A Framework Proposal of UX Evaluation of the Contents Consistency on Multi Screens

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Abstract. In the study, we attempts to define coherent experience as those where user experience is maintained in a harmonious and coherent manner in a multi-screen environment, and identify the items that offer such experience. If user experiences are provided naturally and consistently without any sense of difference, irrespective of the change of devices when user utilize the contents, loyalty to the contents will be increased automatically. In this study, specific guidelines of each screen are produced, which should be observed to provide consistent user experiences.

Keywords: Multi screen · Consistency · UX evaluation

1 Research Background and Purpose

Technology development enabled users to access same content from the various devices, and along with this trends, cognitions or usage behaviors of the contents use have changed rapidly.

Users request the efficient user experience from their perspective, which is using same contents from various devices seamlessly and using them without any additional training. User experience indicates everything internalized while using the product or services, which are feeling, memory, and satisfaction including experience. In this study, user experiences from multiscreen environment, as described above, are named as coherent experience, and are defined as [coherence of holistic experiences from the task completion, in spite of the variation of user interfaces provided by each screen, when users access contents through the screen]. In order to provide such user environment, contents producers should design user interface of each screen with a set of rules which are all encompassing although physical environment of each screen, that is sizes or operation methods, are different. If user experiences are provided naturally and consistently without any sense of difference, irrespective of the change of devices when user utilize the contents, loyalty to the contents will be increased automatically. In this study, specific guidelines of each screen are produced, which should be observed to provide consistent user experiences (Fig. 1).

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Fig. 1. Service environment

2 Multiscreen Environment and User Experiences

Smart phone, Tablet, PC, and TV have developed from their independent area with different purpose. However environment which can access to the networks anywhere and at any time made previous independent function of each screen to be shared together. We can see or edit the photos which saved in smart phones, from TV or tablet. Recently, smart watch, another new screen, appeared and played various roles connecting to smart phones. Due to the different physical use environment, which is screen size or input-output method, same content is designed differently upon the screen.

Representative multiscreen use environment has been described in Table 1.

In the case of smart phone and tablet, which is the typical one person media, mobility function was strong, which can be used while moving, screen size was small, and direct operational methods, using fingers, were dominant. On the other hand, in the case of PC and TV, indirect operational methods were mainly applied, which use remote controls or mouse using in limited space. In the case of TV, the distance from

Table 1. Multiscreen use environment

	Mobile	Tablet PC	PC	TV
Screen size (inch)	3.5–4	7–9.7	17～	20–60
Distance (cm)	15	30	50	200
operate	Touch	Touch	Mouse, Keyboard	Remote
Main user	individual	individual	Official	Official
purpose of use	Call, Message	Call, Message, book	Job, els	Watching TV
where	Mobility	Mobility	Room	Room

users was most far, and the degree of freedom was low compared to other screens due to the environment of using remote controls.

According to Nishida Hiroko (2000), information entered through human sensory organ activates schema, which is the past knowledge response related to the information or organized experiences about past events, and then processed by the information in the schema. When users encounter a service, they utilize not only the previous related experiences, but also different kind of experiences. For example, when tablet appeared first, experiences from mobile, PC, or TV can be reminded and used. This can be interpreted as the relations with natural human cognitive ability. Users at multiscreen environment want various experiences. They are smooth connection, which is seamless contents technically, maintaining consistent task performance after switching to different screen from the previous screen with no inconveniences, and so on. As Nishida Hiroko's opinion, new information can be explained by substituting coherent experience, solving out naturally through the interpretation of the accumulation of previous experiences. While providing service of same contents on multiscreen, information amount, visual structure or shapes are not equal. This is reasonable considering physical differences among each screen. However the difference of screens which users are watching doesn't imply that contents are different or can't be used. Depending upon previous experiences of using same or similar contents from different devices, this can be used through the inference and judgment. Since such inference can be made easily on multiscreen, it is important for users to use contents from other screens without any unfamiliarity.

3 Coherent of User Experience Design

Interaction design area is expanding gradually from UI design (User Interface design) to UX design (User experience design). UI design is a touch point between people and systems or information channel between users and each system. UI design emphasizes cognitive aspects for user's convenient use. UX design is used in a broad sense implying integral user experiences of service or products including UX design. Many enterprises or researchers produce UX designs considering overall usage processes including UI design in order for users to feel valuable and meaningful experiences when they use products or service.

4 Selection of Analysis Items Measuring Coherent User Experience

Examination of the flow of user's experience of the product shows the order of cognition, access, use and disposal of the item. That is, users become to have certain experiences about the product through the whole process, from the cognition to the disposal of the product. In this study, analysis items of the measurement for these whole processes were selected to measure the coherent user experiences. This study used heuristic check list method, based on usability evaluation checklist by Jakob Nielson and evaluation checklist by Xerox, suggested analysis factors for the users experience comprehensively

Table 2. Analysis items selected from the interview

Category	Sub-Category	Coherent experience for multiscreen
Goal	Objective	Provide similar functions for each screen, and specialize it reflecting their characteristics.
	Seamlessness	Specified settings from one screen should be applied together.
Interaction method	Input method	Proper method for the characteristics of screens is available.
	Interaction rules	Although screens are different, moving direction of interface or regulations should be produced equally.
Graphic user interface	Layout	Appropriate method is available based on the characteristics of screen.
	Color	This needs to be identical or similar.
	Icon	This needs to be identical or similar.
	Font	This needs to be identical or similar.
Information architecture	Access	Appropriate method is available based on the characteristics of screen.
	Customization	This doesn't need to be provided depends on the characteristics of screens.
	Navigation	Appropriate method is available based on the characteristics of screen.
Sound user interface	Feedback	Maintaining basic consistency of each screen, and considering the usage environment (use at public space or individual use).

and formed expert group who derived appropriate elements. With the theme of 'Elements Selection for the Coherent Experience Analysis on Multiscreen Environment', focus group interview was conducted, and a discussion about maintaining the consistency with differences of the physical environment of each screen and assigning the degree of freedom was held.

Analysis items selected from the interview were summarized in Table 2.

Analysis items were classified into two large groups, which were invisible items and visible items. Invisible items imply abstract UX Goal. These items indicate the processes of users, who use the screens with a series of purpose, from downloading contents to accomplishment of the goal with contents. On the other hand, visible items are items about a touch point of interface, which is encountered when users operate contents directly from each screen, or interaction regulations which can be felt while usage.

5 Conclusions

In this study, significant user experience, which is occurred while using same contents on multiscreen, was defined as Coherent Experience, and Focus Group Interview was conducted to investigate which elements provide the coherent user experiences. For the

sake of harmonized and consistent experience on multiscreen, items to meet the requirements for all screens and optional items depend on the screen environments or conditions were differentiated. User's purpose from invisible items provide similar functions, but needs to be specialized considering screen's characteristics, environments, and users' features. As for the connectivity, settings specified by one screen should be applied equally to other screens. This should be observed in contents design, and the degree of freedom of this item is low. Interaction regulations of visible items, which are direction of interface movement or regulations of operating functions from all screens, need to follow the principles, it is desirable to consider additional services of application elements, which can increase diversity effect of age or occupations. For the graphic layout, the degree of freedom of each screen is relatively high. Rather than the identity which unifies the design of all devices, providing several elements, such as point color or symbol fonts, similarly will enhance users' coherent experience in spite of different designs. As a result of YouTube analysis, information structure was a most dissimilar item by each screen. It was verified that the degree of freedom was high for designers or producers when creating the contents. In the case of sound, from the YouTube contents, independent sound feedback was not supplied by each screen. However if this service is offered, maintaining the basic consistency of each screen and considering the usage environment, public use or individual use, will make users' experience more positively. In this study, analysis items were extracted from the result of focus group interview. Therefore verification applied to the real contents has not been made. From further study, analysis item will be applied to the contents in current service, and validity verification will be made.

References

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