The Anatomy of Interface Design for Museum Exhibition: A Case Study in Malaysia

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Abstract: **Nowadays, with the rapid development of science and technology, new media is widely used in various industries and it promotes the exhibition and display into a new stage. Moreover, the application of digital technology in museum exhibition is not only has a great influence on the development of exhibition but also brings much attention on digital exhibition technology. Towards this most of designers for museum exhibition is overlook about the important of exhibition performance and further affected visitors' experiences. Within this point of view, a research was conducted in Malaysia by looking on the interface design within museum exhibition by focusing on the elements, types, techniques and characteristics.**

Keywords: **interface design; museum exhibition; interface anatomy; digital exhibition**

I. INTRODUCTION

Unlike a formal classroom that is relatively deserted of objects, most exhibition centres are packed with the sights and sounds of objects and media. Contrasting with the classroom where the learner remains seated and is exposed to one message at a time, the visitors to an exhibition centre is free to wander through an environment rich in sensory stimulation, where attention to one object or message may compete with another. In addition, in a formal educational setting, people are expected to learn (enjoyment is rare and not a necessary condition); while in an exhibition centre, one of the visitors' major goals is to enjoy themselves whether they learn anything or not. Consequently, given the complexity of the exhibition environment and the motivational goals of the audience, it is highly important to understand how these environmental components influenced and are processed by the visitor.

Nevertheless, there is no doubt about the important use of digital media content because the information can be easily distributed and shared. Traditional museum is commonly only allows participants to engage with objects on the museum's terms and limited by constraints of time and place. In the digital domain nowadays, these constraints apply differently, and engagements can take place over a wider time frame (Alivizatou, 2012). Yet, the use of digital media to represent the real ability of an objects in museum been argued by Hogsden (2013). In which was stated that the collaborations between the digital and real object will give a participatory experience to the museum visitors effectively. Moreover, at a museum, the interface design between the visitor and the museum collections was called as an exhibition where museum exhibition must communicate to the visitors deep to their mind and feeling (Lord, G. Dexter and Mayrand, 2001). In this sense, the exhibition works can be demonstrated as a medium of presentation with an effective element of interface design for the collections and research works.

Based on the previous literature review, it be found that the museum cannot rely solely on the use of digital media within the exhibition. Simply, in educating the visitors on authentic knowledge and skill, Robertson and Simonsen (2012) have emphasized that effective user interface design should involve a co-evolution of artefacts with practice because of the close relationships between object work and technology. In line with this understanding, Industrial Revolution 4.0 agenda in Malaysia was emphasized the importance of digital approaches for formal and informal educational institutions recently (Robandi, Kurniati, & Puspita Sari, 2019). Realized on the importance of interactive technology for museum institution, The Minister of Culture, Arts and Heritage of Malaysia have challenged the museums in Malaysia to comply and stand with another museum in the world (Saidin, Alwi, & Shaari, 2018). Regarding on that challenges, the idea of using interactive kiosk has been brought into Malaysian museums which offering different set of applications such as games, multimedia presentation, and interactive books (Nizar & Rahmat, 2018). Those interactive kiosks have taken place in Malaysian museums as an active and supportive learning tool by expecting to enhance the visitors' learning experiences.

Within this point of view, a research was conducted in a few museums across Malaysia by looking on the interface design within museum exhibition. This paper in particular is firstly extending the definition of interface design for the museum exhibition and further explaining on the interface design types for different exhibition's categories including interface design elements and characteristics.

II. DEFINITION OF INTERFACE DESIGN FOR MUSEUM EXHIBITIONS

Interfaces or Interface Design have a plenty of definition from the previous studies in technology. For example, Joo, Lee, and Ham (2014) have refers interface design to the use of symbols or command structures that be used in Human-Computer Interaction. Therefore, Phillips (2012) was defined that interface design is a part of interactive system and it works as a bridge that connecting between the

User and the System. Additionally, Cheon and Grant, (2012) provide a clearer definition by defining that interface design as the text and graphic layouts that appear on the computer screen. This was similar definition with Branscomb and Thomas (1984) whose claimed the visual appearance of a system is referring to the arrangement of content in terms of layout, colour schemes, icons, buttons and font sizes. Furthermore, according to Hiltunen, Laukka, & Luomala (2002), interface design consists of various functions for the device controlling and the menus in the device. With those all the definitions given however, for this research context at a museum, the interface design between the visitor and the museum collections was called as an exhibition where museum exhibition must communicate to the visitors. The sample of museum exhibition as per show in Figure 1.

Fig. 1: Sample of Museum Exhibition that performed as an Interface Design at the Museum.

Accordingly, the museum plays a role in maintaining the authenticity of knowledge about the history, beliefs, material, technical, process, and types of heritage products continuously. Those knowledges were presented to the museum visitors through the museum exhibition. In parallel, the theory philosophy of mind by Lewis (1994) was mentioned that the museum visitors will capture and remember the information from the museum exhibition as 90% by doing, 50% by looking, 30% by reading, and only 10% by listening. Towards the understanding of museum exhibition as an interface design, there are be defined that 3 broad categories of interface design for museum exhibition namely Standard, Virtual and Augmented. In particular, Standard is referred to the use of standard interfaces that commonly be using on digital application like keyboards and computer screen. While Virtual is when the interfaces is block out the real world to create a reality. An Augmented category moreover is when the interfaces does not block out the real world and creates reality. Thus, as interface design be used as a means of communication tool in various domains, the interface design of exhibition has evolved from the object-based presentation (Edson & Dean, 1994) to the information-based presentation (Ansbacher, 1999).

III. INTERFACE DESIGN TYPES FOR DIFFERENT EXHIBITIONS' CATEGORIES

In term of exhibition techniques therefore there are five techniques of exhibition established by the Department of Museums in Malaysia including Static, Interactive, Audio-Visual, Demonstration and Multimedia. Consequently, if compared to the established literature categories, it shown that commonly the exhibition techniques applied by the Department of Museums Malaysia are closely comparable to the interface design types of international literature which are Presentation, Conversation, Navigation and Explanation. In which, these different types of interface design have their own characteristics such as for interface design type presentation covered a static display unit with static text label as per traditional way of exhibition. In similar, the same characteristic was offered by interface design type explanation. On the other hand, interface design type conversation and navigation offered more interesting item that commonly required visitors to engage more with the object of exhibition. In particular, the summary of the data gathered according to exhibition categories and interface design types as per shown in Table 1 below and Figure 2 also show an example of exhibition categories in a real exhibition.

Table I: Exhibition Categories towards Types of Interface Design

Categories	Interface Type	Standard	Virtual	Augmented
Object Oriented Exhibition	*Presentation*	Static Replica Model	Sequential	Self-Movement
	Conversation		Sequential	Active Movement
	Navigation	Self-Running Display	Working Screen Button	Active Movement
	Explanation	Static Text Label	Interactive Text	Interactive Text
Information Based Exhibition	*Presentation*	Static Text Label		Film Projector
	Conversation		Working Mechanics	Barco screen Multi-screen
	Navigation	QR Code Scanning	Push Button Sound and light	Barco screen Multi-screen
	Explanation	Static Text Label	Interactive Text	Interactive Text

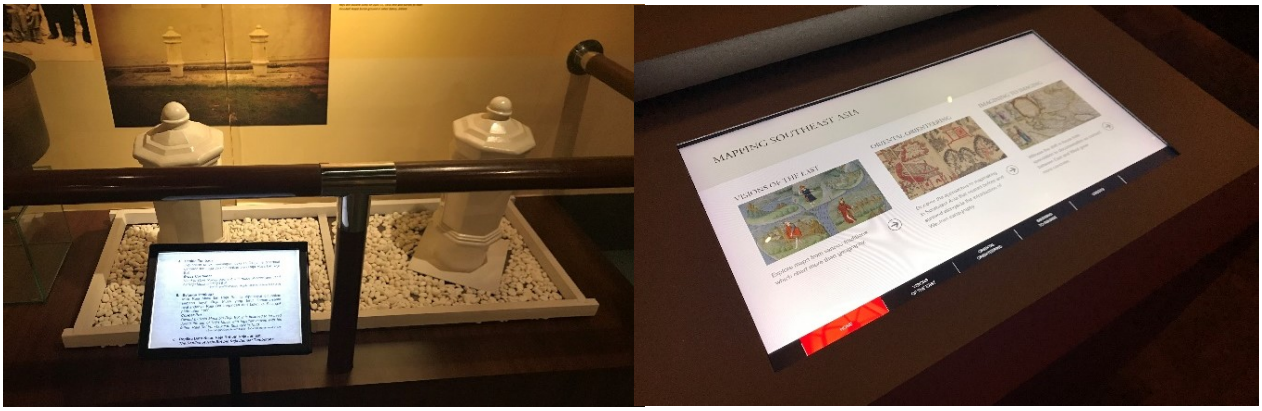

Fig. 2: Sample of Museum Exhibition Categories based on Object Oriented Exhibition (left image) and Information Based Exhibition (right image)

To understand in detail on the impact of exhibitions on visitors, we must understand which characteristics of techniques have the strongest impact on visitors. In detail, by referring to the techniques of exhibition explained in the Department of Museums Malaysia documents, a brief summary of the five techniques are presenting in Table 2.

Table2: The Techniques of Exhibition

Techniques	Explanation of the techniques
Static	• Art exhibits, picture materials, replicas, statues, manuscripts, mural photos. • Equipped with explanatory text or caption
Interactive	• The use of computer screens to create a working mechanism • The use of push button, laser movement, sound and light, • Direct information delivery • Visitor interact directly with exhibition material
Audio-Visual	• The use of radio, TV, Hologram, Barco screen, CD interactive, Film projector • Visitors will have a bigger explanation on the exhibition
Demonstration	• Holding a live demonstration • Visitor can engage and participate
Multimedia	• The use of technology tool to enhancing the exhibition • Combining multiple techniques and constructing variations in exhibition

IV. INTERFACE DESIGN ELEMENTS AND CHARACTERISTICS FOR MUSEUM EXHIBITION

Another important aspect contributing to the successfulness of each exhibition performance towards visitor's satisfaction is interface design elements. Although the use of design components in the form of physical or computer interactives and multimedia applications (in example: sound, video, and projection) helps the visitors achieve educational and entertaining purposes, it also provides a predetermined discourse for the successfulness of exhibition. Thus, each interface design elements should be design carefully to passes a real message to receiver which is a museum visitor. Interface design in particular, can influencing the accuracy of information and/or the conveyance of interpretation, and therefore impact the audiences' interpretation. Consequently, to understand the impact on museum visitors, understanding of designers on which characteristics of interface design have the strongest impact on museum visitors, and the qualitative nature of this impact is highly required. Table 3 provides a list of a few characteristics that are likely to have a significant impact on visitors on museum exhibition.

Table3: Interface Design Elements and Characteristics

Interface Design Elements	Practical Characteristics Suggested
Size	Larger objects attract and hold visitor attention better than smaller objects
Motion	Objects in motion are more attention-getting than static objects
Shape	Different size and shape
Texture	Different medium of material
Colour	Different colour use for creating different mode
Dimension	Three-dimensional objects usually draw more attention than do two-dimensional
Sense	Multi-sensory modalities (e.g., visual plus sound) increase more attention
Material	Suitability of material according to subject of presentation

Almost every museum exhibition contains some type of device or vehicle for presenting text information. In fact, exhibition that do not provide text information are frequently misunderstood by visitors. This further could affecting the visitors experience towards their visit to the museum. On the other hand, an effective design can strengthen the content but cannot take the place of it. So, with that well-prepared text, the placement of elements and texts are accepted as the most common mistake in a museum exhibition design. And as variety of the target audience of museum, audio visuals projection and giant graphics are added to the museum's design system. Towards these understanding, interface design elements also play its important roles.

V. CONCLUSION

Based on the existing knowledge about user interface design and empirical research study conducted in museum at Malaysia, this paper presenting a brief definition of interface design to help the curators of museum defining the term interface design for museum exhibition and to facilitate method development for designing and evaluating museum exhibition. As noted at the start of this article, by presenting a clear definition of interface design on museum exhibition, this paper is looking forward to seeing the Museum continue to fulfil its mission and to enrich the lives of those who visit it.

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