IMPLEMENTATION OF WIRELESS DRAG-AND-DROP TECHNOLOGY ON EXTERNAL DEVICE USING ANDROID APPLICATION

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ABSTRACT

Many interactions naturally extend across smart-devices and phones with larger screens. Indeed, data might be received on the smart device but more conveniently processed with an application on a larger device, or vice versa. Such interactions require impulsive data transfer from a source location on one screen to a destination location on the other device. We introduce a wireless cross-device Drag-and-Drop technique to promote these interactions involving multiple touchscreen or non-touchscreen devices, with minimal effort for the user interaction. This system is work on wireless communication where user have only drag the file on cross devices and choose which application should receive the data on receiver side.

Keyword:-*Mobile devices; data transfer; drag-and drop; laptop or PC*

1. INTRODUCTION

Interactions repeatedly extend beyond a single device. A phone number is more easily searched on a big screen, but once found the call is issued with the dialing. A photo can be instantly snapped with a mobile, but its integration in a document is easier on a bigger screen. Friends text us place address on our mobiles, but route directions can be better looked up and printed from a big screen device. We might also look up an address on a computer screen, and then use it on our smart phone to navigate to the location. All these are examples of interactions that require users to select data on one device and apply it to another device. In this situation, current practices hinder this process by adding extra steps that divert the users from the primary goal of applying data from one device to another. Frequently, users recur to typing names, numbers or addresses off a screen because transfer via a sharing protocol is more cumbersome. This type of interaction between situated devices and smart phone has been widely studied including recent work focused on interaction with mobile as these have become data-rich devices. However, we are concerned with cross-device interactions that have definite characteristics. The interaction is spontaneous, and the data concerned frequently only emerges during interaction with device, for example as a result of a search, or of a communication received. The data does not precept the application, and users might want to use data items in various ways, for particular apply contact data to an address book, navigation app, or phone application, depending on their interaction aim.

In a previous study we sought to discover what methods users currently apply to face these needs and which ones they would rather prefer using, if there were no technological drawbacks and anything was possible. In this paper, we contribute implementation of wireless Drag and Drop technique on external device using android application for

fast interaction between smart phones, touchscreens and non-touchscreen devices.
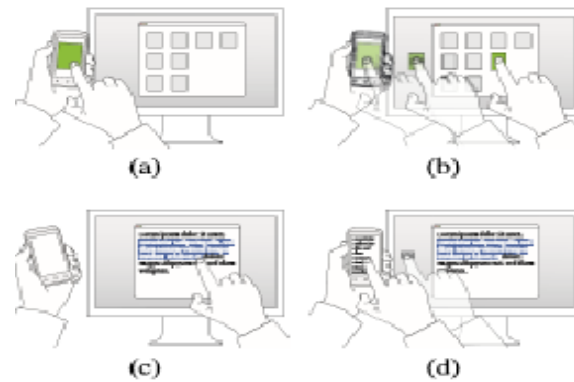

Figure 1: Drag-and-Drop concept: (a) a user holds the mobile phone next to the desktop screen and selects a data item. (b) The user drags it inside the screen. (c)In the other direction, a user selects data on the PC and (d) drops it on the phone.

Figure 1 illustrates the concept: showing selection of an object on the smart phone (a) and drag-and-drop transfer operation to a desktop application (b), and selection of text or file on the desktop (c) that is then dragged and dropped onto the smart phone (d). We have design a prototype system that determine Drag and- Drop in two ways: with a custom application and generic interface. The generic interface is realized with a Drag-n-Drop application on the smart mobile phone that identifies objects dragged onto the device and provides an interface through which users can drop the objects on the available target applications or device. We have also implemented a custom email application to exhibit how Drag and- Drop might be used if it were constitutionally supported.

2. PROPOSED MODEL

This proposed model we are providing Wi-Fi mechanism for sending and receiving data. In this model both the devices are not necessary to be touch-screen device. Data can be sent to multiple devices. Security is provided by giving a pairing mechanism to the user.

2.1 DESIGN OF DRAG-AND-DROP

On a conceptual level the Drag-and-Drop technique provides users to drag data from a desktop screen and drop it on mobile devices and vice versa. It is performed through one single uninterrupted touch gesture and hence, it is not requires that both screens that support touch input. The technique itself is express into four contiguous phases: placing the mobile device in proximity of the desktop Wi-Fi range (1) establish the source object of the drag-and-drop action (2), performing the actual movement on other screen (3) and finally, establish the target destination where the content being dragged will be "dropped" (4). The first phase builds on the assumption that placing the smart mobile device next to the screen will form an ideal "link" between cross devices providing users to perceive the two different screens as neighboring. This requirement is mainly needed to instill the idea that it is possible to drag data "outside" of the physical boundaries of one screen and inside of the another screen one due to their close proximity to each other. In fact, the devices have no knowledge of their particular locations and do not need to: it makes the way it works more easily acceptable by first time users. Although we have mainly concentrate on the technique itself, this "linking" moment could be also used to authorized the pairing itself between the different devices. In our implementation we used an explicit point-to-multipoint connection which has to be initiated before each session and lasts until the smart device is absolutely disconnecte
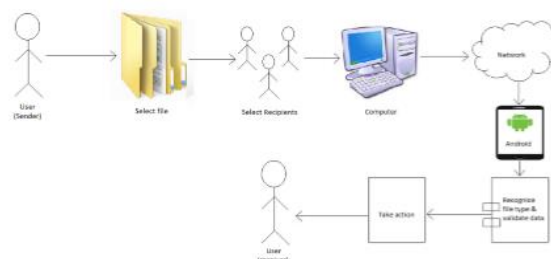
2.2 IMPLEMENTATION

Figure-2: PROPOSED MODEL

Fig 2 shows the Drag-and-Drop operation. Our model implementation consists of a server application on the PC and two different clients on the mobile phone, communicating over a wireless network. The desktop, a Windows 7 PC runs the PC Drag Detector is an application that handles touch detection and networking. The smart phone, an Android device, alternatively runs one of the two client applications which address different usage scheme: first, the Drag-n-Drop Application enables existent applications on the phone (e.g., a map applications, image galleries or contacts application) to use Drag-and- Drop without any modifications; second, the email client establish an application extended by Drag-and-Drop to simulate a possible future native integration of our technique by the operative system.

3. THE DRAG-AND-DROP APPLICATION

The Drag-n-Drop application is based on android platform which is the first of our mobile implementations, connects Drag-and-Drop to existent applications on the same phone. It handles bidirectional interactions between PC and smart phone, using two different User interface described in the following.

3.1 RECEIVING DATA FROM THE DESKTOP

After starting the Drag-n-Drop application it represents a grid of application icons to the user, each representing a distinct application class. Together, these various classes address a range of typical usage scheme (Figure 3c). In particular, we are covering i) phone dialers, ii) contact managers, iii) text messaging, iv) email clients, v) maps and vi) picture viewers. For example, after finding a hospital while browsing the web on the PC, the user can simply select the parallel address and drag it onto the maps icon on the smart phone to instantly start the navigation. By applying data onto a particular application class, the user authorized how the phone handles the particular data. This basic concept easily prolong to other use cases. For instance, to call a number displayed in a PC application, the user applies it to the dialers icon to directly get connected. In doing so, Drag-and-Drop technique offers a fast and convenient alternative to manually transferring the required information from the PC to the smart phone, for example by re-typing it. From a technical point of view, once the user start a drag gesture on the PC, the finger and cursor will ultimately enter a drag detector window. The desktop application then queries the data to detect its underlying type and provides feedback on the smart phone once the finger and cursor enters its screen. Then, an application icon representing the dragged data is displayed as a preview and moves along the side of the user's finger (Figure 3c). Feedback about the validity of the drop location on the smart phone is shown to the user through background changes of the presently highlighted application class. When the finger and cursor is released, the dragged data is free to the chosen class. The Android operating system determines eligible applications that can handle the data from those present in the user's device.

3.2 SENDING DATA TO THE PC

The Drag-n-Drop Application also provide dragging items from the smart phone to the desktop to address situations where data originating from a smart phone device is better viewed or edited on a bigger screen. In order to backing this, we use Android's built-in share feature, a method to internally share data between different applications. In particular, users have to first select the data or file they wish to apply on another cross device from within an arbitrary application on the phone (e.g., by opening a image in the gallery viewer). Second, they appeal to share feature which will bring up the Drag-n-Drop application in send mode.

Figure 3: To send an email address available on a PC to a mobile email client, the user can drag it towards the phone (a) once on the mobile, the user can drop it over the relevant field. To copy text available on a mobile to a

desktop application, the user selects it normally on the mobile and drags it towards the screen (c) once on the desktop screen, the user can release the finger over any application accepting text to apply it there.

Due to platform rule users cannot initiate a drag gesture directly from a smart phone application. Thus, users are shown a list of application icons representing data types. Compatible icons will be highlighted, in situations where data might be treated in various ways. From a technical context, once the finger enters the detector window on the PC, the dragged data will be encapsulated into a simulated local drag-and-drop event, transparent to both the user and the target application on the desktop.

4. THE PC DRAG DETECTOR

The PC Drag Detector is based on java platform which is a background hidden application that enables Drag-and-Drop technique on the desktop. It detects drag events at the system level as well as flavor of data to be sent (text file, binary file). When a drag gesture is identifying, it displays a detector window at the sides of the desktop screen. Once the user enters or exits the screen, the compatible window captures outgoing or incoming data (Figure 4b). Depending on the drag operation data is sent over the network to the smart phone or received from it to complete the drag gesture operation on the desktop. After which the detector window is hidden.
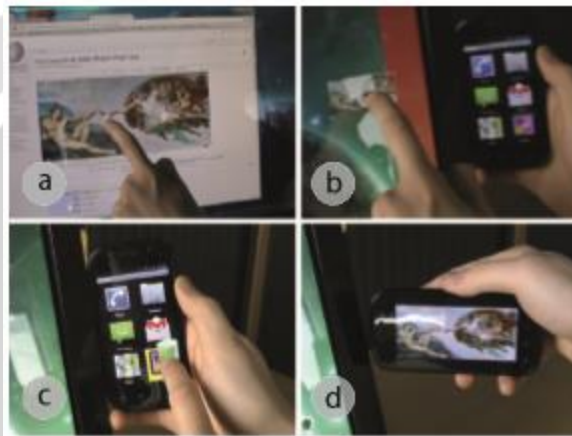

Figure 4: Picture transfer from desktop to phone: the user selects a picture displayed in a web page (a) and proceeds to drag it across the screen and over the semi-transparent detector window (b) the drag gesture is continued on to the mobile screen where the user drops the picture over the viewer icon (c) finally, the picture is automatically displayed (d) The technique also works in the opposite direction.

5. CONCLUSION

This paper proposed a simple drag-and-drop touch screen and non-touch screen interface that allows user to intuitively share data between cross platform that is mobile to PC and vice versa. Through touch gestures, the cross-device Drag and-Drop technique allows a practical solution to a need that is still today not adequately supported. The user feedback we gained highlighted its positive aspects of being easy to learn and perform. We plan to further investigate how to adapt the technique for use in public and semi-public settings such as airports, train station, museums, retail stores, etc.

6. ACKNOWLEDGEMENTS

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