

Information Perception over Smart-phone Screen Transitions Styles

Sang-Hak Kim¹, Young-Ju Lee²,

¹ Namseoul University, Dept. of Information Design, 91, Daehak-ro, Seonghwan-eup,
Seonghwan -gu, Cheonan-city, Choongnam, South Korea

² Chungwoon University, Dept. of Multimedia Science, 113, Sukgol-ro, Nam-gu, Incheon,
South Korea, yjlee@chungwoon.ac.kr

Abstract. This study aims to clarify the relation between the information hierarchy and screen transition as a feedback element for user experience in terms of user sensitivity and presence in a user-centered design environment of smart-phone visual perception based on theoretical researches. The result shows that the information hierarchy includes transitions from top to bottom, return, and transitions in the same hierarchical structure. As for tasks depending on the information hierarchy and transition styles, most tasks are sequential movement for depth entry, movement from top to bottom, and return to the previous screen.

Keywords: smart-phone, information perception, screen transition

1 Introduction

Recently, a lot of efforts have been put forth into maximizing user sensitivity and presence in the area of smart-phone GUIs and UXs. Users desire intuitive interactions that go beyond existing interfaces. In particular, the advancement of multimedia technology and various contents require of users more efficient and intuitive interactions. Display types of smart-phones such as touch-screen make possible signal transference and manipulation on the screen through certain physical objects such as fingers or touch pens on graphical elements.

Upon touching certain information in a smart-phone, screen transition provides a feedback based on sensitivity, which is a subjective element, but the understanding and use of interfaces is determined exclusively by the user. Feedback elements preferred by users may be varied depending on the events that are used, and perception errors may occur due to the difference from a user's expectation depending on the situations[1]. Hence, this study classifies the types of screen transition and examines effective applications of screen transition based on the patterns in order for efficient information structure design and visual perception in the use of smart-phones.

2 Movement, Memory and Perception

Movement causes a visual stimulation that leads a user's gaze from one position to another consecutively. Visual stimulation does not continually follow the movement but keeps the gaze at a certain position for a relatively short time, which is called 'fixation.' At the moment of fixation, the user pays attention to the object, processing information in a way of visual and cognitive thinking[2].

Human memory is divided to three steps: sensuous memory, short-term memory, and long-term memory. These three steps are viewed as an information-processing model or a macro model in the area of cognitive psychology. Among these, it is short-term memory that plays the most important role in the design of an interface because the structure of knowledge stored in long-term memory consistently changes and new relations between encoded data inputs and existing knowledge continue to be formed. Short-term memory is determined by encoding in long-term memory. Perception of movements in smart-phone screen transition is in relation to the principle of grouping in Gestalt's perspective: Gestalt psychology, which was founded in the 1920s, claims that psychological phenomena are not divided to one dimensional perceptual elements but should be viewed as a whole that is systematized and structuralized[3].

According to Seow (2008), Feelings of a user about the system reaction rates is not only affected by the response time but also relative depending on the type of interaction[4]. It may be also subjective depending on users. It is highly probable that existing guidelines fail to reflect the high expectancy of response time of users familiar with smart-phones, and thus there is no standard for various types of touch-screen manipulation and appropriate changes or reactions as they focus on physical button manipulations.

3 Screen Transition and Information

As interfaces have changed from text-based to graphic-based, the use of transition is increasing in interfaces as well. Particularly, graphic user interfaces in screen display take into consideration both distinction and consistency between information factors in utilizing screen transition effects. Interface objects are user-oriented and subject to direct interactions with users. Transition effects help users more readily understand the information structure of an interface and thus result in a higher level of satisfaction with sensuous aspects. In the context of interfaces, 'transition' means to move from one information page over to another, which is essential for contents of digital devices. Especially for small screen interfaces such as those of mobile gadgets, transition effects play a vital role in the information system.

Applying transition effects to user interfaces is advantageous mainly in two aspects: First, it is possible to recognize the relation before and after transition. In a sequential progress of an animation, for example, a transition effect makes a cognitive distinction between the current scene and the following one, and the reason of using it is intuitively recognized. In addition, such transition effects in terms of sequence can attract more visual attention in an interface. Second, continuous motions produce a feeling of realistic movement[5]. Screen transition effects can be divided to various

types. However, since visual formations are indefinite and highly movable, it is difficult to divide transition effects to types. Standards for attribute analysis in this study are based on the animation principles of Thomas and Johnston[6] and dynamics principles of motion graphics. Based on 3D coordinate perception and touch interface characteristics, spatiality and directional attributes

One of the UI elements utilized when a user requires screen transition in an interface is navigation. Navigation is divided to the current position, destination, and return to the original position. Clues for this division include visual clues, locational/directional clues, moving route clues, and manipulation clues[7]. Interface structures are divided into 6: sequential structure, grid structure, hierarchical structure, net structure, combined structure, and variable structure. The UI basic menu structure utilized for most smart-phone operation systems is of the sequential structure combined with the hierarchical lineal structure.

Major transition tasks from top to bottom among digital device operation systems include application execution, Windows execution, movement to lower level directories, etc. Transitions from bottom to top, or returns, include application closing and returning, discretionary exit, etc. The sequential structure has been a big issue as the use of multi-tasking is widely used.

4 Suggestion & Conclusion

This study aims to clarify the relation between the information hierarchy and screen transition as a feedback element for user experience in terms of user sensitivity and presence in a user-centered design environment of smart-phone visual perception based on theoretical researches. The result shows that the information hierarchy includes transitions from top to bottom, return, and transitions in the same hierarchical structure. Screen transitions are divided to the entry type - depth entry/exit such as application execution - and the progressive type for inter-depth transitions. The entry type according to transition styles includes Scale in/out, Flip in/out, and Refresh while the progressive type includes Move in/out, Push in/out, and Free styles.

References

1. J.H, Kim., Multimodal Feedback Usability Analysis on Touchscreen-Applied Mobile Device, Hongik University Graduate School Video, p77 (2009)
2. Yarbus, A. L., Eye Movements and Vision, L. A. Riggs, New York, Plenum Press. (1967)
3. S,J,Oh., Human behavior and psychology, HakjiSa, Page 71~94 (1999)
4. Seow, S. C., Designing and engineering time: the psychology of time perception in software . Boston: Addison Wesley Professional.(2008)
5. Raskin, Jef., Human Interface, Addison-Wesley, (2002)
6. Ollie Johnston, Frank Thomas, The Illusion of Life: Disney Animation, Disney Editions (1995)
7. Y,J,Soh., A Study on Screen Navigation Interface Design, Kukmin University Graduate School of Techno Design, (2007)