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# An HCI approach to represent tiles as people on Windows Mobile

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## **Abstract**

Windows mobile is strongly emerging as a mobile operating system that is to compete with the dominant operating systems such as Apple and Android. What makes Windows mobile so distinctive is its unique tile interface. It is this tile interface that could make or break Windows mobile; however there are areas of this unique interface that are yet to be explored. Design plays an important role when creating new mobile systems. This paper takes an HCI approach, looking at Windows mobile tiles and using them to represent people by looking at design principles and limitations of current mobile device interfaces.

## **1. Introduction**

The study of off-desktop human computer interaction has become very popular over the past decade due to the rapid spread of mobile technologies. Some of these technologies include PDA's, GPS units, music players and many more [2]. One such technology that has made a huge impact commercially is mobile phones.

Currently the majority of mobile HCI research focuses on the devices themselves, from how to accommodate small screens to establishing more reliable communications[12]. Within the last decade we have reached the point where we cannot think of devices in isolation; instead we need to think of the larger social and contextual factors surrounding mobile device use. Desktop HCI has seen this research go beyond the GUI; likewise mobile HCI research has to be seen as going beyond the device [13].

With mobile markets being more competitive than ever, mobile operating systems have to constantly create new capabilities, applications and interfaces in order to increase and maintain their market share. Currently the "big players" that dominate the operating system market share according to Gartner are Android and iOS with 52,5% and 16.9% respectively and Microsoft only taking up 1,5% of the total market share[4]. Despite this, many predict that Windows mobile market share will increase strongly between now and the following year with estimated growth of 183%[6]. What sets Windows mobile apart from the rest of its competitors is its unique tile interface. This interface was designed to give a highly customizable experience to maximize the amount of relevant information displayed to the user.

In the sections that follow I will take an HCI approach to discuss the notion of extending the windows mobile tile interface to represent people. I will be doing this by looking at certain design aspects that must be taken into consideration, which are mobility, population, limited input/output facilities and looking at levels unfamiliar to most desktop users[2]. In each section I shall make critical comparisons from various literatures and finally end with a conclusion looking at the research upon which Windows tiles are based.

## **2. Critical comparison.**

### **2.1 Designing for mobility**

The world today can be a highly stressful place especially if your occupation requires you to be on the move. Mobility becomes a large issue, as users don't have access to office equipment such as desks etc. and are therefore reliant on working with small devices. The environment these users are in may be far from ideal working environments and these environments will drastically change as the user moves[2].

The concept of mobile phone mobility can be very vague if not represented in the correct context. Devices such as mobile phones and PDA's are considered mobile because users carry them around. Some devices may move themselves such as robots and some devices may be embedded in moving objects such as cars. Some literature suggests that the issue of ubiquitous computing focuses on making the device disappear into the environment [1]. However I tend to agree with the literature by A. Dix et al. in which it is stated that ubiquitous computing should rather be focused on an expectation that particular devices are normally available and working together to provide some sort of functionality [3].

According to the journal article, "Exploiting Context in HCI Design for Mobile Systems" written by T. Rodden, K. Chervest et al. [3] the different levels of mobility can be disentangled into three dimensions to classify mobile systems. The first of these is to think about the level of mobility within the environment. These can be fixed (device is stationary), mobile (may be moved by others) or autonomous (may move on its own). The level of mobility for our Windows mobile application would fall under mobile. This is because our application deals with people and location and in order for files to be transferred successfully a user will have to be in close proximity of another user. The next dimension considers the level at which devices are related to other devices in the same environment. A device may either be free (the device is independent of other devices and is self contained), embedded (the device is part of a larger device) or pervasive (the functionality provided by the device is spread throughout the environment). Our windows application can be seen as pervasive as devices are related to one another to perform certain functionalities such as file transfer. The final dimension to consider is the extent to which a device is bound to a particular group or individual. The three different types of classes can be seen as personal (the device is focused on supporting one person), group (the device supports members of a group such as a family), public (the device is available to a wide group). For this dimension our application would fall under the group level. By extending the notion of a tile users would be able to create a tile representing a person whom they would have as a contact thus the application would be supporting contacts as a group [3].

As we consider a mobile system, the issue of mobility is of great importance and cannot be ignored. As file sharing becomes popular users want to deliver files across networks as fast as possible; this may occur when the users are not in proximity of another user as they may be travelling. This could be a potential flaw to our application that we will need to consider when dealing with mobility.

## **2.2 Designing for a widespread population**

The world we live in today is vast and the population of the earth is forever growing. As people come from different backgrounds, some users will not have any formal training in technologies such as mobile phones and will see them as devices to be used and not computers to be maintained[2]. When designing a mobile system, this needs to be taken into consideration.

With the increasing number of older users as a demographic group, one would expect them to have a proportionately large share in the mobile market. However this has proven not to be the case as mobile phone usage is skewed towards younger users [11]. With this fact in mind and taking into account the nature of our application is file sharing, our application wont necessarily be geared towards the older generation but rather our main focus when designing the system will be towards the younger generation.

## **2.3 Designing for limited input/output facilities**

There are certain input/output facilities that mobile phones provide that designers have to look into when building a mobile system. Some of these facilities include screen size, sound and keyboards[2]. In order for the mobile system to be successful designers need to analyze the limitations of these facilities provide for a particular mobile system and how to overcome them.

Screen sizes for mobile device have always been a major design issue for designers. Essentially what users will want is for a mobile device to operate like a desktop computer but the screen size seems to be contentious issue according some literatures. “As mobile technology improves, the features of mobile devices will become equivalent to those of desktop computers, except for the screen size. Some mobile devices, such as the Nokia 9290 communicator, have larger screens, but even these remain much smaller than the smallest desktop display” [10]. There has been some research looked into by Jones et al. where navigation activities on small screens were compared with the same activities on big screens and found that the number of scrolling actions increased significantly on smaller screens, ultimately lowering the performance [16]. Although there have been major developments of screen sizes in resolution in terms of colour support and pixels per cm, the screen sizes will remain small because of the need for portability and will continue to plague designers as a design issue. With the limited screen size that mobile devices posses, we need to come up with ways to allow users to access the maximum amount of content that could be displayed to them using our application. An interesting literature by Kamba et al. discusses the possibility of maximizing the screen usage. Here they developed a semi-transparent widget much like a button that overlaps the main body of content to make the most of a small screen [15]. This overlapping meant that small screens don’t have to set aside a large portion of their space for infrequently used widgets, making it easier for users to access more content. This idea could be useful to implement within our Windows mobile application to make full use of the screen.

Most mobile phones make use of keyboards. These keyboards are of limited size making them difficult to use. According to survey done by S. Kristoffersen et al. they

found that keyboards limited the potential a mobile device could bring: “In the study of mobile surveyors we also found several instances of situation in which the potential for mobile computing today is limited due to the prevalent reliance of keyboards and pen input” [8]. Keeping this in mind, we have to make minimal use of the keyboard within our Windows application. Instead we will allow users to drag and files onto a particular persons tile. In this way we are limiting the use of the keyboard, as users don’t have to type the person’s name they wish to send the file too.

## **2.4 Designing mobile systems for levels unfamiliar to most desktop users**

One of the keys to successful desktop computing is multitasking and support for task interruption. With regards to mobile devices, the likelihood for interruptions is much higher given the environments in which the device will be used [2].

When designing mobile system, designers must take into account the consistency between mobile phones and desktops. This consistency allows desktop users to make the easy jump from a desktop to a mobile phone. For example, a user may be reading a PDF on their desktop and want to transfer it to their mobile phone to read elsewhere. In this situation consistency must be maintained between the desktop computer and the mobile phone. According to the literature by J. Gong et al. error prevention and simple error handling needs to be handled in the same way as desktop interfaces: “Preventing and handling errors on mobile interfaces are similar to those for desktop interfaces, although the need becomes more critical due to the more rapid pace of events in the mobile environment. Error prevention also needs to take the physical design of mobile devices into account” [5]. Error prevention plays a vital role in our Windows application due to the rapid pace of the environment to which it will be exposed. Because our application may deal with large data files, it may be very time consuming to transfer files and there would be unnecessary time wasting if users are not familiar with handling error messages.

A strength that our application will have when it comes to users making the transition between their desktop and a mobile phone is the introduction of tile interface to Windows 8 [14]. This means that users utilizing Windows 8 will already have a feel for how our application would work on a Windows mobile phone; there is even the possibility of extending our application to desktop computers. By doing this, we could allow easy file transfer for groups of people, such as students going to a LAN party, or people wanting to transfer large files to one another without the use of a USB.

## **3. Conclusion**

In order for a mobile operating system to become successful it has to offer something new and innovative. Within Windows mobile, the tile interface is what will set it apart from its competitors.

This tile interface has been influenced by a number of designs such as The International Typographic Style (Swiss graphic design) that emphasizes cleanliness, readability and objectivity[7]. The unique characteristics that Windows adopted from

this design are asymmetric layouts, use of grid and ragged right text[7]. Inspired by this typographic design Windows came up with their very own design and called it Metro. Bill Flora, one of the designers of Windows phone, also mentioned that one influence of the Metro design came from signs commonly found at public transport systems: “Mr. Flora drew inspiration from the signs in airports and other transportation hubs” [9]. The principles of Metro were then implemented in Microsoft’s operating system for Windows phone, the Xbox 360 dashboard and Windows 8[17].

As the competition for mobile operating systems intensifies, designers will have to be on top of their game to come up with new and innovative ways to please their target audience. Currently the notion of windows mobile tiles are seen as mobile applications, but if you could extend this notion into something much more, there is a great opportunity to unlock something extraordinary.

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