

Exploring the Human Computer Interactive Design--- Interactive Billboard

Ju-Yuan, Chen. Carol Liao

Department of Visual Communication Design, Jinwen University of Science and Technology, Taiwan

jullian@just.edu.tw

Abstract

The messages of advertisement are ubiquitous, its images and words are like air that filled in every corner of our living environment. Advertisement and our living are interrelated, because the culture and features of one nation can be understood by the presentation of advertisement. The visual effect of advertisement is presented in various ways. Due to the impact of Digital Technology, the concept of interactive design and multi-creativity, the visual arts in advertisement billboard will be creating much more surprising possibilities.

Unidirectional advertisement that tried to communicate message in persuasive manner is no long effective in these recent years and advertisement that develops two-way communication is what most needed at this point. As the era of digitalization is approaching, “interactive” technology is indispensable; however, the interactive advertisement in public occasions is still at its initial stage, there are merely a few successful cases. What kind of effect can be produced by Interactive billboard at public occasions? How is its content and message presented and communicated? These are the issues and questions that are worth exploring and studying.

The interactive feature that digital technology brings provide traditional billboard with distinctive “game” feature. It manipulates curiosity, which is a trait in human nature, and allows audience to have a deep understanding on product presented. From interactivity to game, it becomes the main element that enhances the efficacy of advertisement marketing. Currently, advertisement billboards in Taiwan are mainly printed in 2-dimension format, interactive billboard is rarely seen. When reviewed Taiwan traditional cases, most of them are considered as creation of interactive devices, and in foreign countries, gradually there is more interactive design used on the billboards. Therefore, the purpose of this research study is to explore and discuss the design and interactive modes of interactive billboard in advertisement; understand the process of designing interactive billboard; and evaluate the efficacy of interactive billboard.

Key word: interactive billboard, interactive design, human computer interactive design.

1. Introduction

The messages of Advertisement are ubiquitous, its image, words, messages are like the air we breathe, filled in our living environment. Advertisement and our living are interrelated, because the culture and features in one country can generally be understood from its advertisement. An excellent advertisement can attract consumers' perceptual attention. Huang Wen Bo, a well-known advertising designer in Taiwan, once addressed in his book (Regarding creativity, I have comments) that the two functions of creativity is to "attract attention" and "strengthen message"¹. Generally speaking, both of these functions are trying to express the same purpose. However, in the consumers' perspective, advertisement is not only commercial messages, but also includes various interesting and cheerful experiences which worth viewing repeatedly. These experiences are the key that attracts attention.²

When consumer purchases merchandise, there is a series of 5 decision-making processes, which is abbreviated in the term "AIDMA": Attention, Interest, Desire, Memory, and Action.³ Advertisement is a kind of persuasive activity that is presented via copy writer, concrete object, image, photo, etc. By presenting them through the Mass Media, it attracts consumer's attention and interest, touches consumers' heart and affects consumers' intention.⁴ The purpose of most advertisement is to market or sell products; thus, many people have negative impression on advertisement, and subconsciously repel to receive its messages, such as messages from mobile phone, email, etc. In most cases, the messages are ignored or deleted before the content is completely read. Unidirectional advertisement that tried to communicate message in persuasive manner is no long effective in these recent years and advertisement that develops two-way communication is what most needed at this point. As the era of digitalization is approaching, "interactivity" is the basic essence of digital media. When reviewing the history of human life experiences, there was no time in the past that had such large amount of advertisement messages like today. Regarding advertisement, maybe consumers were once attracted, but were easily forgotten afterwards. The messages that advertisement presented are already disappeared in consumers' mind.⁵

Billboard is an advertisement style and media that displays in public areas. Huang, Jia Lin thinks interactive advertisement should provide consumers the opportunity to choose and adjust the content of messages. Through the interactive media, one can respond to the advertisement.⁶ There are various forms of presenting the design of billboard. As the era changes, and due to the development of digital technology, interactive design and multi-creativity, it creates many more new possibilities for presenting the arts of billboard. By using the features of interactive visual-audio device, consumers can interact with the creation and have a more perceptual experience that is not purely visual experience. The interaction can increase consumers' interest and strengthen their impression of advertisement.

In the movie "Minority Report", the director, Steven Spielberg, has described a future world that is filled with interactive billboard. When pedestrian passed by, the billboard would call out pedestrian's name and present a personalized advertisement. Such scenes gave us insight on the possibilities of future advertisement. However, the billboard in public area is still in its initial stage, what kind of interactive effect it will produce at public area? This is an issue that worth researching and discussing.

Interactive is the new feature of technological arts, users can operate according to their own will, and then they can establish their own creation. The continual development of information technology stimulates many more new patterns of interactive game device. The emergence of digital media, consumers can involve in the game device via an interactive manner. Through the new combination of technology and various scopes of resources, and through the interactive device, users can interact with the digital resources which enable them to have a better understanding on designer's creative idea. The design of device is usually based on the thinking process of human being; the purpose is to encourage the interactive participation where users have the right to choose for their needs and answer

Information designer, Screven once addressed a type of reciprocal mode.⁷(Figure 1)

- (1) Information Location: the information that presented in the specified area.
- (2) Message: the idea, affection or product that are trying to communicate.
- (3) Display: the hardware that is used during presentation.
- (4) Media: the channel that communicates to audience, such as image, sound, words or light.
- (5) Audience: users that participate in the process.
- (6) Message that is received: messages received by audience through the creation.
- (7) Action: Reaction or feedback that is given by audience who have received the message.

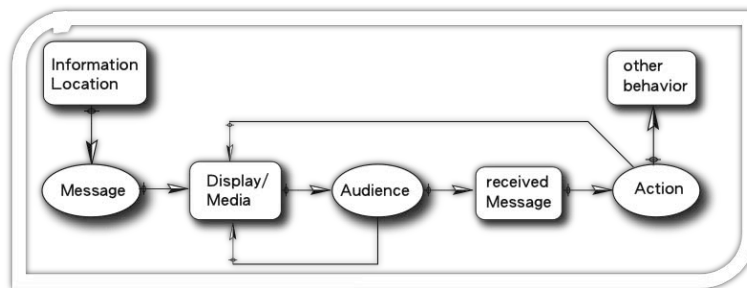


Figure 1. A type of reciprocal mode(Screven 1999)

2. The Definition and Presentation of Interactive Billboard

(1). The Definition of Interactive Billboard

Georgescu, CEO of a well-known Advertisement Company, Young & Rubicam, assumed that “interactivity” is one of the most crucial factors in Mass Media, because this is the world that is driven from social relationship.⁸ Robert Schmetterer once claimed that “Interactivity is at the center of where advertising is going”, and he pointed out how advertisers have changed their view to a more interactive and globalized view;

First: inactivity is not just representing a new media, but it means an overall concept (including academic and practical) in the complete advertisement industry.

Second: the concept of interactivity has gone beyond the traditional boundary of Media, which includes the complete scope of human activity. Thus, author hopes to discuss how the interaction of human and advertisement deepens the experience of advertisement and how the message of advertisement gets received, noticed and understood.

Regarding interactive advertisement, many scholars have addressed many related definitions and theories. “Interactive advertisement”, Steuer (1992) defined it as when users are able to instantly participate and alter the pattern or content of media.⁹ Skuba(1996) claimed that interactivity is achieved only when users are required to engage in reciprocal communication with advertisers.¹⁰ Hoffman and Novak considered that marketing via interactive media is reciprocal communication, which includes interaction with machines or other individuals.¹¹ Through the interaction with machines, consumers can actively choose an advertisement message, and have the rights to control its content. Through interaction with other individuals, consumers can communicate with advertiser and other consumers. On the other hands, Roman(1996) proposed that the advertisement which is transmitted from interactive media may not necessary be an interactive advertisement, because a real interactive advertisement should provide options for users, who can adjust the content, and via the interaction with media, advertiser can provide relevant responses. Therefore, after scholars have defined the concept of interactivity, “interactive advertisement” has the following features(Figure 2):

- A. The participation of consumers: the consumers follow the mechanism of reciprocal communication and engage in operation, which produces the effect of advertisement.
- B. Customized Presentation: the operation of interactive advertisement is reciprocal communication, so that every consumer produces different result, so the advertisement is presented in a customized manner.
- C. The Purpose of communicating advertisement: the nature of interactive advertisement is advertisement itself, thus, the transmission of messages are closely associated with the above two points. Besides attracting consumer’s attention, it can also bring out the message it trying to present.

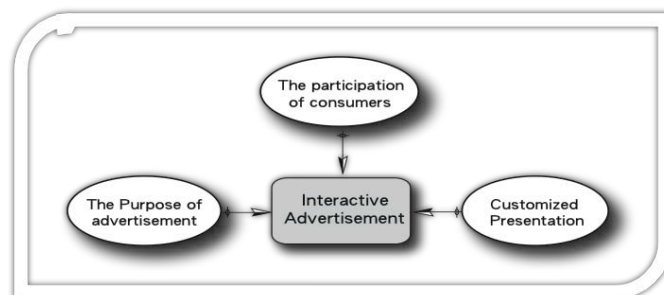


Figure 2. The features of interactive advertisement (author drawing)

(2). The presentation of Interactive advertisement

The traditional presentation of interactive advertisement that is most often seen includes telephone marketing, face-to-face marketing, email advertisement, etc. Nowadays, the presentation of interactive advertisement includes using internet as an agent for internet advertisement; using wireless technology for mobile advertisement; interactive TV advertisement that is still in development; and advertisement that is in public area, etc. Therefore, the presentation of interactive advertisement will make a breakthrough as technology is continually making improvement and the new presentation style of interactive advertisement is gradually being explored. For instance, the interactive advertisement lab in MIT has organized many presentation methods that are through the combination of new technology and advertisement.¹² Also, they have organized various related documents from the past and present that have valuable application or the future; they have also given a new definition on interactive advertisement. They have categorized them as Interactive desktop advertisement, interactive wall advertisement, interactive billboard and TV game advertisement, etc.(figure 3-6)



Figure 3. Interactive desktop advertisement



Figure 4. Interactive wall advertisement



Figure 5. Interactive billboard



Figure 6. TV game advertisement

(3). Human-Computer interaction Mode

Human-Computer interaction means the interaction between users and computer when users are using computer for certain work process.¹³ Knstof has defined human-computer interaction as: the behaviours that are produced between human and computer.¹⁴ Interaction mainly involves the communication between two parties, which are “user” and “media”, in which “user” is trying to alter the content presented by the media according to his or her

interest, whereas “media” needs to provide different contents and variation in order to attend to users’ needs. The emphasis is that the interaction between the two parties is to achieve a certain purpose together. Interaction does not mean animation, images, sounds, but it refers to the users’ operation and the dynamic experiences. Therefore, the definition of interaction involves various types of media and presented in a digitalized format, allowing users to have certain level of interaction. Additionally, in the field of human-computer interaction, how human can naturally interact with the computer in a humanized way is the current issue that gradually gets everyone attention. Since keyboard and mouse are not humanized operation where people are required to learn to operate, many researchers are exploring the interaction mode of human being or the interaction that is based on natural intuition.

The following is the discussion on Human-Computer interaction mode and its case studies, the discussion is divided into 3 sections.

- A. Human directly interacts with media through body movement.
- B. Human indirectly interacts with media through another object, such as mobile phone.
- C. Human-computer interaction through heat responses.

A. Human directly interacts with media through body movement

(1) H-P-M Interaction mode

From the perspectives and interaction between human being, objects, environment, spaces and media, Keichii and his associates proposed H-P-M interaction Mode¹⁵ (as Figure 7). They stated that object is a concrete entity which has the same feature as media, so users can interact with the abstract information via the operation of the concrete object; interaction is achieved through the combination these two parties. Similarly, abstract information can go beyond computer’s limitation, assisting and enhancing daily experiences. Audience can interact with the content that is displayed in the media space through various behaviors, such as body movement, gestures and touches, etc. The changes that happen in the media space can provide users with feedback, allowing users to be motivated and actively engaged. Via such cycle, information is continually interacting.

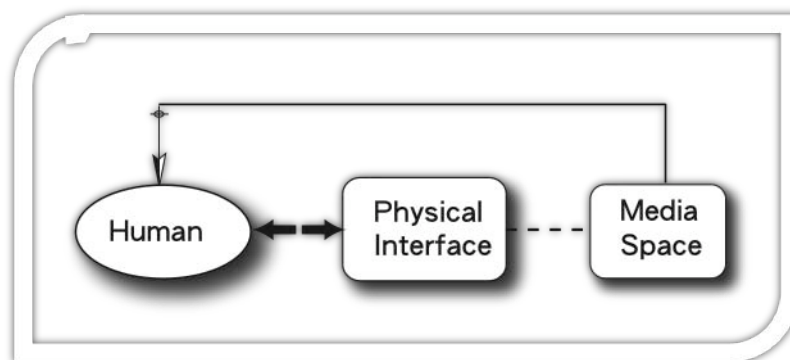


Figure 7. H-P-O-M mode (Keiichi Sato, 2000)

(2) Humanized Interaction Mode

Humanized Interaction Mode provides a new direction and trend in interaction between computer and human being, humanization is the starting point that triggers this idea. From the relationship between cognitive space, object space and abstract space, Jeng illustrated the idea of Humanized interaction. In cognitive space, users triggered the matters that are in abstract space via the operation of object.¹⁶ The change in abstract space will respond to users' perception through object space. In the research of humanization interaction, users transmitted their response through initiative way (such as gestures, touches, movement), then computer identified and decoded the input received. The idea of humanized interaction allows human-computer interaction to be more natural, flexible, more concrete and influential. Following is the case studies related to Interaction mode.

Camille Utterback displayed a well-known case, "Text Rain" at Museum of Contemporary Art of Taiwan. This is a typical case which interaction is achieved through body movement. As shown in Figure 8, the image of human is captured in the video camera and is projected on the flat surface, and there were letters falling down like rain, then letters that touched the edge of body image will be blocked from falling down. Letters that were falling down are actually separated from real words, so viewers could block letters from falling down and grouped letters back to real words. Thus, such an interesting creation allows people to explore their own body image while interact with abstract words, and the interaction also included readable messages.



Figure 8. The interactive artwork of Text Rain

A company in Canada, "Freeset Interactive" has developed a "Human Locator Technique", which allow advertiser to create an interactive billboard, which the content is altered according to the location of users. Example is shown on Figure 2, the model appeared on the billboard would change his/her postures depending on the location of viewer. The other example is from an automobile advertisement. When individual is entering this space, automobile on the billboard will appear in front side, and according to individual's footstep, the image of automobile would display in different angels. Similar to the concept of animation, when individual left the space, the image of automobile would spin once and disappeared. Furthermore, when individual was closer to the billboard, the image would zoom in and zoom out vice versa.



Figure 9. The model appeared on the billboard would change her postures depending on the location of viewer.

B. Human indirectly interacts with media through another object, such as mobile phone

To expand from H-P-M interaction mode, there is H-P-O-M mode, O represents objects, which refers to the interaction between object and interface, so that user can indirectly receive and alter media space and H-P-O-M mode(Human-physical Interface-Object-Media Space)¹⁷. Also, through the operation from the interface, user can interact with object in distance, and have various forms of interaction.

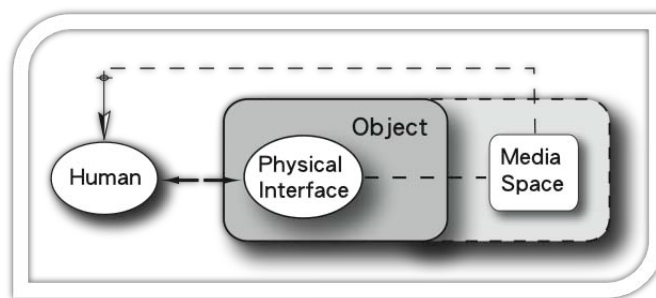


Figure 10. H-P-O-M mode (Keiichi Sato, 2000)

In October 2004, a huge interactive billboard appeared at New York Times Square, the advertisement was “Dove” scented soap, which is manufactured by UNILEVER.¹⁸ Advertiser has designed a theme to be displayed on the billboard which is to discuss “What is beauty?” They allow pedestrians to vote via sending message from their mobile phone. For example, if the theme is to discuss “Can society accept “old” as a kind of beauty”, the billboard would display a series of images from a young model to a 96 years old lady. This allowed viewers to decide whether she is “full of wrinkles” or “perfect”. This was the first time where view can vote via their mobile phones, and displayed the result publicly. As in Figure 3, in July 2005, the advertisement of Dove also had the same design in presented at the urban cities of Northern, Central and Southern Taiwan. By send a message via mobile phones, votes were accumulated and displayed on the billboard.



Figure 11. The Interactive billboard of Dove

C. Human-computer interaction through heat responses

The ministry of Traffic Safety in New Zealand promoted an advertisement on toilet in 260 Bars, hoping it could admonish man not to drive after drinking. This advertisement had been displayed at the toilet, and it is through heat sensor which triggered the images. At first, there were two black and white images, but after it is heated, an image of a damaged car (Message: If you drink and drive, you are a fool) and an image of a perfect car would appear (Message: If you didn't drink and drive, you are a legend). Hopefully, the interactive advertisement can catch people attention and decrease the number of people who are injured or killed by drink and drive.

4. Conclusion

The interactive and visual-audio device is not only providing audience with visual experience, but perceptual experiences, which increase the audience interest and approval. The interactive design of technology and arts and its devices are starting to apply in various mass media and internet network, even commercial application. In the future, a more humanized and intuitive way of operation will soon appear. Billboard exist in the public area, people rarely stop and spend time reading its content, so applying interactive technology on billboard make it easier for advertiser to transmit their messages to the audience. Interactive billboard can be beneficial in many aspects, such as increasing attention, comprehensiveness, audience's interests and intention. Interactive media brings in a lot of innovation in the advertisement industry which increase their effectiveness and marketability. Due to the continual development in digital technology, concept of interaction and variety of billboard design, one can see the development of interactive billboard is full of potential.

The concept of interactive design is accompanied by the development of digitalization and it is considered as one of the main economic and academic development in certain countries. For example, from 1979 to current year, electronic Arts center of Austria has archived various electronic artworks from all over the world. It has become a well-known exhibition of electronic arts design. Sweden has established a national interactive research center, which has proposal on studying the application of interactive design in environment, product design and exhibition design, etc. Others as Media experimental lab at MIT, Human-computer interaction Institute at Carnegie Mellon University, Human-computer interaction research Division at Cornell University, and also the Digital design college in Coventry University, etc. Interactive design has become the trend of today's research and exploration.

Huang Chun Ming, a well-known advertising designer who was once worked in an advertisement company, said: Advertisement is not only in the scope of economy, it has produced significant effect in culture... , it is not wrong to say advertisement is a kind of underground education¹⁹. Technology is continually developing and advancing, there is still plenty of possibility in applying computer technology on interactive billboard. The technology in Taiwan is well recognized, but when compared with other countries in Europe, America and Japan, the application of Taiwan technology on interactive billboard is not yet evident. As technology is continually developing, the future organization of related technology and the education of advertisement should be the areas that all related professions should put effort on.

Endnotes:

-
- ¹ Huang, Wen Bo. Regarding creativity, I have comments. Bookzone Co., Ltd. 2004. P-22
- ² Chen, Wen Lin. Advertising magazine, Rocking Cultural Co., Ltd, 1999
- ³ Shu, yeong Fuh. Advertising, Lungteng Cultural Co., Ltd 1989
- ⁴ Runde, A. S., The Challenge of Internet explosion: ideas for staying ahead of the users.
- ⁵ Sun Xiu Hui, Ping Jian San. Advertising Culture, Yang-Chih Book Co., Ltd. 1998
- ⁶ Huang, Jia Lin, A Study of Designing, Implementing, and Evaluating of an Interactive Billboard, Master thesis, National Taiwan Normal University , 2005.
- ⁷ Screven, C.G. Information design in informal settings: Museums and other public settings. In Information design, ed. Jacobson, R., 131-192. Cambridge, MA: MIT Press. 1999
- ⁸ Georgescu, CEO, Young & Rubicam. Advertising Age, April 14, 1997
- ⁹ Steuer, J. Defining virtual reality: Dimensions determining telepresence. Journal of Communication, 42(4), p73-93, 1992.
- ¹⁰ Skuba, C. Web site vs. web session. American Advertising, 12 (1), 22-23,1996.
- ¹¹ Hoffman, D. L., and Novak, T. P. Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundation, Journal of Marketing, 60 (3).
- ¹² Vedrashko. MIT Advertising Lab . <http://adverlab.blogspot.com/>, 2008
- ¹³ Johnson, B. It's just the future. Advertising Age, 71(16), 8+. Retrieved January 16, 2001
- ¹⁴ Kristof, R. & Satran, A. Interactivity By Design. Mountain View, CA:Adobe Press. 1995
- ¹⁵ Keiichi, S., Youn-kyung, L. Physical Interaction and Multi-Aspect Representation for Information Intensive Environments. Proceedings of the 2000 IEEE International Workshop on Robot and Human Interactive Communication, pp.436-443, 2000.
- ¹⁶ Jeng, T., Lee C., Chen, C.& Ma, Y.P. Interaction and Scoial Issues in a Human-Centered Reactive Environment, in Proceedings of CAADRIA 2002, pp285-292, 2002.
- ¹⁷ Ibid 17.
- ¹⁸ campaign for real beauty. Dove . <http://www.campaignforrealbeauty.com/>, 2007
- ¹⁹ Ibid 5.

Preference

Chen, Wen Lin. Advertising magazine, Rocking Cultural Co., Ltd, 1999

Georgescu, CEO, Young & Rubicam. Advertising Age, April 14, 1997

Hoffman, D. L., and Novak, T. P. Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundation, Journal of Marketing, 60 (3).

Huang, Jia Lin, A Study of Designing, Implementing, and Evaluating of an Interactive Billboard, Master thesis, National Taiwan Normal University , 2005.

Huang, Wen Bo. Regarding creativity, I have comments. Bookzone Co., Ltd. 2004. P-22

Jeng, T., Lee C., Chen, C.& Ma, Y.P. Interaction and Social Issues in a Human-Centered Reactive Environment, in Proceedings of CAADRIA 2002, pp285-292, 2002.

Johnson, B. It's just the future. Advertising Age, 71(16), 8+. Retrieved January 16, 2001.

Keiichi, S., Youn-kyung, L. Physical Interaction and Multi-Aspect Representation for Information Intensive Environments. Proceedings of the 2000 IEEE International Workshop on Robot and Human Interactive Communication, pp.436-443, 2000.

Kristof, R. & Satran, A. Interactivity By Design. Mountain View, CA:Adobe Press. 1995

Runde, A. S., The Challenge of Internet explosion: ideas for staying ahead of the users.

Screven, C.G. Information design in informal settings: Museums and other public settings. In Information design, ed. Jacobson, R., 131-192. Cambridge, MA: MIT Press. 1999

Shu, yeong Fuh. Advertising, Lungteng Cultural Co., Ltd 1989

Skuba, C. Web site vs. web session. American Advertising, 12 (1), 22-23,1996.

Steuer, J. Defining virtual reality: Dimensions determining telepresence. Journal of Communication, 42(4), p73-93, 1992.

Sun Xiu Hui, Ping Jian San. Advertising Culture, Yang-Chih Book Co., Ltd. 1998

Vedrashko. MIT Advertising Lab . <http://adverlab.blogspot.com/>, 2008

campaign for real beauty. Dove . <http://www.campaignforrealbeauty.com/>, 2007