

Touch based interaction using a three display interface design

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ABSTRACT

In this poster we present findings of a study focusing on touch based interaction using a three display interface design on a mobile phone. We aimed to reveal users' individual preferences and methods for mobile device personalization; to find out to which extent users have already adopted the method of touch based interaction; and finally to investigate users' acceptance of location-based idle screens. Using our new interaction concept for a mobile device, we found out that participants perceive the possibility to personalize their mobile phones as important due to emotional bonding reasons with their mobile device and still the method of touch based interaction has not been fully adopted.

Categories and Subject Descriptors

H.5.2 [Information Interfaces and Presentation]: User Interfaces – *Interaction Styles*

General Terms

Human factors.

Keywords

Touch display interaction, personalization, location based idle screen

1. INTRODUCTION

Mobile consumer technology is more and more incorporating touch displays especially in mobile phones. Touch based interaction received in general positive feedback from users and has helped to improve the user experience when interacting with these kinds of devices. Following this train of thought we were interested in questioning to which extent users of such devices have really adopted this way of interaction e.g. when personalizing the interface. Accordingly we developed a new interaction concept by splitting one large display in multiple smaller displays due to our hypothesis of this having a grave effect on participants' perception of the mobile phone as well as on their interaction with it (Figure 1). This approach inspired us further to develop a new design concept for location-based idle screens. We conducted a study with the aim to investigate users' interaction experience, their attention focus and preferences for the interaction with multiple touch displays.

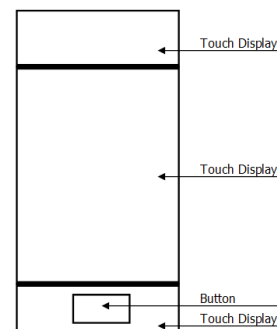


Figure 1: Paper Prototype Model of the three touch displays.

2. RELATED WORK

Device personalization can occur in functional and non-functional forms. Non-functional forms of device personalization mean the adding of elements to the device to fit better to lifestyle and self-identity based on its role as an element in fashion [2], whereas functional personalization means the creation of e.g. soft key shortcuts and menu item reorganization. Gesture input on mobile phones and gestural interaction techniques have disclosed a challenging field of research especially the realm of user experience through the use of gestures [1]. Research in this realm focused on being able to detect the specific context of the user and offer matching services. Especially interesting for our research approach were studies about adapting applications to match the user's context and were explored by [3]. The research topic of location-based idle screens and mobile presence highlights on the one hand the convenient and time efficient method of communication and the localization of friends [4], but on the other hand the discussion about the side effects like the feeling of being watched needs to be pressed ahead within the HCI community.

3. THE STUDY

An experimental setup was defined to access users' ability and preference for interacting with a segmentation of three touch displays. 12 mobile phone owners took part in individual sessions of around 90 minutes to discuss these. Participants were selected to be part of a specific target group of users aged 21 – 39y (balanced gender, average age 27,8 years) and had to meet the criteria of frequent Internet use on the mobile phone, touch display interaction experience, and frequent use of mobile multi-media content. Participants received monetary compensation for their time.

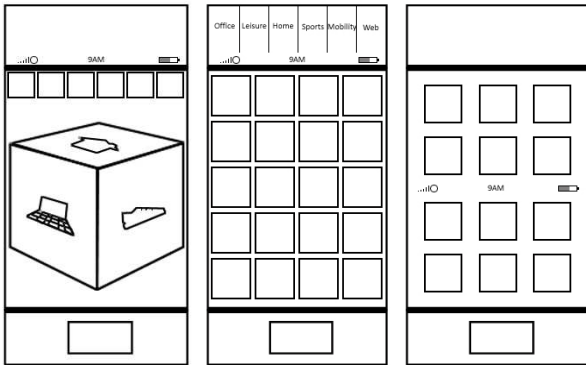


Figure 2: First, second and third user interface prototype

3.1 Personalization

In the first part of the study we conducted semi-structured interviews with each participant to gain knowledge about general attitudes towards and practices of mobile phone personalization. We were especially interested whether the segmentation of a display and new possibilities to arrange content/applications on a mobile phone interface, through offering the participants the possibility to choose their preferred areas for content on our three touch displays, would have any effect on users' personalization behavior.

After each of the participants had defined a personal preference where they imagined the categories would be placed best, all participants were asked to complete a card sorting task involving 24 cards containing menu options, as well as names of mobile phone applications. The criteria for the classification could be chosen by the participants, e.g. frequency of use, preference, etc.

3.2 Idle Screen Design

We designed three prototypes of our location based idle screen concepts in order to offer participants the possibility to compare the different interaction techniques. The interface design criteria for the three prototypes aimed to achieve a good visualization of our overall study goal (Figure 2). The first prototype was designed to represent the location based idle screen through a dynamic, three dimensional interaction element – a cube.

The second interface prototype was designed to visualize in the top display the location based idle screen context menu. The third and final prototype was designed to offer the participants a simple and convenient interface solution. In order to reveal to which extent users have already adopted the method of touch based interaction each participant of the study had to fulfill eight tasks on each of the interface prototypes.

3.3 Location-Based Idle Screen and Mobile Presence

Based on our developed design concepts for location-based idle screens as described before, we used especially our second interface prototype (Figure 2) to approach our research interest on the acceptance for location-based idle screens on a mobile device. The interface characteristics therefore were to present different contents, clustered in location/activity menus and were presented in the top screen of the device.

The goal of this approach was to investigate users' acceptance of a location-based idle screens where the users' location is identified and as a result the idle screen matches the location/activity the user is currently active in. Further we highlighted our pre-defined content for each location/activity and visualized this through colors in the upper display.

4. CONCLUSION

Our study revealed that touch-and-gesture interaction on a touch display is not as familiar to users as might be expected. Participants were initially amazed to be confronted with three touch displays and could at first not see much sense in this segmentation. During the post interviews participants stated that it could turn out quite useful when there is a clear and transparent segmentation of content in each display. Further we were able to conclude that there are mainly emotional reasons for device personalization, like having a good feeling through this or being offered the possibilities of self-representation on a mass consumer object. However, we observed not only unfamiliarity with the interaction as such but also with location-based idle screens. When being on the move or abroad participants imagined it to be useful but rejected this service for everyday use due to privacy reasons. For future research we aim to get a more detailed feedback to individual elements of potential user acceptance/adoption and expect that a combination with value-based approaches might provide further user acceptance ties to improve the interface design further.

5. ACKNOWLEDGMENTS

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