5.1.3 Zoning Plan and Circulation

5.1.3.1 Zoning Plan

Regarding the zoning of the exhibition “The Replay”, the researcher divided the exhibition into 6 zones according to the analysis of the original exhibit space for the design. The contents which would be presented were in accordance with the old contents that had been on display in each zone. However, the contents were further developed in terms of detail and method of presentation, in order to create better understanding and greater interest among the audiences. Then, each zone was named using keywords according to “The Replay” concept, which consists of 6 zones as follow: Zone 1; Discovery for the Replay, Zone 2; The Culture Odor, Zone 3; The Story of U-Thong, Zone 4; The Buddha’s first Sermon, Zone 5; Knowing Consciousness, and Zone 6; Remind the Children.

Figure 66 The circulation of “The Replay: U-Thong Sri Dvaravati exhibition

5.1.3.2 Circulation

As for the circulation of the exhibition in each zone, the audiences should follow the proper order of viewing, which is from Zone 1 to Zone 6 respectively, as displayed in the picture. To make sure that the audiences will circulate in the right direction, the audiences may need a guide (Figure 66) or an infographics’ banner which is designed to display the order and methods of viewing.

An infographic is a type of picture that blends data with design, helping individuals and organizations to concisely communicate messages to their audiences. See Mark Smicklas, The power of infographics (Indianapolis: Que Publishing, 2012), 3-4.
as well as arrows which point towards the areas that require the audiences’ attention, accordingly. Such a design could also be created in the form of a manual for viewing the exhibition. Even though the viewing circulation of this exhibition does not need to follow the order from 1 to 6, and the audiences can walk as they desire, the audiences may not be able to feel the atmosphere of the exhibition as much as the researcher has planned. This is because Zone 1 and Zone 2 are the areas which build up the feeling and the perception of the exhibition’s atmosphere, before entering other zones.

Figure 67 A diagram of the story categorization in all 6 zones of the exhibition

5.1.4 The Story of U-Thong Sri Dvaravati

The researcher analyzed the original contents in order to create a diagram to display the categories of the stories in all 6 zones of the exhibition (Figure
The narration starts from Zone 1 to Zone 6, and the contents correspond to one another as a circle, resulting in an interesting learning dimension. The story has been designed based upon the original structure of the exhibition in this room, and the contents have been arranged from 1–6, as follow:

Zone 1 narrates the story of how Buddhism entered the U-thong territory via artworks in the Dvaravati Era, by retelling the past using a narrative method which is in accordance with the period under the name of “The Replay: U-Thong Sri Dvaravati.” The contents are communicated through the works which have been created, reminding people of the glorious past.

Zone 2 allows the audiences to see the major artifacts on display in the room, and feel the prosperity of the U-thong realm. Together with the works that the researcher has created to reflect the value, the beauty and the luminosity of Dhamma, as well as the odor which changes the atmosphere, it makes the audiences feel as if they enter into the U-thong territory full of Dvaravati art once more.

Zone 3 introduces the story, which has been produced based upon the historical evidences that mention archaeological sites in the stories of faith and delicacy of craftsmanship, by creating a model of which the contents are concerned with the locations of discovery. The researcher has further developed this model so that it can tell such stories more by itself.

Zone 4 consists of a large-sized, important artifact which is displayed in the middle of the room. When the audiences enter the room, they will see an elegant Buddha statue which makes every audience walk towards the image to pay respect, resembling the participation in The Buddha’s first sermon. The audiences are able to feel strong faith from the researcher’s work, which reminds them of The Buddha’s enlightenment, allowing them to develop awareness and concentration.

Zone 5 presents an important artifact which is akin to a representation of Buddhism. The Buddhist teachings which lead to Buddhist practice generate awareness, concentration and the use of Dhamma in people’s lives at all periods.

Finally, in Zone 6, the remnants from each era are stories which have been superimposed onto the archaeological evidence, beliefs, faith, values, art, languages and dressing styles. These ways of living are recorded for the next generations to study, in order to find an accurate and suitable living approach, as well as to realize the value of their mother land.
The contents are used for the creation of media which further assist the presentation, in order to create the experience and generate more recognition, learning and feelings which can be related to the contents on display.

5.1.5 Summary

Regarding the concept of the design of the exhibition, the researcher will summarize the design approach, starting from the concept and theme design for the exhibition. The next step is the determination of the framework of the exhibition’s contents, followed by the design for the audiences’ participation in each zone, using interactive media technologies. Afterwards, the areas of the exhibition are determined and designed, while the digital content design of each zone is arranged.

The researcher will determine these things for simplicity and clarity, while operating according to the major framework, which can make every aspect of the exhibition’s overall picture head in the same direction, including the atmosphere caused by images, lights, colors and sounds. Therefore, this step is considered to be essential before the creation of work in every other zone.

5.2 The Development and Installations

This step is the development of the presentation concept, which also extends to the circuit techniques and the installation process in the real location, which requires cooperation with various departments, including electricians and carpenters. There might also be some slight modifications or alterations to equipment, in order to produce the desirable results as planned.

5.2.1 Zone 1: Discovery for the Replay

5.2.1.1 Design Concept

Zone 1: Originally, the atmosphere of the area in front of the U-Thong Sri Dvaravati Room was the entrance, with a description which explained the contents and details about the U-thong Empire and the Dvaravati Era on the wall, in front of the room. Mostly, the audiences would not read or pay very much attention to this description. Thus, to create a welcoming atmosphere, to enhance learning and to stimulate the audiences’ interests, as well as to provide basic information for better perception of the contents in the exhibition room, the researcher designed a simulated atmosphere in the front area, before reaching the
entrance to the U-Thong Sri Dvaravati room, by projecting golden light towards the ceiling and showing a motion picture of Sala flowers continuously falling down.

Such design indicates that the audiences already stand over a place which is filled with religious faith, since Sala flowers are directly connected to The Buddha’s life story regarding his birth, his enlightenment and the total extinction of The Buddha. Afterwards, when the audiences stand in front of the entrance and wave their hands to brush away Sala flowers which are hanging from the door’s beam, such action will make the picture of Sala flowers fall and disappear.

Then, Sala flowers will continually fall down. If the audiences brush away Sala flowers which have been hanging for about 1 minute, the logo of the exhibition “ย้อนมาเล่า: ย้อนมาเล่า” next appears. All of these techniques not only create an atmosphere to make the audiences feel luminous glory, but the audiences’ participation in the viewing made possible by the interactive media, can also add more interest and fun for the audiences. In addition, such media are capable of stimulating and attracting the audiences into the viewing of different zones in the exhibition.

Figure 68 The digital content design used in Zone 1: Discovery for the Replay

5.2.1.2 Digital Content Design

The researcher chose a picture of Sala flowers as the graphical outlay, because it suggests the arrival at an area of Buddhist atmosphere
and stories. Therefore, the researcher created the stories and contents in a sequence, by letting the audiences participate in the exploration of contents in this zone in successive order. First, the image of shining golden light appears on cloth which is stretched above the door, and Sala flowers fall down slowly and continuously onto the door’s beam. When the audiences arrive at the door and wave their hands, the images of Sala flowers which have been hanging on the door’s beam above will slowly fall down and disappear. After the Sala flowers have been brushed away, after about 1 minute, the logo of the exhibition will appear and slowly fade away. After that, the same process restarts (Figure 68).

5.2.1.3 Development and Installation

The major principle of the narrative zone is controlled by motion captured by a webcam during the audiences’ participation. The development and installation can be divided into 4 parts, as follow:

a. Regarding the contents, the building of the contents in Zone 1 has emphasis placed on the creation of beautiful and communicative motion graphics. First, the contents structures from the writings on a storyboard were determined to fix the movement position. Then, the motion graphics were created using a computer program, followed by an experiment in the real location with amendments to make it suitable for using in the real position.

b. The program co-worked between motion graphics and coding, by preparing to separate files for the background / background animation / object. The next step was the creation of motion detection using a ‘Flash’ program co-working between the webcam and the sensor to capture motion. The viewing was the display of motion graphics via the Flash program based upon the case study of ‘Flash 8 Web beam Snowstorm’, by Grant Skinner. The principle that was applied was for hand waving at in a certain position makes the flowers fall down and stop at the beam above.

c. The hardware consisted of 1 projector, 1 webcam and 1 computer.

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d. The important thing involved in the installation principle is that when the audiences come to play with (view) the motion graphics, the position of the webcam installation must be able to clearly detect the audiences’ movement, and the position of the projection must not be obstructed by any other object. In this process, the stretched cloth must be prepared for the receipt of images from the projector (Figure 69). Also, the position of the projector installation must have enough space for cooling. After installation, the experiment must be
conducted to find the most suitable position for the hand waving of the audiences, in order to determine the best viewing position (Figure 70).

5.2.1.4 The Atmosphere in the Exhibition

Zone 1: ‘Discover for the Replay’ is the first zone of the exhibition (Figure 71). Some audiences might be surprised by the use of interactive media for the presentation in a museum that displays artifacts like this. Therefore, it was necessary to provide staff members or guides who could give advice or hand out manuals for viewing, so that the audiences could understand the presentation and the guides could give a brief explanation of the contents of the exhibition. Thus, this zone not only stimulated the audiences’ interest in the presentation in the exhibition room, but it was also an opportunity to introduce the overall picture of the exhibition.

5.2.1.5 Suggestions

One important factor is the selection of an installation spot which is not obstructed by the players, and an experiment to find the most suitable position for the projection, which depends upon the areas of exhibition in different locations. Also, the viewing position must be clearly identified, so that the audiences, both children and adults, can brush away Sala flowers more easily. As for the
maintenance management, the system must be turned off every 2-4 hours to give the machine a rest, and to cool down the projector. In addition, the stability of the software must be checked every time it is activated.

5.2.2 Zone 2: The Culture Odor

5.2.2.1 Design Concept

Zone 2 is the building of atmosphere inside the exhibition room; the U-Thong Sri Dvaravati room. Since the old atmosphere of the room was rather quiet and uninteresting, the researcher created a new atmosphere in connection to the front of zone 1. This zone is the presentation of the stories of Buddhism, using the creation of golden light graphics to make the audiences feel the beauty and the glory. Also featured are the images of Mok flowers falling down slowly. Mok flowers have implications in connection with Thai culture regarding Buddhism, as they stand for purity, liberation from suffering, and Thai people’s beliefs. The Mok flower is also related to the artifacts on display in this room, because all of them, including the Dharmachakras, the Buddha statue in the attitude of giving the first sermon, the Buddha statues on display in the cabinets, and the artifacts which are evidence of various beliefs, are connected with Buddhism. Apart from creating an atmosphere using golden light graphics, the researcher also added the odor of Mok flowers using an odor emitting machine, in order to enhance the liveliness of the atmosphere in the room.

Regarding the presentation techniques in museums, some of them create diorama rooms which look just like real nature. Some places feature the sounds and smells of forests which add liveliness to the exhibition rooms. Some places also adjust the temperature of the atmosphere. See Nikhom Musikakama, The Manual for the Operation of Storekeeper, National Museum, The Fine Arts Department (Bangkok: Amarin Printing and Publishing, 1993), 79.
Figure 72 The digital contents used in Zone 2: The Culture Odor

5.2.2.2 Digital Contents Design

When the audiences enter the room, they will smell the odor of Mok flowers in the front area of the room. Afterwards, the golden light graphics will appear on the wall, and the moving images of Mok flowers will fall down from the upper part of the wall and gradually disappear. The motion graphics will continue to appear in this manner for 2-3 minutes (Figure 72), and then, when there is no movement from the audiences, all the graphics will slowly fade away.

Figure 73 The principle of works and the structure of Zone 2: The Culture Odor
5.2.2.3 Development and Installation

The principle of work in this zone (Figure 73) is the control by a sensor system to capture the audiences’ movements. When the audiences reach a defined spot, the moving graphics will appear on the wall within 3-5 seconds. At the same time, the audiences will smell Mok flowers at the entrance area when they enter the room. The development and installation can be divided into 4 parts, as follow:

a. Regarding the contents, the creation of motion graphics content for the presentation via the projector started from the planning of contents structure, by writing a storyboard with regards to the suitability of the movement positions and the positions of the images that would appear on the actual site. After that, the graphics were designed under the same design theme as that of Zone 1, for the continuation of feelings using design programs like Photoshop and Illustrator, followed by the creation of graphic movements using the ‘Editing program’. Next, a compilation of stories and the rhythms of movements were checked for perfection, in order to be ready to use in the next step, which was the writing of a program to submit the presentation of work.

b. As for the program, it started from the use of a VDO that had been created together with the writing of coding, which was divided into 4 parts according to the projection spots. Afterwards, a control system was built through the Flash program, by writing each action script to display motion graphics when the audiences reached positions which were exposed to the ranges of the sensor system that had been set up.

c. This hardware consisted of 4 projectors, 4 computers and 1 Circuit FK 512 sensor infrared experiment kit.

d. Calculations of the projection ranges in actual areas, which covered all the side walls of the room using 4 projectors in the installation, were necessary. The positions to install the projectors had to be airy enough to prevent overheating which might cause the projectors to shut off by themselves immediately, or cause the projector screens to deteriorate rapidly. Regarding the installation of the sensor in the front area of the room, the most suitable distance for viewing had to be determined. In this step, the researcher chose a circuit kit which detected the audiences’ movements while they walked past.
There was no need to build any system for the installation of the odor-emitting machine, since it was already pre-made. The important thing was to use the fragrance from the Mok flowers diluted with water. Then, after plugging in the machine, it would work automatically. The researcher only had to build a box to cover the machine, to make it blend in with the room atmosphere (Figure 74).
5.2.2.4 The Atmosphere in the Exhibition

As the audiences was to become familiar with the atmosphere in Zone 1, when they reached Zone 2 they would interested and follow the stories in the presentation. Some of them would become more excited in their viewing, due to the change of atmosphere in the whole room and the refreshing smell which reminded them of peace, as if they were entering the land of Buddhism (Figure 75).

5.2.2.5 Suggestions

The experiment needs the same types of projectors that will be used in the real exhibition, in order to determine the right sizes of the files. In this zone, it is necessary to select high-quality projectors which can project the images widely from afar, while the images that appear must be high definition.

Moreover, the positions of the installation must be airy to reduce the projectors' risk of overheating, which may cause them to shut off automatically and cause damage. While the images are projected by these 4 projectors, if any of them shuts off, the projected images will not be harmonious and beautiful. As for the odor, the chosen smell must be appropriate and in accordance with the graphics that have been created. The odor must be wonderful and appropriately clean. Also, the odor-emitting machine must be small enough to be hidden or contained in a box to make it look pleasant.

5.2.3 Zone 3: The Story of U-Thong

5.2.3.1 Design Concept

The Chedi Models no. 2 and no. 13, located in the U-Thong Sri Dvaravati room, have been created to explain the details of the artifacts on display in the room, since some of them were discovered in the surrounding areas of these 2 Chedis. The building of beautiful Chedis which are decorated by stucco sculptures indicates the values of religion, art, culture and craftsmanship in that era. The researcher designed the media of presentation using a hologram technique

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Currently, Chedi no. 2 is located outside the northern moat opposite to the Office of Lands, U-Thong District. As for Chedi no. 13, it is situated outside the moat rampart to the west, approximately 200 meters away from the moat.
which can communicate the contents by narrative voice and 3-dimensional motion graphics, which can be seen on 3 sides of the Chedis. Thus, the audiences will not only be able to listen to the details about the artifacts’ discovery, but they can also feel the glory of the Dvaravati Era through the work that has been designed to shine golden light to illuminate the whole Chedi, which allows the audiences to feel the lively and beautiful atmosphere of glory and faith in Buddhism.

5.2.3.2 Digital Content Design

The pattern of viewing is divided into 2 orders. The first order is when the audiences stand far away from the Chedis. From a distance, they could see the moving image of golden light shining onto the top of the Chedis, which is the motion graphic no. 1 that is displayed all the time (Figure 76). The second order is when the audiences get close to the front of the Chedis. The sensor system will make the motion graphic no. 2 appear instead (Figure 77). This motion graphic no. 2 will present the artifacts’ discovery by showing images of the artifacts floating into the frame, spinning, and then floating away. The movement of the artifacts will be repeated in the same manner, until all of them have been displayed. This motion graphic also features a narrative voice. The artifacts discovered around Chedi no. 2 and Chedi no. 13 are different. The items discovered around Chedi no. 2 include: the stone Dharmachakra, the Buddha image carved from a small piece of stone, a gold ornament (beads), a baked clay sheet with a carved image of Kingnara, a standing Buddha statue, a head of a Buddha statue, a head of a gold Buddha statue and a baked clay sheet with a carved image of the standing Buddha. The items discovered around Chedi no. 13 include: a bronze Chedi’s pinnacle model, 2 standing Buddha statues in the attitude of giving a sermon, a Buddha statue in the attitude of giving a sermon, a head of Bodhisattva Awalokitesuan, a bronze lion statue and a stone Buddha statue.

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8 It is possible to show the graphics on all 4 sides. However, since the Chedis are situated next to the room’s poles, there is no need to show the graphics on that side since they cannot be viewed by the audiences.
5.2.3.3 Development and Installation

a. The contents started from the design of graphics to be presented as moving images, projected from the top onto the holograms. The first step was the writing of a storyboard according to the narrative content, with regards to the suitability of movement positions and image positions. Thus, it was necessary to measure the width and height of the holograms, to determine the sizes of image files and motion graphics. Then, the graphics were designed under the main design theme. The design of motion graphics was divided into 2 shots for 2 orders of viewing. During the development of motion graphics, narrative voice and sound were added to explain the names of the artifacts during their movement. Afterwards, the graphics were rechecked, ready to be used with the program in the next step.

b. The program was the second part of the work, after the making of motion graphics and their codings were complete. This step was similar to the work in Zone 1 and Zone 2, as 2 sets of files (motion graphics No’s 1 & 2) were prepared. Then, the Flash action script was used to write the display commands for
the motion graphics, so when the audiences walked into position they activated the work of the installed sensor.

c. The hardware consisted of: 2 projectors, 1 Circuit FK 512 sensor infrared experiment kit, 2 computers, as well as wooden structures and white cloth used to support the images, acrylic frames to cover the Chedis, and iron structures to hang the projectors and the speakers.

d. For the installation in this zone (Figure 78), there was no concern about the angles or objects which might obstruct the projected images, since projection was from above the ceiling in the near distance. However, a very important part was the installation, which had to begin by experiment in order to find the right positions to build the base structures, which would then attach the projectors to the poles next to the Chedis. In this case, the installation equipment had to be very strong. The installation of projectors on the upper parts of the poles using iron structures had to be firm, strong and unmovable, because moving the projectors up and down affected the graphics projected onto the holograms. In addition, the design of the base structures had to be open to prevent the projectors from overheating.
The next step was the installation of the Hologram (Figure 79), for which the bases had to match the Chedi bases. Also, in the installation of speakers, it was necessary to test the viewing in order to check the possible standing positions, because the audiences’ positions of viewing had to support the perception of sound, since the sound would diffuse towards the audiences but not travel out of the areas and produce disturbances in other zones. In this process, the researcher duplicated the sound system in the hologram. Finally, regarding the installation of the sensor, this part influenced the walking of the audiences. For this reason, the angle of installation had to be exact, and the wiring system from the walls to the inside of the room had to be neatly arranged.

5.2.3.4 The Atmosphere in the Exhibition

In this zone, the audiences could hear the narrative voice which made them feel interested to listen to the stories and see the images of the artifacts, which gradually appeared as 3-dimensional motion graphics. Thus, the audiences paid more attention and spent more time viewing the Chedis (Figure 80).
5.2.3.5 Suggestions

The Holograms which have been created must be light to prevent the Chedis from bearing too much weight, which may cause damage. For the installation of projectors overhead, the base structures for attachment must be strong and stable to prevent movement or breakage. Also, the base structures must be open to reduce the chance of overheating, which may cause the graphics on the Chedis to disappear. The point at which sound is diffused must be designed in a manner that does not affect other zones. Additionally, the work of the sensor system must be checked every time it is activated.

5.2.4 ZONE 4: The Buddha’s Sermon

5.2.4.1 Design Concept

The Buddha statue in the attitude of giving the first sermon, with his right hand lying on top of his left, both placed on the lap, and with the carved image of a crouching deer in the middle part, represents The Buddha’s first sermon in Maruekhatayawan Forest⁹. Therefore, it is possible to enhance the atmosphere and the experience of the audiences by placing a seat for practicing the

Dharma in front of the Buddha statue. The audiences will learn that this mat is for them to sit on their knees, and pay respect to the statue and, by showing their faith, the atmosphere of the forest with tall Bodhi trees will appear on the ceiling. The golden leaves of the Bodhi trees gradually fall down, and the wind and the sound of singing birds allow the audiences to relax, akin to listening to The Buddha’s sermon in Maruekhathaiyawan Forest. Such experience enables the audiences to create perceptions in terms of contents, feeling and imagination, which makes the artifact (the Buddha statue in the attitude of giving the first sermon) become lively and interactively harmonious with the audiences.

Figure 81 The contents in Zone 4: The Buddha’s First Sermon

5.2.4.2 Digital Contents Design

As soon as an audience sits on the seat, the image on the ceiling at an unrisen angle will appear. First, the image will start as a spot of light which gradually grows bigger, as if the light is penetrating through the ceiling. Then, the image of Bodhi trees, with their leaves falling down continuously, will appear for approximately 3 seconds, followed by the sound of birds. The atmosphere makes the audience feel just like sitting and listening to The Buddha’s sermon under the
Bodhi trees for 3-5 minutes. Afterwards, the background of the motion graphics (Figure 81) will turn to become like a wall which gradually closes into a forest atmosphere, until everything becomes black and slowly disappears.

5.2.4.3 Development and Installation

a. The contents started from the graphic design for the presentation of moving images, which would be projected from below towards the ceiling, in the area of the Buddha statue. The process began from the creation of a storyboard according to the contents, with regards to the suitability of movement positions and image positions which had to be within the square frame above. The size of the motion graphics had to fit in the frame on top. Next, the graphics were created under the design theme in accordance with the main concept. The designed graphics were developed into moving images using a motion graphics program. At this stage, the sound effects of the wind, falling leaves and singing birds were added, together with the background music.

b. The program in this part was the second step of the work, and the working process was similar to that of Zones 1, 2 and 3. After the motion graphics were joined with their coding, a Flash action script program was used to write the command to display motion graphics when an audience sat on the mat, which had a switch system installed because sitting activated the computer system.

c. The hardware consisted of 1 projector, 1 computer for projection, 1 Circuit FK 512 sensor infrared experiment kit, a wooden box for projector installation, 1 mat and speakers.

d. The installation of the projection towards the ceiling was quite simple. Nevertheless, the important thing for the installation in this zone was to be careful about any heat, which might cause the projector to overheat when it was hidden below, since the installation could not be completed in an airy space. As for the installation of speakers, it was necessary to check the sitting position of the audience, and it had to be compatible with the direction of sound, since the sound should diffuse towards the audience and not outwards, in order to prevent

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10 The ceiling right above the Buddha statue features a clear square frame, which is the result of the structural design of the room’s ceiling, for improvements such as the electric system upgrade. This structure was designed from the very beginning.
disturbance in other areas. The installation of the projector was made in front of the Buddha statue, and then a box was built to cover it in a way that was suitable for the area; the design was made to be similar to the original exhibition (Figure 82).

Figure 82 The work principles and the structure of Zone 4: Buddha’s First Sermon

Figure 83 The installation in Zone 4: Buddha’s First Sermon
The next step was the installation of the mat, which had to be placed in a suitable position to prevent it from moving or sliding during usage, as it might cause damage to the circuit and wiring system. The researcher had to use glue or other materials to attach the mat to the ground and make it unmovable because, in this zone, the audience had to sit on the mat every time for viewing. Furthermore, the wiring system had to be installed and hidden neatly, since the connections from the wall to the middle of the room was farther than that of other areas (Figure 83).

5.2.4.4 The Atmosphere in the Exhibition

The audiences who liked this zone were mostly elderly people who were interested in viewing the Buddha statue. Most of the aged audiences immediately understood that the mat in front of the Buddha statue was prepared for viewing by sitting on it (Figure 84) and showing the exhibition in Zone 4.¹¹

Figure 84 The atmosphere of Zone 4: Buddha’s First Sermon

¹¹The design work Faithful (The Buddha’s Sermon) in Zone 4 of the exhibition. The 12th Sino-Thai Great Oriental Art Exhibition Dali N Hotel, China, See Atithep Chaetnalao. The 12th Sino-Thai Great Oriental Art (Dali: Dali University, 2013), 47.
5.2.4.5 Suggestions

This zone features a circuit connection which uses a switch on the mat to command the display of motion graphics above. The images will appear when an audience sits on the mat. Therefore, the stability of the switch command system must be checked every time it is activated and inactivated. This is because the system is easily prone to damage from movement of the audience and its weight. Also, the projector is not positioned in an airy space like in other zones, since it must be covered by a box. For this reason, the machine must be rested every 2-3 hours. In addition, the spot that diffuses the sound must be designed in the way that will not disturb other zones.

5.2.5  ZONE 5: Knowing Consciousness

5.2.5.1 Design Concept

The Dharmachakra is considered to be representative of Buddhism. In ancient times, Dharmachakras were usually built outdoors. The encounter of Dharmachakras signified that Buddhism had already reached such areas. In this zone, the audiences will not only find beautiful Dharmachakras, but they will also know about the data, the stories and the meanings which are related to the Dharmachakras from the kiosks in which contents are both in Thai and in English, for audiences to choose from accordingly. The contents comprise information about the Dharmachakras, walking meditation and the sounds of gongs. These three things are all connected with the religion, the teachings and the practice of Dharma. Moreover, in this zone, the audiences will experience walking meditation. During the walk, the audiences will have presence of mind, while they concentrate on breathing in and out.

The researcher designed this zone to make it interesting by adding tactics and hiding the meaning under the footprints. When the audiences stand or step on the footprints, light will appear under the footprints every time, as if it was the light of dharma, followed by the sounds of gongs, as if to announce the goodness of practicing Dharma. Therefore, it could be said that this zone not only builds awareness, but it also gives pleasure and attracts the audiences to practice Dharma, or apply the knowledge that they gain from ‘walking meditation’ in their daily lives.

5.2.5.2 Digital Contents Design

The digital contents used in Zone 5 are different from those of other zones, since there is no use of images or motion graphics. The only things
that are displayed in this zone are light and sound. This zone is divided into 2 parts: the first part is the kiosks, which feature the voice that narrates the history of the Dharmachakras, as well as the practice of Dharma, walking meditation and the meaning of gongs from the Dharmachakras, and the second part is the practice which allows the audiences to participate in perceptions and walking meditation amidst the sounds of gongs. The audiences can choose to listen to either Thai language or English language, and the order of viewing depends upon the viewing behaviors of the audiences. As for the Dharmachakra zone, there will be light and sounds which result from the walking of the audiences each time that they step onto the footprints that have been set up.

![Figure 85 The work principles of Zone 5: Knowing Consciousness](image)

**5.2.5.3 Development and Installation (Figure 85)**

a. The building of contents in this zone did not involve images or motion graphics like in other zones. Instead, the contents were created for the kiosks in 2 positions, on the left and right in front of the Dharmachakras. The
content was divided into 3 main topics, which were: the Dharmachakras, walking meditation and the sounds of gongs. The contents were also separated into 2 sets for 2 kiosks, to be listened to via headphones. Also, the contents about the Dharmachakras were different depending upon the positions of the Dharmachakras (Information concerning the left Dhamachakra and the right Dharmachakra was slightly different).

Next, the contents and details were written as a narrative script, which was recorded both in Thai and English, to be used in the form of audio via a recording program and for presentation by sound from the kiosks. After that, the level of sound was checked and adjusted for smoothness using the Adobe Audition CS6 program. Background sound was also added into the narrative voice as one file, using the Adobe Audition CS6 program and the Logic Pro 9 program. When finished, the file was exported into an Mp3 file to be used in the next step.

b. The program was the second level of work, starting from joining the MP3 file with the coding by preparing all ready-to-use files, and naming them according to their positions of usage. Then, the Flash action script was used to write a command to commence the MP3. The writing of the program in this manner could be applied to both kiosks in front of the left and the right Dharmachakras, since the techniques and the methods of presentation were the same.

c. The hardware consisted of a switch, 1 Circuit FK 405 experiment kit, and 2 computers.

Figure 86 The installation in Zone 5: Knowing Consciousness
d. The installation of Zone 5 shown in Figure 86 was divided into 2 parts, as follow: There was not much concern about the calculation of space for the installation of kiosks. The important thing was to make sure that the height of the kiosks was suitable for every audiences. Also, they had to be installed in areas which allowed easy access to the Dharmachakras and the surrounding artifacts. The kiosks were pre-built from outside and were then installed using 2-sided tape to attach them to the floor for easy demolition.

Next, the installation of the audio control system was completed on top of the kiosks, as the upper part could be opened for the installation of an audio system with headphones. Afterwards, the sound system and the structural design were checked for perfection. The top parts of the kiosks were used for putting on headphones for the audiences to listen to the contents, and the wiring system was therefore placed inside the inner structure of the bases.

As for the installation of walking meditation, most of the circuits, including the light and sound which would occur when the audiences stepped onto the 18 footprints, were systemized and pre-installed on the wooden base outside. Thus, the installation in the actual location could be easily completed, starting from putting all the 18 footprints, which already had their light and switch systems installed, together with the mat. Then, a test was conducted to see if every part worked well, by checking the light and sound which occurred when the footprints were stepped on. If there was any problem, it had to be solved immediately.

![Figure 87 The atmosphere in Zone 5: Knowing Consciousness](image)

For the design of 18 footprints, the researcher analyzed the walking rhythm of many different people to find the right positions and numbers.
Afterwards, the whole mat was installed in the actual area in Zone 5, using 2-sided tape to prevent the footprints and the mat from moving during viewing. As for the lighting system, all the cords had to be gathered together, as there was only 1 channel of wiring for neatness and safety.

5.2.5.4 The Atmosphere in the Exhibition

This zone was popular among larger audiences, because it created the most efficient participation in viewing. However, viewing behaviors were different depending upon the audiences’ ages. Young audiences had fun and were interested in viewing, and they might walk around in bigger groups (Figure 87).

5.2.5.4 Suggestions

The weight from walking and the young audiences in bigger groups could easily damage the circuit system and the functioning of the footprints. Thus, the footprints had to be checked after the system was turned off every day. Also, the headphones had to be cleaned daily.

Figure 88 Sample images of the digital contents used in Zone 6: Remind the Children

5.2.6 ZONE 6: Remind the Children

5.2.6.1 Design Concept

Artifacts are evidence of religion, art, culture, ways of life and history of antecedents, which can all be studied through various artifacts. However, under the original patterns of exhibitions in the room, the complete contents and details of discovery could not be displayed. As a result, important contents and details were put into a manual for viewing instead. Nevertheless, considering the
reading behaviors of Thai people, not many of them will read books for additional information. Therefore, to provide easy, fast and convenient access to information which is suitable for the current Thai way of life, the researcher provided a new medium for the viewing of contents by introducing the scanning of QR Codes in front of the artifact cabinets.

When the audiences want to know the details about any artifact, they can use their smart phones or tablets which are able to scan QR Codes. This scanning process will enable them to access data from a ‘Microsite’ which has been set up to provide information for reading and listening, both in Thai and in English. It can be considered that this method of presentation is harmoniously connected to the new generation’s way of life, in order to learn about history and stories from the past.

5.2.6.2 Digital Contents Design (Figure 88)

The audiences can choose to view the details of any artifact that they are interested in by scanning a ‘QR Code’ in front of the glass cabinet which displays the artifact. Then, the system will link to information concerning the history, discovery and the details of such an artifact. The order of viewing depends upon the audience, who can also choose to view the contents in Thai or in English. In the same way, they can also listen to the narrative voice in both languages:

![Figure 89 The design of a “Microsite” for use in other devices](image-url)
5.2.6.3 Development and Installation

The development and installation in Zone 6 was different from that of other zones because it was not the installation on the actual site. Instead, it was the building of a “Microsite” for the searching of data using the following methods:

a. The content in this zone comprised the contents and data of the images which were used in the work. The researcher took high-resolution photos of the real artifacts from several angles, so that the audiences could clearly see the details. Part 2 was concerned with information additional to the original data inside the cabinets. In this process, the researcher completed research from many sources of data, including the acquisition of information from the museum staff members and storekeepers. Then, the acquired data were designed for presentation using an online medium.

b. As for the program, it began from using the acquired information to write the contents in the form of narration, which was then recorded in Thai and in English. After that, it was used in the form of an audio file via a recording program for listening to using a Microsite. The level of sound was checked and adjusted for smoothness using the Adobe Audition CS6 program. Next, the sound background was merged with the narration voice into one file, using the Adobe Audition CS6 program and the Logic Pro 9 program. When finished, the file was exported into an MP3, ready to be used in the web design of the Microsite.

The design and the addition of contents regarding the principles of design had to be completed regarding each type of potential device (Picture 89). The display of the Microsite, the playback of contents and the fonts, had to be beautiful, convenient for the audiences’ usage, and be able to communicate the contents clearly.

The researcher started the development by writing a Web Program from an HTML Code. The design was created and controlled under the design theme in accordance with the main concept. There was also a command program which allowed the audiences to choose the images, the contents and the sounds, for which loudness could be adjusted. Additionally, viewing could be done both in Thai and in English.
After that, an experiment had to be conducted using the real equipment, in order to examine the stability of usage and to find mistakes or bugs when running the program in 3 systems, which were: Android, OS and Windows, and the researcher had to test many devices, including: smart phones, tablets or other devices. After making sure that the usage and display worked well with all the systems and devices, the first experiment could be applied as a template to be used with the contents of other artifacts, by separating the URLs of each artifact to generate a QR Code and to print for real usage.

c. The hardware consisted of several devices, including: smart phones, tablets and a server for the Microsite hosting.

Figure 90 The work principles of Zone 6: Remind the Children

Figure 91 The working processes of the QR Code, the Microsite and other devices
d. Installation

Regarding the installation in this zone (Figure 90), it could be divided into 2 parts: the QR Code and the Microsite (Figure 91). The QR Code part was the continuation from the generation of a URL Website which contained the separated content of each artifact. The QR Codes were then printed as stickers and placed in position on each cabinet. The position of installation had to allow the audiences to scan the QR Codes easily, and not obstruct viewing. The second part was the Microsite. After adding the data and checking them for accuracy, the information was uploaded onto the hosting site. In doing so, the space on the server had to be rented as an area for online use. Also, an internet network had to be provided in the exhibition room, to support the audiences’ usage (Figure 92).
5.2.6.4 The Atmosphere in the Exhibition

In Zone 6 (Figure 93), the viewing of data through smart phones and tablets, which allowed the audiences to participate in viewing by scanning a QR Code to access in-depth information, in addition to the captions and the manual, was useful for those who would like to obtain more information, both in Thai and English, and which could provide information to foreigners efficiently. It also helped to reduce the problem of not having enough guides to offer explanations and information to every audience at every time. Most of the audiences were able to access such information, especially concerning the contents or the artifacts that they were interested in.

5.2.6.5 Suggestions

The exhibition room should provide devices to audiences who do possess such, so that they can borrow the devices for the scanning of QR Codes at various positions, in order to search for more in-depth information according to their interests. There should also be a manual which provides guidelines for the download of QR Reader programs to assist the audiences’ usage, or there should be staff members who can give advice regarding the use of such devices. Furthermore, a high-speed internet must be provided for fast downloads and prompt displays for the many audiences who access the internet at the same time.
5.2.7 Summary

In order to use modern technologies mixed with original methods of presentation in the same area of an exhibition, the researcher needed to apply a wide range of knowledge in various aspects, including: the design of interactive media, space design, contents design, narrative contents analysis, program writing, graphics design, motion graphic creations, sound design and editing, structural design, and a great variety of techniques applicable to the media.

During the design process, the researcher’s main concept was to communicate by adding liveliness to the artifacts and create new experiences when viewing the museum, with the help of interactive media technologies and with regards to: the artifacts or art objects, their contents, the space or the installation in the original space, the methods of presentation, the groups of audiences, the viewing behaviors, the atmosphere of the room, the structures of equipment and techniques and technologies.

These things not only created interest, but the important thing was that they created learning, perceptions and emotions. The researcher’s work also required highly precautious analysis of media design for the exhibition, from the installation to the period of exhibition, because the technical design involved the connection of circuits, the cooling of electronic gadgets, and the demolition - which might cause damage to the original space.

Most importantly, the artifacts in the exhibition room were of extremely high value, and thus could not be fixed or reconstructed. Hence, the steps of work from the planning of the design concept to the installation, and the demolition, all required excellent management and maintenance.

5.3 Exhibition Management and Maintenance

5.3.1 Exhibition Management

This exhibition was not only open to tourists or people who were interested in viewing, but it was also for the data collection from associated audiences. Therefore, the management was divided into 3 parts:

5.3.1.1 The maintenance of the installation system: Throughout the period of the exhibition, it was necessary to have people who were specialized in technical work to be responsible for turning the equipment on and off, as well as
checking each zone to make sure that all systems worked well. Therefore, the researcher’s team established a group of specialists who had to check the systems in every zones on a daily basis, as well as solve on-the-spot technical issues.

5.3.1.2 Care and advice for the audiences: A manual for viewing alone might not be enough, as some audiences would like to have someone to guide them and provide them with detailed information during the viewing of contents in each zone. Since “The Replay” exhibition used interactive media in the exhibition, some people might be curious or become especially interested.

5.3.1.3 Data collection from the audiences: The researcher established a team to collect data from the audiences, by giving out questionnaires and conducting interviews. The questionnaires were given to people in general who willingly agreed to provide such information. However, as for the interviews, the researcher selected the interviewees from audiences who had knowledge about museums, education and perceptions, since the questions in the interviews explored the interviewees’ personal analytical principles. Therefore, those who provided information during the interviews needed to be equipped with the knowledge that the researcher thought would allow them to provide information about the topics that the researcher was studying.

5.3.2 Exhibition Maintenance

Maintenance was considered a major part of the exhibition, especially when interactive media technologies were used in the display. The maintenance could be divided into 2 parts, as follow:

5.3.2.1 The equipment: It was necessary to examine any damages which might happen in terms of durability, especially wooden or iron equipment which were used for the construction of bases or brackets. These tools needed to have their stability checked constantly before use. Examples include: the base for walking meditation in Zone 5, and the bases or the holders of projectors, as well as the equipment which was used for technical work, such as: projectors, computers, the odor-emitting machine, speakers, headphones, and the mat in Zone 4, etc. This equipment needed to have its conditions checked before usage. The important tools that needed special care were the projectors, which had to be turned off every 2 hours to maintain their condition and prevent damages.

5.3.2.2 Control systems: The control systems needed to be checked as to whether or not their functioning was normal by people who installed the
techniques during the installation period, or people who had appropriate knowledge about techniques and programs. These people knew the methods of examination in each part, and were able to fix the damages of certain parts when problems had been identified. The control systems involved the functioning of control programs in each zone, such as Sensors, Holograms and QR Codes.

Figure 94 The atmosphere during demolition/uninstallation of the exhibition

5.3.3 Uninstallation/ Demolition (Figure 94)

a. The demolition of all the equipment had to be done in part via the circuit systems, since they were connected to many parts in each zone. Therefore, demolition had to start from the uninstallation of circuit systems and the separation of cords and wires first.

b. The equipment had to be separated according to category, since most were made by mutual application. Therefore, they could also be developed for future use.

c. The uninstallation had to be done in an equally careful manner as per installation, i.e., safety had to be at its highest level, in order not to affect the artifacts and the physical environment of the exhibition room.

d. The demolition of brackets on the walls also had to be done carefully, to minimize any traces or not to cause any at all.

e. After the demolition, any damage, such as the traces of brackets on the walls or the stains from 2-sided tape, all had to be fixed. It might be necessary to repaint the walls or change the tiles.
5.3.4 Summary

Under the management and the maintenance of the exhibition inside the room during the exhibition, the researcher had to determine a management plan to cover everything, and to set up teams to take care of each aspect. Throughout the period of the exhibition, the researcher set up a technical team to deal with problems in terms of equipment and operational systems of the programs. The researcher had to check the functioning of every zone daily, after the tools were switched on and off. Another important thing was that data collection was crucial to this research, since the audiences’ opinions were indicators of the success of the concept of study that the researcher had determined in the early stages. The researcher needed to collect data by the use of interviews, questionnaires and by observation. Since the exhibition lasted only 3 weeks, the data from audiences had to be compiled as much and as quickly as possible, from the first day to the last day of the exhibition, in order to utilize those opinions for the conclusion of the study, and for the provision of suggestions for the development of the researcher’s future work.

The last step was the demolition, which was affected by the installation. If the structure of the installation was planned properly, the demolition would be easy. All in all, the management and the maintenance of the exhibition was considered very important to the research, as they continually affected one another, and were directly connected to one another. For instance, good installation allowed easy demolition and easy maintenance. Also, the amendment or the maintenance of systems throughout the exhibition period, together with the guiding team who gave advice during the viewing, would enable the audiences to view the exhibition without any problems, resulting in a much easier and more convenient compilation of data and opinions from viewing.

5.4 Chapter Summary

For the development of the prototype exhibition at U-Thong National Museum, the researcher had to set up the scheme as a sequence of including: the planning of the exhibition concept, the design of moods and tones, the graphic works, the exhibition patterns, and the participation as a guideline for the design of each zone. Thus, the researcher would start the design and the installation in each
zone, which required knowledge and proficiency in various aspects. The desired outcome was that the audiences who came to view the exhibition had to learn, perceive, feel and memorize. Such an outcome would be analyzed from the collection of data from the audiences, via the methods of interviews, questionnaires and observation. To achieve all of this, the researcher had to control the management and the maintenance of the exhibition, in order to make sure they followed the plan.

Throughout the working period, the installation step was prone to problems. Therefore, the researcher could draw a conclusion to provide suggestions and to allow designers to get ready to handle problems which might happen during the extension of work, or the development of work to be applied in other locations, as follows:

a. Some problems may occur during the installation, such as issues with the light system, the equipment and the sizes of wooden boxes. The solving of such problems would be pressured by the time constraints available during official working hours. Thus, the solution must be most rapid and accurate. Therefore, the solving of problems at this point will need teams of technicians who are specialized in different techniques, and can handle any problems during installation.

b. The timing for installation must spare some time for the solving of on-the-spot problems as much as possible, and it must be managed and controlled as planned.

c. Regarding the techniques which require projections, the same projectors which will be used in the real installation at certain positions must also be used in experiments, in order to minimize any mistakes concerning image sizes, and to save time in the installation and for reducing the editing of digital files.

d. During the installation in an exhibition room which already displays artifacts, it is extremely necessary to be extra cautious, since every artifact is so valuable that its cost of damage cannot be estimated.

e. The technical maintenance system must set up the time for the turning on and off of the equipment during the day, because the projectors which are used in some zones must be turned off every 4 hours. Therefore, to reduce the damages in this part, any viewing should be done in rounds, or at least the systems in every
zone must be shut down at noon for one hour, and then the viewing can resume after 13.00 onwards.

f. The budget and the technical team for maintenance must be prepared to adjust the exhibition room back to normal after the exhibition is over. For example, the stains from sticky tape or any traces of wall penetration must be fixed and repainted, or damaged tiles must be replaced. Thus, if there is a plan to utilize this model in any museum’s work, then there must be preparation in terms of budgets for this step as well.
6.1 The Replay: U-Thong Sri Dvaravati Exhibition Analysis

Regarding the analysis of the results from the questionnaires, the interviews and the observations of the audiences’ behaviors during “The Replay: U-Thong Sri Dvaravati” exhibition in U-thong National Museum, overall, the audiences consisted of various groups of people of different ages. Most of them spent 30 minutes viewing. There were 2 ways to view the exhibition. The first way was viewing guided by a staff member, who gave advice with regards how to view the exhibition, and in this case, the audiences would view the exhibition zone by zone, from Zone 1 to Zone 6 as suggested.

The second way allowed the audiences to view the exhibition on their own, permitting the observation of viewing behaviors. In this case, the staff members would hand out a manual on how to view the exhibition to the audiences, when they entered the room. According to observations, some audiences focused on the viewing of artifacts, some paid attention to the additional media, and some consulted the staff members when they had a doubt at certain issues. The analysis of the questionnaires and the interviews of the audiences are concluded in the topics that follow.

6.1.1 Perceptions of Audiences

The content in each zone provided quite a lot of details and knowledge for the audiences compared to the U-Thong ancestor room in the original exhibition room, on opposite sides of the U-Thong Sri Dvaravati room. Also, “The Replay: U-Thong Sri Dvaravati” exhibition was able to create knowledge and understanding within an interesting atmosphere and make the audiences spend more time viewing of artifacts. Therefore, they had more time to contemplate and

1Conclusion of results from interviews and surveys, with the participants as audiences of the exhibition “The Reply: U-Thong Sri Dvaravati”, with the survey duration being from the first day to the last day of the exhibition.
perceive the contents and from Figure 95 shown that after the exhibition, most people recognize the good and very good.

![Figure 95 The analysis of perceptions of audiences on the Replay: U-Thong Sri Dvaravati exhibition](image)

According to the interview with Mr. Pongphan Surawatcharoen, the manager of Sharp, he thought that if he viewed the U-Thong ancestor room, he might take less than 10 minutes, due to his uninterested feeling. According to the interview with Mr. Verasak Vichitsangsri, Deputy Governor of Suphanburi Province, the problem of viewing museums in general was the limitation of staff members to guide the viewing and provide information. The use of technologies to assist the presentation of contents not only allowed the audiences to receive more data and knowledge, but it also solved the problem of the lack of staff members to guide such viewing.

In addition, from the viewpoint of the archaeologist Mr. Baworawet Roongroojee, an inspector from the Ministry of Culture, he gave an interesting idea, in that; “Personally, since I am an archaeologist, I have already learned such knowledge. However, for people in general, the technologies will be able to make the artefacts more interesting. However, in terms of additional knowledge, this depends upon their existing knowledge and also their personal interests. Still, the creation of participation using technologies as a media can help to create interest,
and make the audiences concentrate more upon viewing the artifacts and finally gain knowledge automatically.”

Apart from knowledge, the audiences also perceived feelings as if they had actually entered the places in the exhibition’s contents, which allowed them to relate to their experiences and thus perceive very well, which turned into good memories. For instance, some audiences really liked Zone 4, because it made them feel peaceful, as if they were in the real event. Therefore, it could efficiently attract their interest and create their concentration in viewing. Nevertheless, the use of interactive media technologies among Thai people needed time to develop familiarity and create perceptions of different environments between town societies and rural societies. In addition, some audiences thought that the use of sound in the presentation contributed to easier communication. Thus, the audiences could comprehend the contents and gain knowledge more easily and clearly.

Figure 96 The analysis of suitability of the atmosphere on the Replay: U-Thong Sri Dvaravati exhibition

6.1.2 Suitability of the Atmosphere

The atmosphere which was created by light, colors, sounds and the smell of Mok flowers, and motion graphics changed the dim atmosphere of the original exhibition room. Figure 96 shows clearly that most audiences agreed that this

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Very Good
Good
Fair
Less
Least
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method of exhibition that can create a better atmosphere in the room was the most selected answer was good and very good, and did not reduce value of the artifacts.

Mr. Verasak Vichitsangsri, Deputy Governor of Suphanburi Province, said that; “The atmosphere which has been built in this exhibition can turn the artifacts into valuable, vivacious and exciting living objects. As a result, the museum can offer new access to the newer generations more, and it will not be viewed as old-fashioned.” Moreover, the odor of Mok flowers allowed the audiences to relax. Most audiences felt that this exhibition emphasized more the enhancement of atmosphere rather than the giving of information. However, the atmosphere was able to attract the audiences’ attention, and thus make them spend more time viewing. Also, some audiences suggested that the Thai atmosphere should be added to impress foreigners.

Diagram 24: The analysis of suitable for display using interactive media with artifacts and the most interesting points of Replay: U-Thong Sri Dvaravati exhibition

6.1.3 Concept Model and Suitability

From the both graph (Diagram 24) it can be concluded that regarding the suitability of the exhibition’s concept model, which applied interactive media technologies to assist in the display of artifacts, art objects and historical contents;
most audiences agreed that it was quite appropriate to make the atmosphere in the room more interesting. The researcher’s presentation approach and the objectives of the exhibition still aimed to make the artifacts the most interesting things, by improving the methods of presentation. The result was as expected. According to the survey, it was discovered that most audiences still paid attention to and were interested in the artifacts the most. The next things that caught their attention after the artifacts were the methods of presentation and the contents of the exhibition. Before organizing this exhibition, the researcher found out from a survey that the methods of presentation and the contents of an exhibition were the least interesting things in the original exhibition room.

Mr. Pongphan Surawatcharoen commented that: “These days, we cannot deny technologies as we can see sermons on TV, the Internet and online media. The Replay: U-Thong Sri Dvaravati Exhibition is another step forward for exhibitions which merge technologies with artifacts in a Thai museum.” Mr. Pongphan Surawatcharoen (Figure 97) had been involved in the technology industry. Therefore, he could see the development of industries which applied more technological media in several contexts.

Figure 97 Interview with Mr. Pongphan Surawatcharoen

Phra Ajahn Mana Wiriyathammo talked about the concept of an exhibition which used interactive media technologies to assist the display of artifacts

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2 Interview with Mr. Pongphan Surawatcharoen, Marketing Manager, DS Marketing Department, Document Systems Division, SHARP THAI CO., LTD, November 9, 2012.

3 Interview with Phra Ajahn Mana Wiriyathammo, The abbot of Wat Pa Soonyataram, Australia, November 9, 2012.
that; “This type of presentation is creative, because it can make the audiences understand the core meanings of the artifacts and the art objects.” According to the opinion of the venerable person mentioned above, even though this concept might be suitable and was able to make the presentation interesting, the important thing for the presentation was to be careful not to obstruct the artifacts, which may cause the audiences to become less interested in them.

Additionally, caution had to be paid to the light, which might generate heat and affect safety and damage of artifacts. Nevertheless, some zones of “The Replay: U-Thong Sri Dvaravati Exhibition” might be suitable for special or temporary displays to create newness and make the exhibition room more interesting, since young audiences might feel excited during the viewing and easily cause damage to the equipment used for presentation or even the real artifacts themselves. For example, the walking meditation in Zone 5 is a zone which will need special precautions, in case it should turn into a permanent exhibition. In that case, there must be an appropriately developed structural design and system, to prevent damage which can be caused by some groups of audience.

**Figure 98** The analysis of choosing the right techniques on the Replay: U-Thong Sri Dvaravati exhibition

6.1.4 Choosing the Right Techniques

According to the survey from all audiences (Figure 98), the technique selection in each zone was quite suitable for the contents and the artifacts, according to the survey of details in each zone, it was found that the audiences’
opinions were still contradictory. For instance, most audiences were fond of and impressed by the “walking meditation” in Zone 5, since it could give them peace of mind, while other audiences thought that walking meditation focused more on the activity rather than the viewing of artifacts, and that more academic information had to be added.

All the techniques that were selected for the whole exhibition contributed to a good presentation which attracted the audiences’ attention. Even though the audiences’ study of content largely depended upon the individuals’ basic knowledge and experience, it could be concluded that the presentation techniques were able to create greater interest, as the audience spent more time in the viewing of each zone. Also, for those who were interested in the data and would like to study more, they were able to get easy and fast access to details, which was suitable to the daily life of the newer generations, including students and people in general. One example was the exhibition in Zone 6, which applied current technologies appropriately and creatively.

Figure 99 The analysis of development of concepts on the Replay: U-Thong Sri Dvaravati exhibition
6.1.5 Development of Concepts

From a survey of the audience after viewing in the Figure 99 in the Interests, Knowledge Level, Museum Admission and Further Extension Concept can conclude that, most audiences noted that the approach or the concept of “The Replay: U-Thong Sri Dvaravati Exhibition” could be further developed and applied to other museums, in order to allow audiences to participate in the viewing of artifacts and art objects. They also thought that if this type of museum turned to using interactive media in an exhibition appropriately, it would be able to make Thai people visit museums more. This was because this model of exhibition created emotion and understanding, so that the audiences could feel the atmosphere of beauty and value, which resulted in the audiences’ love and desire to preserve the artifacts. Even if the students came to visit the museum because they had to study the content to prepare reports in their classrooms, if they had a chance to view the museum in an exciting and interesting way, they would be fond of and impressed by it. As a result, the words of recommendation would spread from one person to another or through online communication, which is considered a good sign which can help Thai people to become more interested in following the work of Thai museums more. Nevertheless, local museums have to realize how much this type of presentation is suitable for the perceptions of their audiences, because local audiences are different from urban ones in terms of familiarity with technologies. The attitudes, viewpoints and preferences of museum owners are different as well. However, when comparing Thai museums to foreign museums, foreign museums are able to design exhibitions in a way that makes them as interesting as travel destinations. A good example is Singapore. Although Singapore’s history can only be dated back 40 or 50 years; museums in this country design their contents and forms of exhibition so well that the museums become tourist attractions.

Figure 100 Interview with Mr. Baworawet Rungrujee
Mr. Baworawet Roongroojee (Figure 100) expressed his opinions while viewing the exhibition, in that; “This type of exhibition can be promoted as a museum which is alive, unlike in the past, and it will help to develop the role of museums to the next level. As a result, Thai people will become more interested, and the contents will be more interesting. Nevertheless, the contents must be real and correct.” It could be analyzed from his saying that this concept can help to develop the role of museums and solve the problems of museums, which have been ignored by Thai people for a long time.

In addition, Phra Ajahn Mana Wiriyathammo (Figure 101) came to view the exhibition and really liked it. He suggested that; “The more Australia stresses the importance of modern technologies and uses them, the clearer the images are. It also helps to increase the value of artifacts which reflect upon consciousness, ideas and the abilities of people from the past. Technologies have both advantages and disadvantages, and they must be applied in a useful manner. As for the application of this concept, it is beneficial because it can help to create better understanding of the contents.

This concept should be practiced more throughout the country. According to the suggestions by Phra Ajahn Mana Wiriyathammo, Mr. Baworawet Rungrujee and most of the audiences, they agreed with the further development of

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4 Interview with Baworawet Rungrujee, Inspector General of the Ministry of Culture & now is Director of Department of Fine Arts, Ministry of Culture, November 9, 2012.

5 Interview with Phra Ajahn Mana Wiriyathammo, The abbot of Wat Pa Soonyataram, Australia, November 9, 2012.
this concept to be used in other places or museums. Still, the researcher had to consider the contents of such places. Furthermore, in the future, if this concept can become a role model for other museums, the maintenance and the use by staff members and the team to maintain such systems should be considered as well.

6.1.6 Summary

Apart from the analysis of the 5 issues mentioned above, the results of the survey of audiences revealed that most were female. Their average age was between 30 and 39 years old, and 12-25 years old. Most of them were teachers, as well as undergraduates and graduate students. Their reason for viewing was to gain more knowledge and to gain inspiration for their work. Most audiences were local people⁶, since most people who were invited by the National Museum on the exhibition’s opening date were teachers from Suphanburi Province. According to the survey, most audiences visited U-Thong National Museum for the first time, and used to visit other national museums only 1 or 2 times a year, or never. The researcher could analyze that Thai people hardly visited museums because even local people with good educational background and good careers still ignored or did not see the importance of visiting museums.

Most audiences liked and appreciated this exhibition. Some of them accepted that they were surprised to see such a presentation in a museum which displayed these artifacts. However, the audiences provided suggestions during their viewing, as follow:

6.1.6.1 In terms of installation, if the work is further developed in the future, the equipment which generates the work, like projectors and computers, should be concealed for a better impression of the images that appear.

6.1.6.2 The light and motion graphics in some spots should be clearer.

6.1.6.3 The sound in Zone 3 should be clearer, or the loudness should be adjustable by the audience.

⁶The groups of people in that local area are those who live in Suphanburi Province and nearby provinces.
6.1.6.4 The selection of techniques or technologies for presentation should also consider the case of having many audiences coming to view the exhibition simultaneously.

6.1.6.5 In the application of technologies, there may be system errors during usage. Thus, the program stability must be closely controlled by technical experts.

6.1.6.6 There should be staff members who lead the audiences during their viewing, or have very clear advice about how to view the exhibition, because some audiences may not be familiar with this pattern of viewing.

6.2 Conclusion Experimental Prototype Model

6.2.1 Conclusions of Using a Prototype Model

The experiment was completed according to The conceptual model using interactive media technologies in museum artifact collections, wherein the researcher used interactive technology at an exhibition in a national museum, in order to create Perception through participatory observation. The experiment trial was completed through “The Replay: U-Thong Sri Dvaravati”, and the results displayed that concepts of construction in each step were relevant to inter-disciplinarian knowledge, with influence upon the exhibition arrangement; be that in terms of: history, content design, media interaction, digital media and various craftsmanship, as well as the design and management of the exhibition.

Thus, every single step is very important, and needs to employ experts for this particular conceptual model’s development. In each step, there must be adequate management and administration, as well as data collection for evaluation and forming a conclusion. The importance of idea development of participatory awareness construction in a museum, along with interactive technology in conjunction with an exhibition in a national museum, could be divided into main points worth emphasizing, as follow:

6.2.1.1 To create interactive and easily understood media that interests audiences, so that they may obtain knowledge and become aware of the exhibited content.

6.2.1.2 Design development in the process of exhibition format analysis in each particular step. There must be homogeneity in the exhibition
techniques, content and the original space. This particular design was crucial for the overall picture of the exhibition pertaining to appropriateness of the concept.

6.2.1.3 Audience behavior and awareness; this could be studied using the museum’s audience, in order to analyze them in terms of behavior and awareness, whereby this could be linked to the design.

To conclude the results from the experiment concept, utilizing the exhibition model, this concept could create awareness for the audience. They became more aware and felt more, compared to the past. It created an atmosphere that let the audience to enjoy the exhibited content and enhance their feelings as an audience. By using a number of techniques for the exhibition, the audience spent more time in each exhibition zone. However, how aware they became concerning the content may depend upon individuals. Most audiences believed that this concept was appropriate, and could be used to enhance other museums exhibiting ancient artifacts and art pieces. Notably, caution must be applied to this concept, especially in a presentation that may obstruct the view of an artifact. This might result in decreased interest of the audience in the artifact itself. There must also be caution concerning about lighting and a change of temperature in rooms, because the surrounding environment can impact upon surface materials and conditions of ancient artifacts themselves.

Therefore, this concept should be considered to create incentives that draw more audiences into the museum, by creating impressions and new experiences for such. However, this concept must be aware of the aims of the museum construction in the first place, or of conservative individuals whose sole interests concern only the artifacts. Hence, this particular concept could not be used in all museums, because there would obviously be other external factors that must be thoroughly studied beforehand. This has to be completed so that there would be no faults or undesirable impacts upon the audience, and under an affordable budget.

6.2.2 Summary of Hypothesis

From using the participatory awareness construction model in a historical and archeological museum, with an emphasis placed upon the interactive

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7 Prior to the experiment, the researcher set up 3 hypotheses from chapter 3, as mentioned.
technology applied to the exhibition, the researchers came up with 3 hypotheses. After the experiment of the conceptual model from the exhibition; “The Replay: U-Thong Sri Dvaravati” hypotheses could be concluded as follow:

6.2.2.1 To bring interactive media into the content presentation in an historical and archeological museum can stimulate and create interesting phenomenon for the audience.

As a result, the communication of content using interactive media between content, artifacts and the audience helps the audience understand meanings more easily and clearly, in a more realistic atmosphere. The audience will have the easiest and clearest form of presentation through audio and visual aids. This would also be uncomplicated. Furthermore, the majority of audiences also suggest that using interactive media in an exhibition can create a niche market through technique usage or novel media, and it may draw audience interests and increase their observation times.

6.2.2.2 Interactive media permits audiences to participate more in a museum observation. They can also encounter new experiences in terms of awareness, emotions and memorability.

The result of this would be that the majority of audiences acknowledge feelings and liveliness from the atmosphere created by the researchers. The audience came to understand the concept of “Golden light glistening, U-Thong Civilization”. For the exhibition, when the audience did have interests in the presentation and the atmosphere, the artifact values would be enhanced. More people would also be interested in them. The audience would be able to learn the meanings and values of ancient artifacts as a result. The processes of learning and becoming aware depends upon a number of components and factors, such as the

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8 Results from the survey of “The Replay: U-Thong Sri Dvaravati” - Exhibition at Zone 4: Faith. Apart from the content, this demonstrated to the audience the expression of ‘Dhamma’, by Buddha, in Isippatana Maruekhathaiyawan Forest, that they could be in a more realistic surrounding. Thus, the majority of the audience liked this zone.

9 From the survey of “The Replay: U-Thong Sri Dvaravati” - Exhibition at Zone 3: Story Telling - this zone allowed the audience the clearest and easiest to understand awareness, because the presentations through visual and audio aids were clear.
original knowledge and experience of audience, their specific interests and attitudes, their society, their livelihood, as well as their physical and mental condition.\footnote{Atithep Chaetnalao, “Museum Interactive Perception: Design Study of The Replay: U-Thong Sri Dvaravati” (Oral Presentation and Proceeding Published: AFAS 2013, ASEAN Fine Arts Symposium, Amari Atrium-Bangkok, Bangkok, Thailand, April 27, 2013), 76-81.}

6.2.2.3 This particular concept on model could help Thai museums in its development and improvement according to the Thais’ awareness, in terms of museum visits nowadays. It could create a positive attitude towards Thai museum, as well as gradually changing the presentation format of the museum towards a participatory format.

As a result, this particular model was designed to be appropriate for Thais’ sense of awareness. This is because the majority of the audience understands the communicated content, and acknowledges its meaning\footnote{Results from a survey of “The Replay: U-Thong Sri Dvaravati”. The content communication and awareness of meaning in each zone of the exhibition was rated “very clear”. All 6 zones.}. The audience appeared to prefer this concept, and stated that it was appropriate for the exhibition\footnote{81% of viewers thought the format or exhibition’s concept using interactive media (modern technology) is a suitable collaboration with exhibitions of ancient artifacts, art pieces and history.}. Most of the audience\footnote{87% of the audience gave opinions that the format of the concept of the exhibition could be furthered in other museums also holding exhibitions of ancient artifacts.} stated that this format or concept could be used in other museums\footnote{84% of the audience stated that if the museum exhibited ancient artifacts, art pieces and history using interactive media at a suitable proportion like this, it may draw more Thais to make a museum visit.} holding exhibitions of ancient artifacts, as well. They commented further, that if museums holding exhibitions on art pieces, ancient artifacts and history started adopting interactive media in appropriate proportions, then more Thais would be interested in a museum visit. As such, this particular model or concept was likely to help Thai museums develop and improve according
to the Thais’ sense of awareness during a museum visit in the future. It could also create a positive attitude towards Thai museums, as well as lead to a gradual change in Thai museum presentations pertaining to a participatory format. Additionally, some audiences\textsuperscript{15} hoped for this model to be used in the development of other museums. They also wanted relevant officials of Thai museums to realize the potential and consider it for future applications.

6.2.3 Finding of the Experimental Model

From the steps of studying, designing and product development, up until the exhibition arrangement, including data collection, the researchers could conclude the main points of knowledge as follows:

a. If one brought in previous experience of traditions, beliefs and cultures to be a connecting part between the audience and ancient artifacts, then it would create deeper feelings and more attachment to the artifacts. At the same time, the audience would receive more emphasis on beliefs, and gain greater memory and experiences that could be collaborative with the audience’s livelihood. Thus, these points were more important than simply using interactive media technology. This was because media was the only tool used for communication between the audience and the ancient artifacts. Interactive media technology could change quickly throughout time, but what permanently remains is the crux of the content and information of the ancient artifacts and art pieces themselves. Therefore, the presentation must look for the crux of the content and ancient artifacts. One must see what it truly was about, and which messages were to be communicated. Afterwards, one could search for a method to place importance and shared experiences. It could be concluded that the presentation or the exhibition must start from the crux of the artifact itself, to see how well it could present itself. Then there would be a construction of shared experiences concerning ancient artifacts, from the very proposal of techniques and content-enhancing technology. If any artifacts were able to present themselves well, then participatory media might not always be necessary. It should not be forgotten that for any exhibition within a museum exhibiting ancient artifacts, the crucial point is the artifacts. Technology is

\textsuperscript{15} Such as, Phra Arjan Mana Wiriyathammo, The abbot of Wat Pa Soonyataram, Australia, and Mr. Verasak Vichitsangsri, Deputy Governor of Suphanburi Province.
merely an enhancer to make the artifacts more interesting and livelier; it should be used only according to what is appropriate and necessary.

b. For an exhibition within the museum, whether the exhibition is utilizing techniques or modern technology, communication and tools for observations should use equipment an audience is familiar with, and that they use in their daily lives. They should be used to connect to the audience and give them a sense of familiarity and participation.

Thus, they may have fun and understand the contents more easily, and conveniently, because if the communication is designed in an exceedingly modern way, then the museum audience’s group of adults, whose main purpose is to see artifacts, may create backlashes. This could happen because the communication methods are too modern, resulting in audiences being unfamiliar with such, thus becoming afraid to use or try it, due to a fear of making mistakes or being looked down upon by others as being old-fashioned. Therefore, one must be cautious about adopting technology which is too modern or too odd, as it might be unsuitable for the audience’s lifestyle.

6.2.4 Discussion

a. From the processes of a content experiment and technique in the actual space, and to create perfection or audience satisfaction in participating with ancient artifacts or art pieces, the best method was to have a trial in the actual space. From the trial in the actual space within “U-Thong Sri Dvaravati”, it was revealed that the researcher decided not to adopt the concept of “mapping”. This was a motion graphic picture screening aimed at the Buddhist statues\(^\text{16}\).

The reason for this was that the researcher had observed some audiences expressing faith and respect towards the Buddhist statues. Some did pay respect by “Wai-ing” and touching the Buddha statue (Figure 102). This meant that using the particular media would not be suitable for the observation behaviors. The audience’s previous experiences, as well as their traditions and livelihoods, could all affect their cultures, beliefs and religions. This incident caused the researcher to place importance upon the history of Buddhist statues, cultures, the beliefs and the religions of audiences. This had to be studied from a historical and archeological point of view, and then used to develop designs suitable for the audience.

b. From interviews, observations and conclusions of surveys, one could differentiate a group of individuals who preferred old norms to be those works related to museums. They would be protective of history and the original formats of presentation. This particular group could be a group of adults or workers in the archeological field. It came to attention that this particular concept must not have too many impacts upon this group. To be presented in an uncompromising way, one must avoid creating negative impacts or conflicts. However, if individuals whose work related to museums still continued to believe in and prefer conservative values, then museum work would remain problematic. In the end, it would continue to draw attention only from a specific group of individuals, similar to things as they are in today’s climate.

Truthfully, museums could create more learning opportunities than currently exist. This could create more values for artifacts and museums, for which
society considers their values to be high, yet irrelevant and not inclusive; resulting in
them failing to create attachments or appreciation of values. These could become
an assignment for agencies and individuals working in the field of museums.

There must be gradual thought adjustment, by slowly integrating
technology, in order to help create participation and strong connections between the
audience and ancient artifacts. This could be in terms of history, national values,
etc.\textsuperscript{17}, and such would give the current generation of Thais access to the nation’s
identity and their own individuality.

The design project made by the researcher is aimed at trying to
depict the events of the “U-Thong Sri Dvaravati” art cultures and lives, while modern
technology is applied to make a clearer story concerning each piece of artifact
exhibited. It will serve as a tool to close the gap between past and present, communicate the meaning and encourage learning, and help in accepting the values
of artifacts. This practice is necessary, because in present Thai society, amongst the
new generations of Thais, history is beginning to fade. Thus, history should not be
something like an old record or story of unrelated pasts, but something that the
present generations need to learn more about. According to Lisa Graham stated that
knowing more about the cultural backgrounds of your audience will help you figure
out how to communicate your message more effectively to them.\textsuperscript{18} They should
pay more attention to understanding and reaching the true values of people,
deserving of having a strong national identity as a smart Thai in the ever changing
world.

c. When the researcher conducted interviews, the main issues of
interest concerning the exhibits were the means of interaction with such exhibits,
artifacts and processes or workflows. Thus, the possibilities for the application of new
digital techniques, applied to historic sites or museum exhibitions, can be made in
two ways: First, the exhibition is proposed to model exhibits and artifacts using
interactive media from the very beginning. Modifications are required, which may

\textsuperscript{17} Cheevit-Maisinvang: “The Replay: U-Thong Sri Dvaravati episode 1, 2,” Broadcast

\textsuperscript{18} Lisa Graham, The Principles of Interactive Design, (New York: Delmar Publishers,
1999), 23.
include designs for new exhibits within the museum. Second, interactive media with a proper combination of media and artifacts permits both of them to be developed together. Adjustments can be made in the case that where an exhibition is moved from one site to another, and where modifications are required. The practice of mobilizing an exhibition from one place to another is a good exercise for a museum exhibition designer, and the rest of the staff members. They can learn about necessary modifications to exhibition details which have been gained from their professional experience, thus completing a type of learning exercise pertaining to practical exhibition problems in detail.

6.3 The Further Integration of Interactive Media and Museums in Thailand

6.3.1 Factors Affecting the Development of Exhibits in a Museum

The development of Thai museums has taken places for many decades; the researcher found that in the 21st century, interactive media and a visitor oriented mode of presentation became the key variants (factors) initiating changes. Three factors are to be taken in consideration: 1) Thai attitudes and habits, 2) cultural beliefs, faith and values, and 3) perceptions, acceptations and regional experiences. The results were predictable, and are summarized as follows:

6.3.1.1 Thai attitudes and habits affect the future of media usage. Thai people are consumers with attitudes and habits, which will make it more likely that the future will bring new technologies and that they will also be using media and technologies more and more. For instance, using mobile phones to access the Internet is considered necessary to sustain life. Thus, if a museum can reach these people then that will have a good effect upon such media, communications, and awareness as well. Furthermore, as new inventions concerning media continually meet the needs and demands of consumers in all circles (and museums as well), forcing the habits of people who are easily tired, Thailand will thus result in a variety of medias that can be used to communicate and develop dynamically.

6.3.1.2 Cultural beliefs, faith and values in Thailand have a long history; that has been the implantation of cultural beliefs and values, some of which have been passed from generation to generation. Although the stories to hear are stories from the past, nowadays people cannot find or experience such directly, and some of the stories told are semi-articulated. Thais are people who are committed
to holding onto nationalism, probably because of historical Thailand, which was never colonized by any country. To inculcate cultural beliefs and values, the some still need to remain for long periods of time. Even local people living in primitive simplicity enable concepts to remain unchanged, and beliefs in myths have been handed down from generation to generation. Although there are few who have faith in new concepts, and some try to offer new ideas to Thai people in general society, they are still familiarities and beliefs in things that people already heard as children.

6.3.1.3 The perceptions of the Thai people deal with a variety of different levels of knowledge and experience. Within the areas of Thailand, there is division between Northern, Central, Eastern and Southern Thailand, wherein each area has different cultural beliefs and values and, despite differences not varying much, yet they are maintained, especially in varying traditions and cultures. Thus enabling the recognition of Thai people is a difficult task. In addition, levels of knowledge are very different, and even some areas of Thailand still lack a decent education. There are also tremendous differences in the gap between the rich and poor, which still remain very wide. This gap becomes wider as the rich become richer and vice versa. The poor, as a deprived majority, have less or no access at all to the high tech media. The task is very difficult to solve, and it will take a lot of time to solve such problems, needing careful consideration of the proper choices of periods of time as well as target areas for pilot projects. As a result, the perception of the Thai people as a whole is also different concerning each area of abode.

As the researcher has completed experiments; interactive media has been the principal tool employed. The analysis indicated and suggested what should be done in the future. It is not only museums that have to add interactive media as essential tools of presentation, but it are also how the museums can reach the public. In other words, museums must expand their policies concerning new groups of consumers; the ‘non-museum visitor’ museum must adapt itself to particular groups in this age of digital economy, wherein the digital media society and the online world is expanding rapidly.

At present, there are many social media groups, and each of them has unique interests, such as: automobiles, religions and Dhamma and etc. Museums need to develop progressive ideas, by expanding their roles into a new dimension. Museums must become a part of public education services, selecting
proper contents, devices and technology, in order to reach and attract the public, depending upon each groups’ particular interest.

The museum needs an “offensive strategy”. Amongst many kinds of media, it is necessary that making good decision-making to select the proper media is required. A viewer will be entertained, be inspired and enchanted, when seeing dramatized historical events, and this will make museum visiting more exciting. However, the museum designer also must take precautions, in that historical facts will not be distorted. In many cases, each individual impression and interpretation of the same museum presentation can allow two or more different versions of the same story presented and, for each individual; it is the visitor who has his own unique perceptions and responses. The museum has to make the most of proper learning experiences, using appropriate means and the surrounding environment.

### 6.3.2 Application of Installation Art Concerning the Exhibits in a Museum

In this living age of information, wherein computer graphics and other digital technology devices can offer various illusions under different circumstances, the real and unreal cannot easily be differentiated. Associate Professor Dr. Pairoj Jamuni said that “virtual reality is a new phase of the history of art-scientific achievement, used to depict the unreal and convince the viewer it is real and, that in terms of art, it is necessary to add flavor to attract the attention of the audience.”

Installation art can be modified and used as a part of any museum presentation. It should fix the case to make the story more exciting, and therefore furrowing must be completed. According to Mark Rosenthal, there are four key

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19 Interview with Baworawet Rungrujee, Director of Department of Fine Arts, Ministry of Culture and Phra Arjan Mana Wiriyathammo, The abbot of Wat Pa Soonyataram, Australia, November 9, 2012.

20 Interview with Pairoj Jamuni, The committee members of the Doctor of Philosophy Program in Design Arts, Faculty of Decorative Arts, Silpakorn University, October 27, 2014.

concepts which the museum exhibition designer has to do, those being the same thing as the installation artist:

First is “impersonation”, which in this case means what are the true intentions of the museum designer. Using this installation, sometimes the artist may not intend to find out the true profile of an historical article, but intend to convey another message. For example, he may want to create a dream world at the start (in order to convince the viewer to follow his own leads), or some rather evil artist may attempt to brainwash the viewer. There may be an historical article in one way, but he wildly uses all electronics media to convince such a story is something else, such as something sometime happened in the country within an authoritarian Thai government who wanted to convince a brainwash of people; that is, the courts cited that people were the real enemy, or that this was the town of a hero and it is historical fact, etc. Thus, after we part from this impersonation, the researcher thinks that the museum should keep a sense of truth concerning searches deeper into reality, rather than the brainwashing or making of unrealistic dream worlds of this and that kind of reality.

Second is “innovation”, which is a type of technology, used to create architectural or other structural arrangements, within which the visitor will be happy to enjoy visiting the museum. For example, the old conventional museum is where we simply walk in to a room and we see concealed glass cabinets containing artifacts, where there is not exciting at all to really see. In contrast, model museums may be constructed with mitigating appearances, almost as if we are about to enter a time machine. At one end it may open with the 12th century, using animated computer graphics to show visitors seaports of the U-Thong people, who spoke a strange language which was very different from contemporary Thai. There are temples which were never overruled in the past, which could also be temples used to exit a pagoda of the 12th century.

Third is “enchantment”, which is the use of installations that are always a key application of “Theater Arts”. Such as, in this case, if you want to build a dream world of the U-Thong in the 12th century, then you have to create a scene of that present, wherein time is a priority key. There may be some detail we do not know; for example, we may not know the exact real architectural styles from the times of the Duke from Dvaravati, or those of China or any other place as a matter of
fact, but we use the best sources of information to find in a way in which we can construct similar architectural styles and ancient costumes.

Fourth is “rapprochement”, which means we have to enter the mentality of the tastes of the people of the land to the reveal what they like or do not like. Then we try to make the museum’s exhibition into something that shares common values of spirit concerning the site of the museum, which in this case means the people of U-Thong.

The conclusion here is that there is another word “simulate” whereby one makes the computer graphics into “reality”, which enchants visitors to enter the time machine sense. According to Martin Lister stated that critical approaches to computer simulation tend to take a more nuanced attitude to the mimetic elements sometimes present in simulation. 22 Another is “emerging” into the situation, something rather similar to looking into a narrow window. Such a thing is very common in installations, because looking through this frame is paramount to walking into the ancient, as though walking into a new world of the time machine set 1400 years ago.

6.4 Recommendations

6.4.1 Suggestion for Field Experiments

The research itself involved the necessity to maintain extreme caution when working with ancient artifacts in a museum. This did not only include careful installation of electronic and heating systems, it also placed importance upon the demolition. The demolition itself must avoid causing damage to original spaces. This also involved any actions during content and techniques development, which was a risky period for causing impacts upon artifacts. This was because each artifact was of tremendous value, was invaluable and was irreplaceable. As a result, those who desired to bring in interactive media technology to collaborate with artifacts must place proper importance upon taking extreme care.

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6.4.2 Suggestions for Further Research

6.4.2.1 This experimental model was important for the creation of liveliness and new experiences for museum exhibitions concerning artifacts and art pieces. One could further use this model for other different cases, depending upon the type of ancient artifacts, contents and environments involved; for example, ancient sites in Thailand or other national museums, other types of museum or other branch offices of the National Museum, including national parks or other places of historical or cultural significant, or any place the organizer/museum authority intends to enhance new experiences for the site.

6.4.2.2 In the next research, the researcher intends to make it an innovative or explorative solution for solving Thai museum pre-existing problems. For a long time, a museum in Thailand has been viewed as a governmental building of various restrictions; this is something very different from museums in foreign countries, where a museum plays a vital role in cultivating national pride, social and cultural values; a type of school that children find an interesting place of learning. Such change is essential, and will only be made possible not simply by drastic museum development, but also cooperation of many sectors of government and private organizations. It is about the time that the negative point of view concerning Thai museums must be converted, from an unpleasant/undesirable place to visit to a true place of learning.

6.5 Chapter Summary

The researcher would like to make a conclusion that using interactive media applications to enhancing artifact in museum collections can be adopted and modified to suit the understandings and tastes of people, both foreign and native. They will get the best impression, inspiration and enjoyable learning experience from museums, which must not be a boring place but, more, an interesting place to learn about history, and something that can be applicable to life in the present. Finally, museums need to change; they should no longer be collection houses of antiques and artifacts, but living, interesting places for public education, as well as intellectual entertainment.

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**Veteran and Associated Lists**

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<thead>
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<th>Position and Details</th>
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Figure 103 Formal document ask to better information and photographs
Figure 104 Formal documents ask to select room for the prototype
Figure 105 Formal document ask to be supporters 10 projector
Figure 106 Formal document ask to participate as sponsors of funding and product
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