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Digital Multimedia Design Integration Model based on Experience Design

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ABSTRACT

The thought of experience design can create a digital media system environment that is in line with human life experience which can assist designers to plan their experience for the users, and shape the digital media system environment with experience value. The objective of this study is to draw an effective design method through the experience design thinking and to apply it to the development of digital media system. Through the well-designed overall environment, the user's emotional experience can also be met. By way of the discussion of literature theory, consolidation of the expert interviews, and 14 case observations, this study summarizes the design principles applied to the integrated development of digital media systems. The results of this study sum up 12 design criteria and propose a set of feasibility and reference value of the design method for the relevant designer's reference. The design principle gives design workers a clear design and implementation criteria to promote the designers (managers, executor, etc.) to have a clearer goal, enhance the design quality of digital media, and to create an environment that is focused on user's feeling and experience.

Keywords: Experience design, multimedia design, design principle, ease-of-use.

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INTRODUCTION

The concept of experience design is about how to meet the life experience perception with the user's expectation. From the forming of past experience, users can be aware of human life as part of the overall environment, and they can align their cognition with the designer's mind. Experience comes from the real life, regardless of traditional, nature science, off-line and on-line digital, or any other technology revolution, and is worthy of study Shedroff (2001). In the recent digital media system design development, the digital media system had transferred from information construction oriented into user experience oriented. User experience design helps the designer to create the journey experience in digital environment and making value of experience in digital media system environment, guide the user browse through design artifacts, improve the digital media system design quality, and make the user having more pleasant experience while uses the digital media system. The development of digital media system design needs to solve the problem of information overload, the search difficulty, and lost during browsing in the digital environment. Passively, the designer needs to reduce the frustration of user browsing experience with well-designed digital media system. Actively, great digital media system design need to create better user experience by increased user browsing behaviors and integrating the real time interactive characteristics of media system.

The purpose of this research is using experience design to develop a design methodology for digital media system development. Designers can design the overall system environment to fulfill the user cognitive experience by carefully arrange the information complexity and browsing style according to the user requirements.

LITERATURE REVIEW

The Information Design

All information disseminators hope that at the moment when people contact with the information, they can quickly understand the main points that the communicators want to express. Therefore, as to the designers, the work of information design has become an important issue. Wurman (1989) had discussed about the fact that information is generally defined as "(1) expression of view (2) the formation, shaping, training and learning of mind or character (3) the transmission of indicative knowledge" and the process of information conversion, including a series of analysis and design work on the data of decomposition, organization, transformation, as well as selection of presentation. It is indeed a series of analysis and design work. Wurman (1989) mentioned that: "The original data are not necessarily information, but only the information with the informing function itself is valuable. The information must be in a given form and put into practical use in order to become meaningful information" (p. 41).

Shedroff (2001) pointed out that the information is passed through a series of processes before it is converted into human wisdom, and the information is the first stage that is suitable for communication with the audience. Information can describe the message and reveal the association and rules between the data and the context, at the same time depicts the process of data conversion into wisdom (Figure 1). He believes that the data become information after integration, and then converted into knowledge and wisdom. As to the topics of information design, the book of Rosenfeld and Morville (1998) proposed that there are eight categories of information organizational methods applied to the site, namely in alphabetical order, in chronological order, in geographical order, in problem-oriented order, in task-oriented order, in the order for a specific audience, in metaphor and in comprehensive structure order (p.27-36).

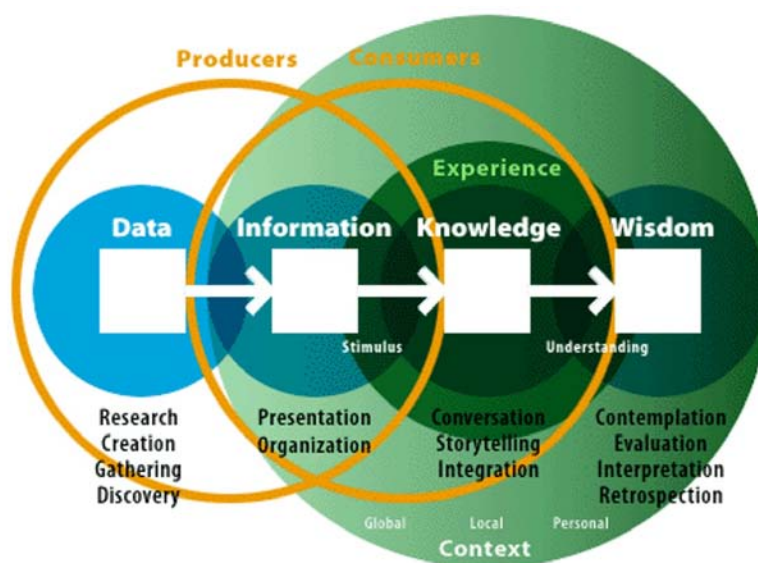


Figure 1: Information development history (Shedroff, 2001)

Interactive Performance

Different environments and different users have different needs, and human-computer interaction plays an important role in all kinds of information systems. The experience of the users on the web page becomes more important than the experience of the users on other products. The web page is a self-service product. There is no manual for the users to read in advance, and no one can help the user to browse the web page, only the user alone need to face the entire web page, and the user will have to rely only on his wit and experience to guide him (Garrett, 2002). On the definition of interaction, Fleming (1998) believed that it is "the exchange of two or more people in the concept, emotion, object or language. It is even so in the use of the computer, and only the computer is the technology media for the communication between them (P. 73).

Kristof and Satran (1995) pointed out that interactive design is the introduction of information into experience and can be achieved in several ways: through the clear guidance and selection to give users the motivation to experience; provide a clear path or create an interesting course; to help the users to go to the places they want to go or to do things they want to do; let the experience be easily acquired by intuition. The characteristics of interactive media, Shedroff (2001) put forward a different interpretation. He believed the characteristics of interactive media can be summarized as feedback, control, creativity, productivity, degree of communication, and fitness six categories. The interactive design of the above six types of features can produce a good interactive experience and make the design work valuable.

Interface Design

HCI (Human-Computer Interaction, HCI) is the process, dialogue and action that the users interact with the computer (Baecker & Buxton, 1987). Booth (1989) defined HCI as: "the HCI is the interaction between people and computers". The user interface design is mostly focused on the interface of the hardware (Grudin, 1990). With the development of the computer technology, it is gradually evolved from the program operation to the visual operation (Gentner & Nielsen, 1996). The GUI (Graphical User Interface) is one of the HCIs that allows visualization icon, visual display and specific graphical elements to interact with the interface. The GUI allows the users to easily understand their meaning and use them (Hsu, 2013). GUI is the use of visual images to construct the interface, so that the system and the user can communicate through the visual message. For the user interface design principles, the results of the study are summarized in Table 1:

Table 1: User design principles organized by the study

1.	Laurel (1990)	1. User-oriented design 2. Uniformity 3. Consistency 4. Help information 5. Immediate feedback 6. Graphic capabilities 7. Multiple views 8. Undo and redo
2.	Nielsen(1993)	1. Visibility of System Status 2. Match Between System and Real World 3. User Control and Freedom 4. Consistency and Standards 5. Error Prevention 6. Recognition rather than Recall 7. Flexibility and Efficiency of Use 8. Aesthetic and Minimalist Design 9. Help Users Recognize, Diagnose, and Recover from Errors 10. Help and Documentation
3.	Norman (2014)	1. Discoverability 2. Feedback 3. Conceptual mode 4. Affordances 5. Signifiers 6. Mappings 7. Constraints 8. Emotion 9. Beauty 10. Pleasure

With regards to interface design, Shedroff (2001) presented in experience design that the interface design is one of the many projects that will be used in the shaping of experience. On the interface of the design elements, Kristof and Satran (1995) believed that they should contain the following elements: background, windows and panels, buttons and other manipulation devices, images, text, video, sound, and animation. With regard to the overall interface design considerations, some of the viewpoints by Powell (2000) were summarized as follows: 1. Direct control: the users will want to be able to control the activities of the computer. The only drawback is that in the environment where the information is transmitted on the website may be difficult to control directly if the response is too slow. 2. Should be able to identify at a glance without having to remember or enter in: the interface should allow the users to rely on identification, rather than memories. Because the users may browse many websites, we should provide clear options for the users to easily identify, rather than rely on memories. This is the part where the site designers need to pay attention to. 3. Overall beauty: the interface should be clear and attractive. Design style should be consistent, but different objects need to be significantly different. As for the web, if the appearance of the site is not very attractive, then it is vulnerable to the user's criticism. 4. User control: give users the control of the computer, and let all the actions be driven by the users and controlled by the users. In the real world, we also need to give the users appropriate guidance for browsing when interacting with the web page.

METHODOLOGY

This research had done the literature review by collecting the expert interviews and case observation (14 case studies) to find the design principles that apply to digital media system design. These principles then form the experience design methodology to guide the user for better experience of accessing the system. The 14 experts in this research all have good practices in digital media design area. The designers have master or doctoral degrees and execute projects or have at least 3-year actual experience in digital medial design experience in the real world.

Research process

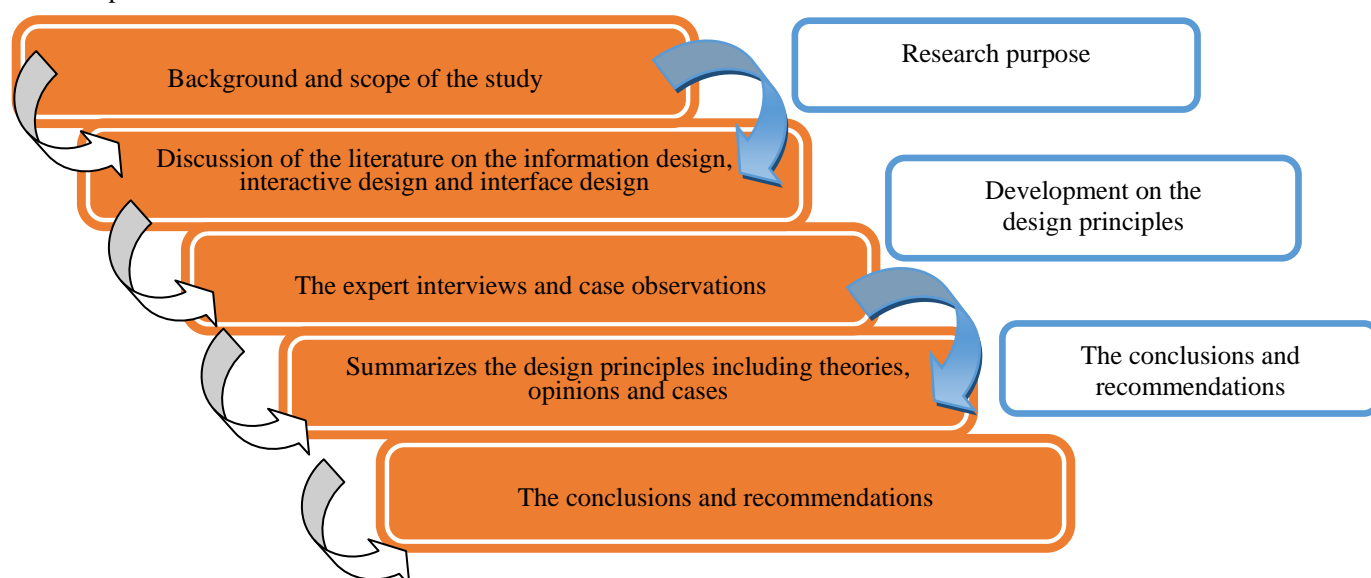


Figure 2: Methodology of this study.

Firstly, we identified the study objective and major research area on the experience design point of view and in the field of digital media design. Secondly, focused the research background mentioned above on the information design, interactive design and interface design to analyze theories in the literature. Thirdly, interviewing experts through underlining the issues in the literature, and to consolidate such opinions and case studies. Fourthly, summarizes the design principles by way of the discussion of literatures, experts' opinions and case observations. Fifthly, the results of this study sum up design criteria and propose a set of feasibility and reference value of the design method for the relevant designer's reference.

RESULTS AND DISCUSSIONS

This research had found 12 design principles which can be categorized into three categories: information structure, interactive response, user interface. Through the research process, the results of this study summed up 12 design criteria, which is divided into three major items: information structure, interactive performance, and interface presentation.

Table 2: The 12 design principles

A.	Information structure:	this is the prerequisite of the overall design. A series of analysis and design work, including the decomposition of information, organization, conversion, and the choice of presentation can only become meaningful information after given a form and put it into practical information.
	1. to achieve communication objective:	convert the data into valuable information, and then convert again into knowledge and wisdom. When passing the message, the less the error, the more it is able to achieve the communication purpose between the designer and the one he tries to communicate with.
	2. to promote easy understanding:	the design should try to improve the interpretation and absorption ability of information by the recipients of the information. It should pass the information to the users in a way that is systematic and easy to read so as to allow the users to have better understanding.
	3. a well-constructed site organizational structure:	it is proposed to use "the organizational approach" and "the structural approach" these two methods to achieve information composition. In terms of practical experience, it may be having the structure of the site first and then build the information according to such structure, or in the process of reorganizing the data, gradually forming a digital media structure. The organizational approach and the structural approach should have overlapping parts in the implementation of the two.
	4. to use and manage:	we should pay attention to the correctness of information and the legitimacy of use, the expansion and the management of the site information, the user surveys and test feedback, update the information with timeliness etc.
B.	Interactive response:	digital media interactive design on the computer technology applications is developed from the real world experience, so that ideas, emotions, objects, or languages are exchanged in an interactive way. The design criteria are as follows:
	5. it should be user-centered:	which means it should give users the rights of choice, control and autonomy. During their process of the information searching, it should also create an interesting process to help the users to have the motivation to experience more, and at the same time make the experience easy to be obtained by simply following their intuition.
	6. sceneries oriented:	which should include media features, use of hardware and software technologies, performance arrangements, as well as the users operating sequence and other factors.
	7. proper interactivity:	the interactive design in the digital media design field has an important advantage, which is very different from the printing, film ... etc. one-way transmission media. Moderate use of interactivity will not only make the users to enter the system more quickly through their own intuition, but also the familiar mode of the operation will also accelerate the user's absorption of the content, while the excessive interactive will easily make the users to be confused, due to too many excessive stimulations are offered to them.
	8. easy to operate:	the interactivity is a considerable help to the users during their operation and browsing of the system which is in line with the needs of users for facilitating the operation and the receiving of the message that the digital media tries to present, especially in the configuration of color presentation which can achieve the functions of information distinction and highlight focus. It will also affect the user's willingness to click if the environment meets the circumstance of easy to operate.
C.	User interface:	user interface is the visual presentation of information design and interactive design. It is also the most direct and important browsing experience of the visual impression when the users access to the digital media. The design criteria are as follows:

9.	the overall design presentation:	through the integration of design elements in the interface, it can promote positive contact between the users and the system.
10.	User acceptance:	The design should consider the practicality, beauty, and also to be in line with the user's convenience as well as fluency in order to obtain more users approval.
11.	intuition and consistency:	this will help the users to remember and operate easily, without having to spend much time in learning.
12.	to provide the right and easy operation:	which will help the users to identify the location, get the information they want to browse, and when the content is rich, clear navigation planning and clear tips are particularly important.

CONCLUSION

The objective of this research is to propose a workable and referable design methodology for designers, based on the experience design point of view and in the field of digital media design. In this study, the selected experts we interviewed are professional designers (a total of fourteen designers), who all have a wealth of experience in the digital media design field. The designers all received a master's degree or above in the related field and all have the project implementation capacity, or senior in a high-level position with practical digital media design experience for more than 3 years. Through the discussion of literature theory, the experts' interview, and the case study (14 cases), this paper summarizes the experience design applied to the design principles of digital media system integration and development, and sums up the design method of "shaping the experience environment and guiding the users to obtain information".

In the process of summarizing the literature, it is found that some of the concepts of the scholars are similar. Therefore, trying to reorganize and then merged the repetitions or similarities in the literatures. After choosing the rest important points of view and summarizing three major directions as follow: (1) information composition, (2) interactive performance, (3) interface presentation, we then once again collected and integrated these directions and case observation, as well as the expert advices.

Through the above research methods, the results of this study summarize a total of 12 design criteria as follow:

(1) The information composition aspect:

1. To achieve the purpose of communication.
2. Promote understanding.
3. Organizational structure.
4. To use and manage.

(2) The interactive performance aspect:

1. User-centric.
2. Situation considerations.
3. Proper interactivity.
4. Easy to operate.

(3) The interface presentation aspect:

1. Presents the overall design.
2. Obtain the user's approval.
3. Intuition and consistency.
4. Provide the right and easy operation.

This study also found that such a design principle gives the design staff a clear design and implementation guideline to enhance the designer (the managers and/or the executors) to have a clearer goal which will help the smooth execution of design workflow, and enhance the quality of digital media design, to guide the users to easily obtain information, create the environment which focus on user feeling and user experience thus promote the user experience in their tour experience. It is also easy for the users to absorb the digital media information during their operation, and can also feel the experience that digital media tries to convey.

The limitations of this study are several as follow:

- (1) When access to the design guidelines of this study, it should be based on a comprehensive and complete design considerations with careful planning so that the design quality of the digital media system can be guaranteed. Therefore, it requires a longer execution time and cost in the process period, thus time and quality will be the trade-offs of designers or managers.
- (2) As a result of the proposed design approach, it is our choice to choose the digital media sites as presentation media. As for other digital media forms, the follow-up researchers can target different digital media carriers for further discussion.
- (3) For future research, it is recommended that this set of design methods be available as inference to other features of presentation in response to different modular production according to different themes, or different types of design, for example: to apply in the digital museum design, the medical system design, the urban map design ... and so on. After more

empirical researches are produced, the digital media design can pay more attention to user experience, and to guide users tour smoothly in a digital media surrounding.

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