A Suggestion for Seamless Interaction on N-Screen Era

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Abstract. On this research suggested the elements of UX for seamless interaction for using contents under the cross platform environment in N-Screen era. Firstly, this research looked into the changes of contents and user under the N-Screen environment and then recognized the necessity of research about new UX elements. User experience, temporal and spatial visual search, cognitive load, gestalt psychology, inconsistent and metaphor will worked as major UX elements for making new contents for cross platform. These should be reciprocal relationship rather than independent.

Keywords: N-Screen, UX, Seamless, interaction

1   Introduction

The number of smart-phone users in the world increases in geometrical progression. The development of hardware and network, and the innovation of smart-phone have universalized multi tasking which allows users to use diverse services simultaneously. Accompanying with such changes, 3-screen emerged which allows users to connect contents or services with PC or TV without cut off. Internet connected devices including smart TV, car navigation, PMP, smart pad, digital signage and smart watch are diversified so that N-screen is becoming an issue with the cloud service.

The increase of connected devices and environmental evolution establish different mental models of users about interaction. It is obvious that the number of contents will increase. However, the interaction methods are different in each device although it is the same content so that optimization is needed.

Interaction between screen devices is important for user activities in cross platform. Screen interaction means to make new values through reciprocal reactions between devices beyond the same contents, the same services, the same function, and the same UX access to diverse devices. Under such environment, seamless is still an important keyword. We should pay attention that cut off occur in the user experiences with the move of user's gaze between device screen partition, and change of UI while focusing on seamless use of contents or services. Namely, we should pay attention to psychological and cognitive seamless in the user experience as well as technical part.

2 The changes of media contents and users under N-Screen era

The technology of using contents simultaneously in diverse areas such as contents, platform, network, or devices is being developed. Each technical elements is being combined as the concept of N-screen. N-screen service is media contents oriented and it may be seen as natural evolution from existing story oriented service. The media contents for N-Screen are supplied as simple streaming from optimal format of contents for each screen. It may not be played through connection with a different device but recently, the environment to use contents in more diverse methods has started to establish based on the mobile environment.

Jeon Beom-ju and Park Ju-yeon said the possibility to access into contents is increasing through tablet PC, DMB, game machine, and navigation including TV, PC, and mobile devices. They talked about diversification of interface accessing into contents such as generalization of multiple services including IPTV, DMB, satellite and mobile [1].

Besides, simultaneous use of different services is increasing. According to the survey by MBrainTrendMonitor which is a market research institution, 91% of the respondents said they have used another digital device while watching TV [2].

3 Discussion Factors

N-Screen Age changes in the content and user experience, and accordingly requires a new UX research. Therefore, this research can suggest the following elements..

3.1 User experience

The process of establishing experience is not simple. Jesse McMullin said an experience is not formed at once but through meaningful links of expectation, proximity, recognition, connection, action, responses, and assessment through a certain situational opportunity [3]. The interaction oriented user experience element focuses on interaction between people and products in the situation. In other words, internalized mental function becomes an important element of decision in the image thinking and the past experiences revitalizes structuralized schema and they are processed through information in the schema. Therefore, it is important to keep consistent experiences for interaction through human's natural recognition ability.

3.2 Temporal and spatial visual search

Saccade, eye fixation and eye movement for return sweep accompany in order to acquire information on something [4]. Treisman and Gelade found out that selective attention mechanism is necessary in the process of visual information through visual search of a certain target among many objects in the complex visual scene [5].

The attention and interaction in the process of visual search makes more effective visual search because it guides spatial attention based on the memory of explored stimulus. This is also seen in contextual cueing effect which facilitates search for the same stimulus after a tactic memory for search stimulus. Active and dynamic visual search of N-Screen requires more process of information than static visual search. Therefore in order to avoid user's psychological, perceptual, cognitive load the new UX research is needed

3.3   Cognitive load

The dispersed suggestion of information in multimedia contents pre-requisites internal referral connection which should combine information through mind. This leads to cognitive load that makes the user hard to concentrate on cognitive resource [6]. Moreover, Jeheon Rue asserted that the allocation of screen and screen partition affect perception of task difficulty degree. He said existing knowledge and cognitive load have close relationship [7].

In order to reduce cognitive load in cross platform, the UI which considers user's age and sex and properties of the user group should be provided. Serial provision of information structured as proper unit may be another method for easy cognitive process.

3.4   Gestalt psychology

Gestalt psychologists suggested that a form is the original unit of perception. The results of judgment under human's visual perception may be interpreted through diverse methods but the interpretation shows diverse responses by individual. Gestalt psychology shows simplicity, regularity, symmetry, and convenience of memory. It also has many grouping rules recognized as a form with proximity, similarity, closure, continuity, common fate and prägnanz. In the cross platform environment, it is helpful to make use of such laws to keep visual and perceptual consistence.

3.5   Consistency and metaphor

Consistency means similar users lead similar result. It affects perception of properties such as platform range, level of comparing interaction, namely if it is visual expression or task, and consistency during the user or on the move. Therefore, keeping consistency between devices means coherence of providing a series of experience through mutual cooperation in implementing independent task rather than uniformed consistency. It is necessary to provide homogeneous UX through local optimization suits with the characteristic of device.

Metaphor is the process of connecting strange concept or meaning to understand a target domain using the concept of familiar and known source domain. In the cross platform service environment, the good utility of metaphor for seamless interaction may increase use by reducing the gap between domains and keep uniqueness through differentiation from other products.

4   Recommendations

In this research, I suggested major UX elements for seamless interaction in the use of contents under N-Screen service. Firstly, I looked into the changes of contents and users under N-Screen environment. It is necessary that the design under cross platform environment accepts new UX elements.

User experience, temporal and spatial visual search, cognitive load, Gestalt psychology, consistency and metaphor are essential UX elements to create contents in such environment. The relationship between them can't be independent but should have mutual complement.

5   Conclusion

The cloud service, emergence of diverse connected devices, and the increasing number of users will increase demands for cross platform contents in N-Screen service environment. It seems obvious that the contents will be increased. In this era, we are putting a lot of efforts for seamless but we neglect the necessity to put more efforts into the users. Thus, the research for each issue mentioned above may become good research data to understand their influence to users and give directions for contents design for the users. Such researches will be used as basic data for many researches about interaction.

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