A study on the application of user experience to ICT-based advertising

Min-Wook Choi

1Department of Advertising & Public Relations, Namseoul University, Cheonan, Choongnam, 331-707, South Korea
mwchoi@nsu.ac.kr

Abstract

Background/Objectives: This study examines the application of user experience concept to ICT based advertising. Especially user experience related factors in advertising are analyzed.

Methods/Statistical analysis: This study mainly used literature review. Specifically, various academic research papers, practical reports, statistical data including market data, and consumer data were utilized. Based on these various literature studies, this study examined the concept and meaning of user experience in various field, and the feasibility of application to ICT based advertising.

Findings: In order to increase the effectiveness of ICT-based advertising, it is important for consumers to engage in active advertising activities and behaviors. However, it is not easy to induce consumer to participate and act actively, and thus encouraging consumer involvement is crucial to the success of ICT-based advertising. Therefore, user experience, which means interaction through participation and use in ICT-based advertising environment, where active participation and behavior of consumers is important. Therefore, the application of user experience is important in increasing the effectiveness of ICT-based advertising. Improved user experience can serve to lower barriers to obstruction between target users and ICT-based advertising.
It is directly related to marketing and communication effect. When consumer contacts ICT-based advertising, introducing new world with message and method which consumer understand and feel easily is effective way to minimize barriers to entry.

**Improvements/Applications:** There are few research which studied user experience as a main research topic. Through this study, it is expected that user experience related research are activated in advertising study.

**Key Words:** User experience, ICT-based advertising, Affordance, Flow, Interactivity

1 Introduction

Recently, new ICT such as IoT, artificial intelligence, virtual augmented reality, and location based services have been activated and major changes are taking place in various industrial and social fields. These changes are opening the fourth industrial revolution era. These changes are not exceptional in the field of advertising, and new ICT-based advertising is growing, such as IoT-based ads, beacons using location-based services, digital signage, and drones. Especially in the situation where the traditional advertising industry is in crisis due to changes in the media environment, ICT-based advertising can be a stepping stone for the development of the advertising industry.

User experience (UX) is a concept that should be noticed in relation to the advertising information processing of consumers and advertising effect in ICT-based advertising. User experience is a field originally developed by HCI (Human Computer Interaction) research that studies interfaces for efficient interaction between computers and humans. It is a study of the process of accumulating user experience that occurs when a user uses a product or service so that the user can access and accept information provided more easily and quickly.

In this context, this study examines the application of user experience concept, which has been mainly dealt with in HCI field, to ICT based advertising. Especially user experience related factors in advertising are analyzed. Through this study, we can expect the activation of research on user experience in ICT-based advertising.
research by looking at the application of user experience concept and user experience related variables to growing ICT-based advertising. In order for new advertising-related technologies and services to be accepted and spread in the fourth industrial revolution era, it is essential to provide rich user experiences in the process of using technology or services. However, to date, even though there have been cases in which researchers have used individual variables related to user experience in advertising research, there have been few researches in which user experience was used as main research topic. In this context, this study will examine the application of user experience concept, which has been mainly dealt with in HCI field, to ICT based advertising.

Through this study, it is expected that multi and interdisciplinary research will be activated in the field of advertising and public relations in the era of convergence. The user experience, which is the main concept covered in this study, has been studied mainly in artificial intelligence, design, and cognitive psychology, but it is not easy to find in advertising and public relations. Therefore, this study can contribute to the activation of multidisciplinary research in the field of advertising and public relations in the situation where new forms of advertising using ICT are growing rapidly. I expect that the user experience will gain more attention in advertising research in the ad technology era through this study.

2 User Experience

User experience (UX) is a concept that should be paid attention to in relation to advertising process or advertising effect of ICT based advertising. User Experience is a valuable experience that can be gained through interaction such as participation, use, and observation while using a product or service as a concept to maximize user's usability and convenience. Unger and Chandler defined user experience as "creating and combining elements that affect experience in a broad sense for the purpose of influencing user perceptions and behaviors associated with a particular company" [1]. The lexical meaning of the user experience is a combination of the existing HCI concept and all the experience and satisfaction that users feel when using a product or service. It is used in combination
with the user interface in terms of viewing from the perspective of
the user who uses it, not from the perspective of product provider.
However, if the user interface focuses on usability according to the
user’s needs, there is a difference that the user experience focuses
on what the user can feel through it. In other words, everything
that a user experiences to use something can be referred to as a
meaning of user experience[2].

In the past, companies have concentrated on the user interface.
However, unlike the user interface, which focuses only on the re-
lationship between the product itself and the consumer, the user
experience focus all consumer experience which they get during
consumption. For example, a user’s experience includes company
brand, image, function, service, and the whole area where the user
directly or indirectly feels and thinks about the product. User ex-
perience is a multidisciplinary field of study. And when collabo-
ration among product management team, engineering team, and
UX design team is made, the successful result of user experience is
accomplished.

The elements of this user experience can be defined and ap-
plied in various fields. In the HCI field, the research was conducted
mainly on usability[3]. The purpose of the usability study was
focused on performance and goal, efficient achievement, and cog-
nitive information processing. Usability and ease of use were the
main factors in the usability study. But with the development of
technology and changes in the social environment, approaches be-
yond this mechanical aspect are required. It is a noninstrumental
aspect of trying to understand the user’s experience, such as the
emotions that people experience in using a product or service with
an approach that considers other aspects of user interaction[4].

As an extension of this user experience, the user experience in
HCI (Human Computer Interface) can be divided into usefulness,
usability, and affect as seen in Table 1. Usefulness implies that
the process by which people use the system must be effective, and
usability implies that the process by which people use the system
must be efficient. Usefulness and ease of use can provide the best
experience for users when they are offered at the same time, and
affect refers to the feeling of a product, service, or system that is
in the user’s mind. Affect refers to the overall image that human
beings feel through the product including emotions or personality...
along with aesthetics. Affect is perceived as powerful elements that support usefulness and usability [5], which is recognized as an important element of the user experience.

Various studies are underway to apply user experience to various media platforms and services. Cross-platform contents prefer personal experiences, and SNS prefer emotional experience. Hirshman and Holbrook have proposed aesthetic criteria, symbolic meaning and hedonic response as a concept of consumption value based on user’s emotional experience[6]. Aesthetic criterion is a criterion for exterior beauty, and is an emotional criterion such as design, color, appearance, UI, UX.

### 3 New Media Advertising and User Experience

User Experience is a valuable experience that can be gained through interaction such as participation, use, and observation while using a product or service as a concept to maximize user’s usability and convenience. Recently, the concept of advertising is changing as ICT-based ads such as augmented reality ads, virtual reality ads, and location-based services are growing. It is changing from the traditional advertising that the consumer sees and listens passively to the new advertising that consumer acts actively. In order for new advertising-related technologies and services to be accepted and spread in new advertising environment, it is essential to provide a high-quality user experience. In other words, it is important for users to use technology and participate and enjoy it through participation rather than technology itself. In order to increase the effectiveness of advertising in ICT-based advertising, it is important for consumers to participate actively. However, it is not easy to

<table>
<thead>
<tr>
<th>Factor</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usefulness</td>
<td>The process by which people use the system is achieved effectively</td>
</tr>
<tr>
<td>Usability</td>
<td>It must be easy to use and efficient</td>
</tr>
<tr>
<td>Affect</td>
<td>Feel appropriate for the product or service, system that is in the user’s mind</td>
</tr>
</tbody>
</table>

Table 1: Factors of user experience on HCI
encourage active participation of consumers. Therefore, inducing consumer participation is very important for the success of ICT-based advertising.

The substantial reason why the user experience is important in the ICT-based advertising represented by ad technology is as follows. First, it is essential that the consumer is actively involved in the success of ICT-based advertising. In ICT-based advertising based on interaction, participation through user behavior is left to experience, which can be strongly appealed to consumers rather than traditional advertising. However, if these consumer behaviors are not done, the meaning and effect of advertising will be inferior. In other words, in ICT-based advertising environment where consumer’s active behavior is important rather than traditional advertising the user experience, which means interaction through participation and use, becomes important.

Second, as the sense and experience become more important in the process of using ICT-based advertising, the user experience point of view becomes important. Unlike traditional advertising, experience and immersion using ICT are important in ICT-based advertisement processing. This improvement in user experience can lower barriers between consumers and new technology advertisements. The user experience is designed to understand the user’s experience, such as the feelings and emotions that people experience in using a product or service, beyond the concept of a user interface that focuses on the physical aspects of the initial consumer’s use of a product or service. The importance of this noninstrumental aspect is why the user experience becomes important [4].

4 User Experience Related Variables in Advertising

4.1 Affordance

Affordance was introduced by the American cognitive psychologist Gibson and is often referred to as ‘action-inducing’, which means inducing certain behaviors [7]. In other words, it refers to the property of the object that induces the user’s action, and it refers to the force in which the form or image induces the action. Since then,
the concept of affordance has been extended to the point of view of human and computer interaction[8]. and has been applied in the field of cognitive psychology, industrial design, interaction design, and artificial intelligence. Affordance is considered important because the physical characteristics of a tool or service induce a user’s intuitive behavior when a user uses a tool or service. Affordance, which has the meaning of behavioral induction, is a view that interprets the human perception processor as an ecological approach. Norman, who has extended the concept of affordance to the point of view of human and computer interaction, applies the appropriateness of the manipulating methods of all objects in daily life[8]. He also looks at affordance from the perspective of helping users interact with things most effectively.

In 2003, Hartson proposed the application and model of affordance theory at the stage of Human-Computer Interaction (HCI) behavior based on human-centered design theory[9]. He suggests cognitive affordance, physical affordance, sensory affordance, and functional affordance as four affordance types based on Norman’s theory of affordance as seen in Table 2. Cognitive affordance is a characteristic that helps to think about or know about a tool or service. Physical affordance is a characteristic that helps physically act on a tool or service. Sensory affordance refers to a sensory design feature that uses senses related to the sense of sight, hearing, and tactile sense that a user has, and functional affordance is a characteristic that gives a purpose to such physical affordance.

<table>
<thead>
<tr>
<th>Affordance Type</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Affordance</td>
<td>Enable user to know</td>
<td>Button label which helps user notice what happen when he clicks a button.</td>
</tr>
<tr>
<td>Physical Affordance</td>
<td>Enable user to act in interface</td>
<td>Button design which is large enough for the user to click the button accurately.</td>
</tr>
<tr>
<td>Sensory Affordance</td>
<td>Enable user to feel</td>
<td>Large label text for easy reading.</td>
</tr>
<tr>
<td>Functional Affordance</td>
<td>Enable user to accomplish task</td>
<td>Internal system function design to sort a series of numbers.</td>
</tr>
</tbody>
</table>

Affordance, which is the strength of a thing or service that leads to the use of an object or service, is a concept that is related to the user experience that consumer experiences when contacting or using new technologies or new services. In the proliferation of services such as IoT, augmented reality, which is the core technology of the 4th Industrial Revolution, behavioral induction that natu-
rally induces user acceptance, use, and experience will become an important factor. Recently, in the success of Pokemon Go which has caused the hot wind, affordance which induced user participation and direct action in connection with reality is a major success factor.

Affordance stresses that it is important for humans, tools, and the environment to integrate with one another in ecological perspectives and to provide relevance to each other. The characteristics of these affordances are important as variables related to user experience in ICT-based advertising. This is because, in the case of ICT-based advertising, it is important to create a user experience that can feel the whole body through movement in the actual surroundings rather than focusing on the visual aspect centered on the fixed point of view. In this context, it is necessary to introduce the concept of affordance in order to understand the information processing process of ICT-based advertising which requires participation through active action of consumers and to increase advertising effect. In other words, it can be expected that affordance plays an important role for consumers who contact ICT-based advertising to do active action related to advertising.

Affordance refers to the attributes and qualities of things that enable a user to discover or naturally perceive interactivity with the environment or objects by inducing certain behaviors. ICT-based advertising provides realistic information through stereoscopic objects that support various senses such as visual, auditory, and tactile effects, resulting in positive effects through active participation and behavior of consumers. Therefore, it can be concluded that the affordance which the consumer experience when they contact and use ICT-based ad will have a positive advertising effect.

4.2 Flow

The concept of flow did not appear in the 1990s when the Internet became active, but has been studied by many scholars before. Csikszentmihalyi, who introduced the flow concept for the first time, defined the mental and physical excitement that people feel when they act in a fully immersed state [10]. The flow implies the concentration of the psychological state of the individual, that is, comfortable and natural state, which naturally flows into the work that he or she is doing. This natural flow state can induce inter-
nal motivation, Flow forms psychological state in which the current experience feels that it is an optimal experience. The immersive activity is an interesting thing in itself, and it sustains and promotes the activity. Positive emotions that can be obtained through immersive experiences are pleasure and happiness, which is an important driving force for developing the talents and abilities of users. Through this process of immersion, users will experience pleasure and self-fulfillment and gain various experiences[11].

Flow experience is different depending on how the balance of challenge and skill, which is the main factor of the flow, changes. When internet users have a high sense of challenge, but they are low in skill in the use of the Internet, they feel anxiety, and when the skill is high but feelings of challenge are low, they feel boredom. When both the challenge and skill are low, they become apathy. And when both the challenge and skill are high, flow state is experienced[12].

Hoffman & Novak defined the flow of experiences in the course of using the Internet as a reaction to continuously interacting with the computer, which is inherently pleasurable, accompanied by self-loss and self-empowerment [13]. Ghani, Supnick and Rooney point out that the flow is an important difference in comparing the features of computer-mediated communication and face-to-face communication[14]. Since then, Hoffman and Novak have shown that flow is an important variable in the basic conceptual model of marketing strategy in computer mediated environment, and related research has increased[13].

Flow is studied as an important variable in the Internet-based new media environment because the continuous use of the Internet is closely related to the flow experience. Flow is a process of internal synchronization that leads to the use of the Internet. The process of synchronization occurs when the use of the Internet is embraced as an appropriate stimulus, feels challenging, and has the ability to control it. Flows involve the integration of action and awareness, and the intensity of concentration is so high that they do not pay attention to anything else. This flow state is experienced when consumers are deeply involved in the search process on the Internet. Therefore, the flow refers to the psychological state experienced by consumers in the process of searching the Internet or searching for information.
While doing web search activities, online games, Internet chatting, it is interesting to see that flows can be found in the process of being immersed and enjoyable in the current act being performed. The online cyber environment can be exciting and challenging for many users, and related technologies are required to use the web or the Internet. Since the main factor of the flow generation in the flow model is the level of proficiency in the individual’s challenge and skill, flow is used as a useful concept in explaining the behavior of online users. Especially, if the flow state is not interrupted from the outside while using the website, quick feedback on the online and interaction between the machine and the human being has an effect of further improving the flow state.

The flow concept is important in Internet research because the flow experience in the Internet usage situation affects various Internet related behaviors. Flow has been mainly addressed as a variable that affects consumer behavior such as purchase intention, satisfaction, and loyalty of brand users in the Internet environment. In the case of ICT-based advertising, which is expected to induce persuasion through immersion with active participation of consumers in comparison with traditional advertising, the flow is related to the user experience and it is considered to have a positive effect on the advertising effect. So flow is expected to be an important user experience-related variable.

4.3 Interactivity
Interactivity is a key characteristic of new media and is a concept that is important in related research[15][16]. In a technical sense, interactivity refers to a state in which technical communication between a supplier and a user is possible as an upstream or downstream transmission becomes possible. Interaction in new media research is understood as media characteristics and user characteristics. Among the attributes of media, interactivity has been regarded as one of the main attributes of digital media and relatively rich research has been carried out. As interactivity is an attribute of newly emerging media, research focused primarily on its conceptual rules and classification of types. Since then, in the 2000s, specific researches have been carried out to clarify the concept of interactivity and to verify its effect mainly through experiments to
clarify the causal relationship.

If we look at the research on interactivity of new media that has been carried out so far, it is divided into two major divisions. Rice[17], Rogers[18], Williams, Rice and Rogers[19] are examples of research on the functions of media and communication that give interactivity. McMillan[20], Newhagen[21], and Wu[22] are examples of research on interactivity perceived by individual users participating in communication rather than functional interaction. This distinction can be attributed to the question of whether interactivity is viewed as an inherent attribute of technology or perceived interactivity. First, functional-based interactivity research sees the definition of interactivity as the ability of a communication system to deliver a message to a user, and thus how the media has the ability to respond to a user’s message. On the other hand, the reader-centered interactional study suggests that the content and level of experience of the individual about the media have greater explanatory power than the function of the media in identifying the communication process of interaction. However, some studies do not distinguish between media-oriented and perceived interactivity, or they are equivalent.

In some interactivity studies, researchers tried to identify the interactivity components by examining the sub dimensions of interactivity. These sub dimensions of interactivity are analyzed as seen in Table 3. First, two-way communication can be achieved as a minimum requirement for an interactive media. The second is related to the time of experiencing communication behaviors and can be referred to as responsiveness. This is a concept similar to synchronicity. In a new media environment based on interactivity, consumers can make quick choices and receive immediate feedback. The faster the reaction time, the more users will recognize that a particular media is interactive. A third interactivity component is control. Controllability refers to the degree to which individuals can choose the order of content, time, and communication, and interactivity increases as participants perceive the level of control in the communication environment. Fourth, playfulness means that the consumer can actively participate and enjoy. Particularly, participation focuses on the entertainment value of interactivity. Fifth, an interactive component is personalization, which means the degree to which information is tailored to suit the needs of individual
visitors.

Table 3: Sub dimensions of interactivity

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-way communication</td>
<td>The minimum required condition for an interactive media</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>The extent to which audience can make quick choices and receive immediate feedback</td>
</tr>
<tr>
<td>Control</td>
<td>The extent to which audience can choose content, time, and communication order</td>
</tr>
<tr>
<td>Playfulness</td>
<td>The extent to which audience can actively participate in and enjoy</td>
</tr>
<tr>
<td>Personalization</td>
<td>The extent to which information is tailored to meet the needs of individual audience</td>
</tr>
</tbody>
</table>

In terms of the communication effect, interactivity in the communication process enhances the process of the information processing of the receiver, thereby causing the user to actively participate in the communication process. In terms of advertising and marketing, interactivity increases the amount of information processing, thereby increasing the persuasive effect on the objects depicted in the content, thus affecting the formation of a favorable attitude toward the advertising message and brand [23]. Interactivity is a key characteristic of user experience, and it is expected to be an important concept in the processing of ICT-based advertising that requires active message processing and behavior of consumers.

5 Conclusion

In order to increase the effectiveness of advertising in ICT-based advertising, it is important for consumers to engage in active advertising activities and behaviors. However, it is not easy to induce consumer to participate and act actively, and thus encouraging consumer involvement is crucial to the success of ICT-based advertising. If ICT-based advertising based on interaction does not involve consumer participation and behavior, the meaning or effect as advertising may be deteriorated. However, if consumers participate and act, it becomes an impactful experience.

Therefore, user experience, which means interaction through participation and use in ICT-based advertising environment, where active participation and behavior of consumers is important, rather than traditional advertising that is viewed and heard passively, becomes important. Therefore, the application of user experience is
important in increasing the effectiveness of ICT-based advertising. Improved user experience can serve to lower barriers to obstruction between target users and ICT-based advertising. It is directly related to marketing and communication effect. When consumer contacts ICT-based advertising, introducing new world with message and method which consumer understand and feel easily is effective way to minimize barriers to entry.

In this context it is necessary to activate the research based on the user experience in ICT-based advertising research by grasping the influence of the user experience related variables including affordance in the ICT - based advertising. In order for new advertising-related technologies and services to be accepted and spread in reality in the fourth industrial revolution era, it is essential to provide high-quality user experiences in the process of using technology or services. There have been cases in which researchers have used individual variables related to user experience in advertising research. However, there are few research which studied user experience as a main research topic. Through this study, it is expected that user experience related research are activated in advertising study.

6 Acknowledgment

Funding for this paper was provided by Namseoul university.

References


