

Participatory Communication Referred to Meta-Design Approach through the FleXpeaker™ Application of Innovative Material in Exhibition Design

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Abstract

Modelling a communication system in material culture today always involves with objects, people, organizations, activities and interrelationships among them. The researcher suggests bringing together stakeholders engaged to exchange ideas, which the interactions relate to multiple professions and disciplines in a participatory scope of communication system. Owing to the invention of digital media, the status quo of images and sounds has revolutionized and caused changes of the mode of art exhibitions that produce activities and aesthetic concepts in terms of numerical representation, modularity, automation, visual variability and transcoding. Underlying a participatory-design approach, the research emphasizes a co-creative meta-interpretation of museum's visitors. In addition, the research delves further into the use of new media-FleXpeaker™ [ITRI], as the carrier. Combining art and design with innovative technology, the research focuses on examining design objects and innovative material which are applied in new media art and exhibition, in the hope to find new angles of participatory interpretation of the "integrated innovation" in curating an exhibition.

Keywords: communication system,
participatory design, exhibit design,
flexible speaker

1. Introduction

Intertwined within a participatory communication system nowadays, the invention of digital media has revolutionized the quality of images and

sounds. It has also changed the way of images and sounds in which they are contemplated, and the mode of art exhibitions that produce activities and esthetics concepts, because of the applications of "numerical representation, modularity, automation, visual variability and transcoding" in this new media age [1]. In fact, the reproductibility of digital technology leads to the hyper-real scenes where images and sounds are produced, copied and stimulated in a way that mimetic cannot be told apart from the original. Combining art and design with innovative technology, my research focuses on examining design objects and material innovation which are applied in new media art and exhibition, in the hope to find new angles of participatory interpretation of the "integrated innovation" in curating an exhibition.

The researcher emphasizes how to bring in museum's visitors' co-creation and meta-interpretation on the exhibition site. The research delves further into the application of certain a new media-FleXpeaker™ [ITRI], as the carrier. For instance, the social context and historical data are visualized and transcoded into specific images and life photography printed upon both sides of the surface of FleXpeaker™, as well as with sound effects to stimulate visitors' imagination of the events, the time and the underlying environment at the exhibition spaces in Sun Yun-Suan Memorial Museum in Taipei [2]. Therefore, the exhibition devices and design objects do help visitors to realize the significance of diverse elements of sounds, images and historical-documentary data in relation to its cultural-heritage representation.

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2. Method

This participatory communication study is based upon how to employ participatory design in the art exhibitions and museum spaces. As the matter of fact, much emphasis has been placed on design methods such as co-creation but even that has been largely limited to the involvement of visitors as participants. In addition, most of us get used to know the idea of hardware-oriented or professionally dominated design, so that we do think of visitors must adapt to the technology and the expertise must be shared with same background knowledge. However, the researcher would like to notify that museum's curators get to employ so-called "participatory design" during curating time which focuses on systematic exhibit development to envision context within design thinking and practices.

Fundamentally different from creating complete settled-up exhibit systems, the curators need to consider a defining activity for empowering participation, aimed at creating certain interactive design devices as the exhibits, for other visitors. In addition, based on the idea of "participatory design," through focusing on general exhibited structures interacted with visiting processes rather than on fixed exhibited objects and contents, the museum visitors may get deeper involved and achieve to the "world-as-experienced situated action" later engaged in the exhibit design system. Here we anticipate the participatory nature applied in exhibit design and the transition to more autonomous action for discovery by museum visitors. This method releases more power to the visitors to enhance their engagement while building up an exhibit system.

3. Innovative Electronic Material of Flexible Speaker

There are numerous technologies and products related to flexible electronics. Flexible electronics is sort of general term for using organic material, printing manufacturing process, Electronic Circuit, Optoelectronic Components, or the technology of setting on Flexible Substrate with low cost and the characteristics of being flexible [3]. In specific, the researcher introduces here the FleXpeaker™ as one kind of significant innovative electronic

materials. It developed by Flexible Electronics Pilot Lab of ITRI, Taiwan; FleXpeaker™ is one of flexible electronics applications, which helps ITRI received the Wall Street Journal's 2009 Technology Innovation Award [4] [5]. The technology utilizes paper and metal layers as the material with a thickness of less than 0.1 cm and uses standard printing for large-size paper-thin flexible speaker mass production. The great sound quality covers a range of 20 to 200 kHz. It is especially good for high-frequency sounds such as the chirps of birds and insects, where fidelity equals or exceeds that of conventional speakers [6].

In addition, the FleXpeaker™ uses only 10% as much power of conventional speakers, making it environmentally friendly. The new technology will bring the acoustic speaker industry into a brand-new era, and help create revolutionary consumer products such as memory cards with voice capabilities and ultra-thin MP3 players. It could even be incorporated into other products that are integrated into exhibit designs, green buildings, electric vehicles, entertainment and medical devices. The technology of FleXpeaker™ will help create new lifestyles and cater to the pursuit of personalized, social and cultural, as well as humanized applications [7].

4. Results and Discussion

For the pulse of the times and trends, the researcher would like to discuss how the curators has employed integrated innovation in exhibition design, since 2014, and delving further into the new media as the carrier in Sun Yun-Suan Memorial Museum, Taipei. New shapes of exhibition objects have served as communication media so that the images and sounds can be mixed used on the creations, and formed by projecting, framing, inlaying, attaching, hanging, and erecting (Fig.1). There are mixing of innovative technologies and devices installed in the exhibition room. For instances, the curator uses one ultra-short throw projector, hidden rightly in the rear of one piece of the glass-board, to deliver information that represents a virtual television screen on the glass (Fig. 2 & 3) . In fact, the device of the "Ultra-short Throw Projector" was developed by Delta Electronics, Inc., Taiwan.



Fig. 1 The diversity of exhibition sites at Sun Yun-Suan Memorial Museum in Taipei



Fig. 2 Using one “Ultra-short Throw Projector” to deliver information which was hidden rightly in the rear of the glass-board



Fig. 3 Representing a virtual television screen in the front of the glass-boards in the exhibit room



Fig. 4 Life photography printed upon both sides of the surface of paper-thin FleXpeaker™ to dedicate that Sun led Taiwan Power Company in restoring the power network in Taiwan

In addition, the curator introduces the economic-industrial contribution of the ex-Premier of R.O.C., *Sun, Yun-Suan*, who managed a staff of several hundred at Taipan Power Company, and was able to get 80% of the power network in Taiwan (destroyed during the World War II) restored in five months in the year of 1946 [8]. His biographical social-contextual data are visualized and transcoded into specific images and life photography printed upon both sides of the surface of paper-thin FleXpeaker™ (Fig. 4) as well as with sound effects to stimulate visitors' imagination of the events, the time and the underlying environment. Therefore, Sun Yun-Suan Memorial Museum came out the integration of arts-design-expertise in creating new exhibit experiences with technology.

5. Conclusions

Referred to the idea of participatory exhibit-design, the Sun Yun-Suan Memorial

museum helps its visitors to take part in the experience of converging sound, images and documentary data by mixing a series of contemporary innovative technologies and devices. The reproduction of contemporary sounds and images leads to the hyperreal scenes at the exhibition spaces in the museum where sounds and images are produced, copied and stimulated in a way that mimetic cannot be told apart from the original data. Just as “Simulations” of Jean Baudrillard [9], the digital visual communication media and digital interface changed into various ways and forms. However, it shows the hybrid of contemporary images and sounds. The creations are within the range of the Post-modernism, which stress on the interdisciplinary and inter-textual of semiotic translations.

With a collaborative multi-disciplinary schema, we have the comprehensive knowledge and means address to problems. Here the curators need to work with historians, visual designers, web developers, user experience designers, and information designers in order to enhance the exhibit design can be extremely powerful in creating the kinds of tools or vehicles that visitors will not only need but will be able to effectively use. There is critical to employing a meta-design framework, ensuring that the exhibit environment enables end-users to engage in informed participation. The communication system and devices developed in the exhibition should be integrated in consultation with those end-users, as museum’s visitors.

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