International Journal of Applied Engineering Research ISSN 0973-4562 Volume 12, Number 20 (2017) pp. 9931-9935
© Research India Publications. http://www.ripublication.com

# A Study on Understanding of UI and UX, and Understanding of Design According to User Interface Change

**Heonsik Joo***

**Division of Computer and Mechatronics Engineering, Sahmyook University, Hwarang –ro 815, Korea.*

**Corresponding author: Heonsik Joo, Ph.D.*

**Abstract**

As the Internet of things, mobile, and cloud computing technologies have evolved, interface technologies have evolved into CUI, GUI, and NUI, and another form of UI/UX is expected to be developed in the future. In this study, we showed understanding and production ability of the interface about internet, operating system, contents, and devices. This study aimed to make a list of 18 items in 4 areas for basic knowledge of UI/UX, establishment of design research, design concept, and design production for 29 sophomore, junior and senior students in IT departments, and the results of understanding were divided into three groups of excellent, normal, and insufficient, and evaluated. It was found that excellent was 19.35%, average was 42.53% and insufficient was 38.12%. Therefore, 20% of the students understood UI/UX, and 80% of students did not understand UI/UX well. In particular, in the comparison analysis of four areas, the design research area was 41 points, the design content area was 43 points, and the design production area was 16 points which was found to be the lowest. Next, the 10 evaluation items in the mobile UI/UX build guide evaluation were evaluated in the same way as the UI/UX understanding, and the excellent score was 16 points, the average score was 80 points, and the poor score was 194 points. The UI/UX build guides showed worse evaluation than UI/UX understanding. Therefore, to cultivate UI/UX understanding and content production ability, UI/UX experts should be fostered with professional course organization and systematic curriculum.

**Keywords**: User Interface Understanding, User Experience Understanding, Design Understanding, Mobile, UI/UX Trend, Design Trend

## INTRODUCTION

The ubiquitous concept was introduced in the 2000s and recently it has been developing into the age of Internet of everything. In the era of Web 1.0, the World Wild Web was a typical example of providing unilateral information. In the era of Web 2.0, information can be shared on a platform basis such as participation, sharing, and opening, and contents can be created by individuals. The Web 3.0 era is a personalized, intelligent web that deduces web pages from the individual's center to intelligent Web intelligence [1]. The web consists of various contents on a web page and interacts with various devices to process and utilize information. At this point, the role of interacting interfaces is very important. However, it tends to be overlooked easily. Therefore, this study attempts to explore UI/UX related technologies such as contents, devices, programs, HCI (Human Computer Interface), and content design (Design) in terms of design aspect and content production aspect [2, 3]. Therefore, to understand the UI/UX and content production ability, this study surveys computer related department students' measurement of the degree of comprehension and analyzes the results.

## CHANGES IN UI/UX TREND

### User Interface Changes

A user interface (UI) refers to a system and a user interacting with each other through commands or techniques to operate the system, input data, and use the contents. User interfaces range from systems such as computers, mobile devices, games, etc. to application programs and content usage [4]. User Experience (UX) refers to the overall experience related to the perception (emotion and thought), reaction, and behavior that a user feels and thinks through his or her direct or indirect use of a system, product, content, or service [5]. UX is a HCI-related concept that is widely applied not only in software and hardware development, but also in services, products, processes, society and culture. UI/UX is an interface through which a person can interact with a system or application in a computer and communication environment, which is classified into a software interface and a hardware interface [6]. The hardware interface is classified into a plug or an interface card connecting the computer and the peripheral devices, and the software interface is represented by the user interface [7]. The early interface was a Character User Interface (CUI) using characters. Subsequent interfaces were graphical user interface (GUI), such as icons and menus. With the rapid development of IT technology, interface was

developed to be NUI (Natural User Interface) such as voice, motion, gesture, and biological signal recognition to understand human intention more intelligently and humanly [8]. UIs suitable for the situation are continuously being studied in various fields such as mobile, hologram, location-based service, argument reality, game machine, and automobile, etc.

**Changes in UI/UX Trend Design Elements**

Interfaces are closely related to design and interaction. Interface design plays a role in visually linking system functions. The UX interface is also affected by the usability of the system, contents, and services, the user's affinity, and the user's value. This study describes the latest UI/UX [9].

**1) Evolution of Minimal Design**

In 2017 as well, designs that continue to use minimalist layouts while minimizing complexity appear. Minimalist design focuses attention on user contents first rather than UI, and provides an interface through clear visual communication [10].

**2) Increase in Micro Interaction**

Micro interaction was discussed on the Internet in 2016, and the trend is expected to continue in 2017. Micro interaction implemented in the form of a generally delicate animation plays a key role in UX design, and especially each time an app is used by a customer, thousands of micro-interactions will increase the role of mobile devices.

**3) Moving Pictures Become Popular**

Vision is known as the most powerful sensation of all human senses. The image was a major factor in the long user interface design, and the success with the image was a natural springboard to gradually develop into moving pictures. The image represents one thousand words and the moving picture represents ten times more words. There's a good reason for this, and the image is static while the moving picture is dynamic.

**4) Rich color and sensuous typography**

Rich color tone and color are used as user interfaces. It is also expected to be brighter by using bright colors as an interface. Thus, the UI is typographically represented using sharper color palettes, duotones, and bold gradient colors.

**5) Long scrolling and parallax technique websites**

Long scrolling or infinite scrolling is also expected as a standard for websites. In addition, mobile devices use the more scrolls on small screens linked with touch control types.

**3. Changes in UI/UX Design Feature**

By segmenting by layer from the strategy of determining the user's purpose with the UX interface to cognitive and sensory attributes that cause user behavior to the surface, Jesse James Garrett showed the framework of UX by dividing it into Strategy, Scope, Structure, Skeleton, and Surface. Recently, the design interface for UI/UX first of all gives priority to needs [11, 12]. If you show some action plan, it empathizes first. This is to understand the users. The second is to define the goal as a project or business by defining the problem. The next step, Ideate is to find ideas and solutions. The next step is to create a UI/UX that is presented as an idea or solution in the previous step as a prototype step [13, 14]. The next step is to finalize UI/UX by reviewing and making decisions as a final step. This execution plan is shown in Figure 1 as UI/UX interface Thinking.

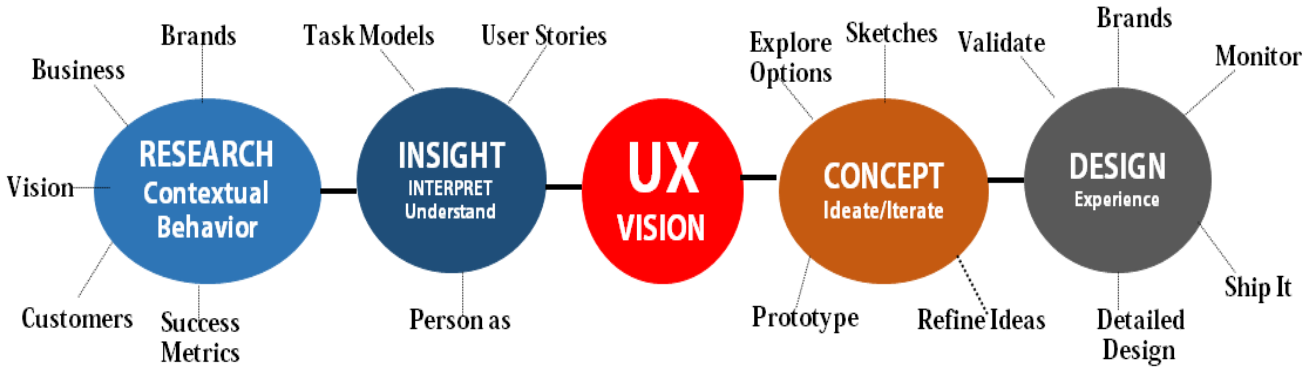


**Figure 1.** UI/UX Design Interface Thinking

**4. UI/UX Understanding and Analysis**

UX's four key axes are Needs, Expectations, Attributes, and Capabilities. Therefore, it recognizes problems with user needs, applies motivation and expectation of users with expectation, and has society, culture, environment, faith and information with user attributes. Capability refers to the limited service, immersion, and time and space margin of a particular user in a particular environment. In this chapter, a questionnaire list is created for the UI/UX interface for the IT department, and the self-diagnosis checklist is presented in response to the questionnaire. This study analyzes the evaluation results in various aspects to understand UI/UX and ability to make. Table 1 below lists the self-diagnosis of the UI/UX evaluation items. First, this study divides the area into 4 areas, and the questionnaire was created by sub-question list according to the area. The evaluation results are classified into excellent, normal, and insufficient by three fitness measures, and the evaluation criterion is set by 1 point each and the evaluation ability of 18 questions is evaluated by area. The evaluation is limited to 29 people and evaluated and analyzed.

**Table 1.** UI/UX Understanding Evaluation Items and Self-diagnosis

| No. | Area (Capability unit element) | Diagnosis items | self-diagnosis (29 persons) | | | |
|---|---|---|---|---|---|---|
| | | | excellent 1point | normal 1point | insufficient 1point | Sum |
| 1 | Basic knowledge | UI/UX Understanding | 1 | 20 | 8 | 29 |
| 2 | Establish design research | Understanding contents | 2 | 21 | 6 | 29 |
| 3 | | Qualitative/quantitative understanding | 0 | 12 | 17 | 29 |
| 4 | | Simple survey experience | 5 | 13 | 11 | 29 |
| 5 | | Information retrieval and data import available | 13 | 16 | 0 | 29 |
| 6 | | Understand smart device trends | 15 | 10 | 4 | 29 |
| 7 | | Ability to create images or graphic visualizations | 6 | 8 | 15 | 29 |
| 8 | Establish design concept | Understanding the concept target words | 10 | 10 | 9 | 29 |
| 9 | | Understanding smart device trends | 11 | 14 | 4 | 29 |
| 10 | | Ability to identify characteristics and content of similar contents | 3 | 16 | 10 | 29 |
| 11 | | Storytelling possible | 3 | 7 | 19 | 29 |
| 12 | | Hangul and power pointer available | 16 | 12 | 1 | 29 |
| 13 | Build design | Understanding mobile UI and UX terminology | 5 | 15 | 9 | 29 |
| 14 | | Photoshop available | 2 | 11 | 16 | 29 |
| 15 | | Illustrator available | 0 | 4 | 25 | 29 |
| 16 | | Understanding resolution | 4 | 12 | 13 | 29 |
| 17 | | Understanding typographic graphics | 2 | 5 | 22 | 29 |
| 18 | | Understanding brightness, contrast, and color | 3 | 16 | 10 | 29 |
| Sum | | | 101 | 222 | 199 | 522 |

As a result of evaluating the list of 18 items in 4 domains, the excellent score is 101 points, the normal is 222 points, and the insufficient is 199 points. The total scores were 522, and when converted to 100%, the scores were 19.35% for excellent, 42.53% for normal and 38.12% for insufficient, respectively. Therefore, it is said that more or less of 20% of the students have excellent understanding of UI/UX, and 80% of students do not understand UI/UX well. In particular, in the comparison of four areas, the design research area was 41 points, the design content area was 43 points, and the design area was 16 points, which was the lowest.

The following is the mobile UI/UX build guide questionnaire as shown in Table 2. On the subjects of 29 persons, each of the 10 evaluation items was evaluated as excellent, normal, and insufficient, and each item is estimated as 1 point and evaluated. It was found that the excellent score was 16 points, the average score was 80 points, and that the insufficient score was 194 points.

To show the score of each evaluation area with a total score of 290 points, there were 5.52 points for the excellent score, 27.59 points for the normal score, and 66.90 points for the insufficient score. Therefore, understanding of mobile UI/UX content build was only 6%.

Therefore, only 30% understand the build guide normally, and 67% do not understand UI/UX production well. Thus it indicates that mobile UI/UX build is less comprehensive than other areas. Therefore, in the future, it is indicated that more thorough step-by-step learning is needed in parallel with the theory and practice about the practical skills corresponding to mobile UI/UX build guide. This study reviews the evaluation results of Table 1 and Table 2. The self-evaluation of this survey was conducted in April, 2017. The 29 subjects, including 5 seniors, 3 juniors, and 21 sophomores were evaluated and no significant differences in grade were widely recognized. In the evaluation results of Table 1, it is only 5 items that showed more than 10 persons in 18 evaluation items in excellent understanding for 4 areas such as understanding of UI/UX, design research establishment area, design content establishment area, and design building area.

**Table 2.** Mobile UI/UX Build Guide Evaluation Items and Self-diagnosis

| No. | Area (Capability unit element) | Evaluation items | Self-diagnosis (29 persons) | | | |
|---|---|---|---|---|---|---|
| | | | Excellent (1 point) | Normal (1 point) | Insufficient (1 point) | Sum |
| 1 | Mobile UI/UX build guide | Understanding resolution and units | 4 | 11 | 14 | 29 |
| 2 | | Understanding Android and iOS Resolution Differences | 1 | 11 | 17 | 29 |
| 3 | | Understanding the iOS UI build guide | 4 | 4 | 21 | 29 |
| 4 | | Understanding the Android UI build guide | 0 | 10 | 19 | 29 |
| 5 | | Understanding the OS-specific build elements | 2 | 10 | 17 | 29 |
| 6 | | Apply color guide for each OS | 0 | 8 | 21 | 29 |
| 7 | | Ability to select typographic graphics to suit information personality | 2 | 7 | 20 | 29 |
| 8 | | Understanding OS-specific Layouts | 0 | 9 | 20 | 29 |
| 9 | | Understanding mobile UI/UX design terminology | 1 | 6 | 22 | 29 |
| 10 | | Understanding mobile UI/UX design patterns and terminology | 2 | 4 | 23 | 29 |
| Sum | | | 16 | 80 | 194 | 290 |

## CONCLUSION

Especially, those who were evaluated excellent were much lower in terms of professional list items related to UI/UX understanding. Table 2 shows the evaluation results for the mobile UI/UX build guide. In the 10 evaluation items, the 4 point item is the best evaluation item in the score of excellent evaluation, and in the UI/UX build, it is 6 times lower than that of Table 1 in the excellent item evaluation, and the distribution represented by normal and insufficient were too large. Therefore, it can be said that it is possible to cultivate competent IT professionals who have theoretical and practical skills if intensive major subject education is provided for them, and it is necessary to reinforce computer, graphics and design.

## REFERENCES

[1] Si-Jung Kim, Do-Eun Cho., Technology Trends for UX/UI of Smart Contents. The Korea Contents Association Review, 14(2016), 29-33.

[2] Sohyun Kim, Hyunnam Ha., Study on UX Satisfaction Index According to Types of Mobile Commerce Services, Journal of the HCI Society of Korea, 9(2014), 53-59.

[3] Jeong, Hoon Gu, Pan, Young Hwan., A Study on Optimal Interface of Mobile contents - Focusing on Card-type UI of SNS, Journal of Digital Design, 15(2015), 177-186.

[4] Joo heon-sik., A Study on the Mobile Game User Characteristic and Mobile Game Oriented, The Korea Contents Society, 5(2015), 389-390.

[5] Si-Jung Kim, Do-Eun Cho., Technology Trends for UX/UI of Smart Contents, The Korea Contents Association Review, 14(2016), 29-33.

[6] Kim, Sewoong., A Study on the UX/UI of Smart Mobile Remote Control App in the Development Trend of NUI, Journal of Korea Design Knowledge, 29(2014), 83-92.

[7] In Kyun Oh, Dan Bee Lee., A Study on Consumer Response on Retro Style in a Smart Phone Application UI/UX Design, Journal Of The Korean Society Design CulturE, 19(2013), 427-436.

[8] Won-Sung Sohn, Soon-Bum Lim, Sungho Woo., Curriculum development of UX based UI design for software, KOREA INFORMATION SCIENCE SOCIETY, 39(2012), 200-201.

[9] Changsik Moon, Yongsuk Choi., Web UI/UX Design for Content Recommendation, Korea Information Science Society, 6(2014), 933-935.

[10] Doo, Kyungil., The Study on the Value-Engineering UX/UI Design Evaluation Model Based on the User's Attitude, Journal of Korea Design Knowledge, 21(2012), 1-10.

[11] Doo, Kyungil., Study on Optimized UX/UI Design System through Use Value Analysis on App Book, Journal of Korea Design Knowledge, 31(2014), 365-374.

[12] Lee, Hyang Eun., A Study on the concept and types of UX design in the smart product field, Journal of Korea Design Knowledge, 30(2014), 289-299.

[13] Koo, Yoo Ri., An Investigation into User Experience (UX) Design Approach in Consideration of the Tenets of Design for Sustainability, Journal Of The Korean Society Design Culture, 21(2015), 33-47.

[14] Lee, Hyun Jhin., The Concept of Learning UX Design and its Design Methodology, KSDS Conference Proceeding , 5(2013), 68-69.