Help Kiosk 2.0: A Tabletop Display to Support Older Adults in Learning How to Use Smart Devices for Personal Health Information Management

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Abstract

With the rapid growth of new technology, some older adults may face challenges learning how to use smart devices. The initial Help Kiosk (HK) was designed to support older adults in learning how to use a smartphone by integrating a large display to augment the smartphone display. However, this system has only been examined in the context of basic smartphone training and required users to switch their attention between different areas of the display. Our work explores the use of a 40" tabletop display to support older adults in learning how to use multiple smart devices with a goal of reducing the issue of divided attention. Our updated design (HK 2.0) builds on the independent, self-directed learning environment by introducing a collaborative learning feature that provides older adults with remote support by family and friends. HK 2.0 also focuses on the onboarding and complex tasks of smartwatches and tablets for personal health management. We share the design of HK 2.0, including our design requirements, key features, and prototype.

Keywords: Older adults; seniors; learning; large display; smartwatches; tablets; user manuals; health; guidelines; personal wearables

1 Introduction

Smartwatches and mobile health apps can assist older adults (60+) in managing health problems, such as high blood pressure, high blood cholesterol, and other chronic conditions by monitoring information such as one's heart rate, steps taken, sleep quality, and stress levels [6][8]. Prior work has explored older adults' interest in using technology to manage their personal health, including tracking their heart rate, maintaining an exercise diary, and monitoring stressful events [1]. While there has been an increase in technology applications designed to support people in personal health management, few studies have been conducted to explore older adults' use of smartwatches for health tracking [8].

Moreover, the overwhelming amount of information and features that come with such technologies makes them challenging to learn and adopt, especially for older adults who may not have the same opportunities and motivations for training (e.g., through work) as younger adults [4]. These challenges are further exacerbated by displays that are generally too small to provide effective interactive help [5][9]. Thus, although technologies offer a means of tracking and sharing health information with family members and medical professionals, barriers to adoption often result in passive technology use and limited self-health monitoring.

Studies have explored how older adults have adopted independent learning techniques, such as instruction manuals, when using new technologies [2][3][5]. In particular, the initial Help Kiosk (HK) design was based on the concept of instruction manuals and provided a self-directed learning environment where older adults could control their speed and learn basic tasks on mobile devices individually via an augmented display [5][9]. However, to date, its approach has only been examined in the context of smartphone training [3][9]. As older adults have become more comfortable with basic tasks on mobile devices, challenges remain with more complex ones [4][8], including configuration tasks like the ones needed to use smart devices. Moreover, while independent learning is important, older adults also enjoy learning collaboratively with their spouses, other family members, and those within their own social network [4][5].

In this paper, we build on Help Kiosk (HK), updating its design by combining the learning of multiple devices on to a single large interactive tabletop display and exploring this within the context of smartwatches and tablets (see Figure 1). We also extended our exploration from an independent learning approach to include a collaborative learning approach where older adults can receive support from family members. Our overall research goal was to design, build, and evaluate an accessible technology for older adults that supports independent and collaborative learning and the use of smart devices for health information sharing.

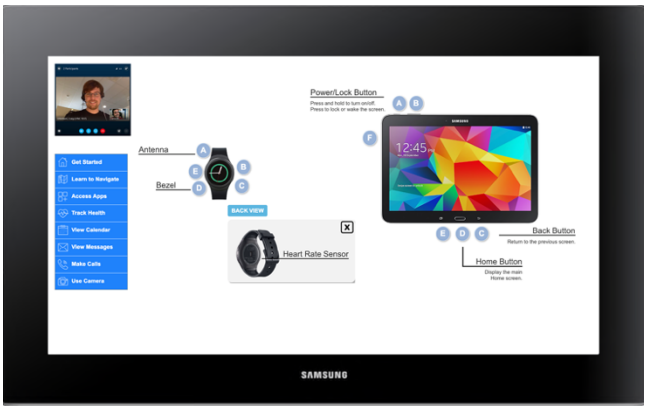

Figure 1: Medium-fidelity prototype of "Get Started" within Help Kiosk 2.0. The smartwatch and tablet are physical devices placed on the tabletop's surface. Instructional annotations automatically appear around the device.

2 The Design of Help Kiosk 2.0

Based on the concept of the initial HK, the updated HK 2.0 learning system allows users to place their smart devices on a large tabletop in order to learn how to use key features of a smartwatch and tablet. Through a navigation menu that lists key learning topics, instructional information displays around the devices so that users can explore and select elements more efficiently. The goal is to have interactive guidance that supports older adults in learning how to use their smart devices and to track their health information. Our prototype uses a Samsung Surface 40 tabletop, a Samsung Gear 2 smartwatch and a Galaxy Tab 4 tablet; however, the core features should be adaptable to other similar devices.

2.1 Design Requirements

We began our design process by reflecting on prior work describing design guidelines for older adults to support learning [2][4][5][6][10]. We then reviewed online videos that demonstrated the capabilities of surface computing (in general) and the Samsung

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Surface 40 (specifically). Additionally, we reviewed videos that introduced the core features of the Samsung Gear 2 and Galaxy Tab 4. This helped us understand the potential interactivity afforded by the interactive tabletop and also provided us with an introduction to the products out of the box. Following this, we stepped through the original Help Kiosk to understand its core features to support older adults in learning how to use smartphones. Based on this prior work, videos, and original HK system, we decided on three design requirements for our learning system.

1. *Known Guidelines for Senior-Friendly Instructions*: Previous studies have found that older adults generally prefer learning independently at their own pace [3]. Our design assists older adults in self-directed learning by providing a large tabletop display upon which devices can be placed. This maximizes their attention between the instructions and devices and increases the legibility of all the content to be displayed [2]. This design also incorporates known guidelines for senior-friendly product instructions [2]. This includes detailing information that is relevant at each step, removing irrelevant content, using familiar words, and labelling key elements in figures [2].
2. *Onboarding and Health Information Management:* Setting up a device can be challenging and complex; as such, the onboarding process is a key aspect of the user experience that offers instructional text and interactive materials to help new users learn an application's key benefits [7]. Our design includes key onboarding principles, including using an action-oriented approach and anchoring the tool in the task domain [7], encouraging and supporting exploration, and selecting instructional activities that are real tasks.
3. *Collaborative Learning and Social Connectedness:* Prior work has also found that the adoption of technologies was influenced by others in their social network, including peers, spouses, and other family members where active engagement in social activities was important in maintaining healthy aging [6][9]. Our design includes a video chat feature that offers an optional collaborative learning environment for older adults. This connects older adults with those in their close social network and facilitates screen sharing in order for friends and family to provide remote support during the learning process.

Considering these design requirements, we then iteratively designed and developed Help Kiosk 2.0, which contains three key features and eight learning topics. We discuss each of these next.

2.2 Key Features and Learning Topics

HK 2.0 combines the learning of multiple devices on to a single large 40" interactive tabletop display (Samsung SUR40). There are three core components of HK 2.0: a video chat feature (Help); a navigation menu for eight key learning topics; and the central area where the devices (smartwatch and tablet) are placed. The Help feature allows users to video chat and screen share HK 2.0 to ask for assistance from their family members. The key learning topics allow older adults to explore and understand the core functions of a smartwatch and tablet. The central area contains all the instructional material (including text, images, and videos) to support learning how to use the devices. These learning topics include: *Get Started, Learn to Navigate, Access Apps, Track Health, View Calendar, View Messages, Make Calls,* and *Use Camera*.

2.3 Scenario of a Collaborative Learning Experience

Chris is a 60-year old public transit bus driver with basic technology skills, such as making calls, and taking pictures on his mobile phone. When he needs technical support, he usually calls his only daughter, Jessica, who lives in Toronto. Chris wants to learn how to use his smartwatch and tablet to track his steps and jogging distance. Since Chris is unfamiliar with technological devices, his daughter decides to teach him by video calling. There are two tasks involved: sign up an account and learn how to use the step counter on the device. First, Chris places his phone and smartwatch on the tabletop interface. Uncertain as to what to do next, he taps the Help button to call Jessica. She starts to guide him using Help Kiosk 2.0 step by step by asking him to tap Get Started from the navigation menu and registering an account. Once completed, she asks Chris to tap Track Health and follow the instructions to learn how to use the Steps feature.

2.4 Medium-Fidelity Prototype

Our prototype of HK 2.0 was developed using Axure, a wireframing and prototyping tool. It was designed with three key features: a video chat feature integrated with Skype; a navigation menu for eight learning topics; and the area where the devices are placed and instructional information displays. Figure 1 shows the "Get Started" screen of the tabletop display. After placing the smartwatch and tablet on the large tabletop, older adults are able to view main instructions around the devices. Images are also incorporated so that users can learn about features located on the front, back, and sides of the devices.

3 Future Work

We next plan to conduct interviews with older adults and their family members to understand the challenges faced when learning (and supporting) the adoption of smartwatches and tablets. We will also conduct observation studies to evaluate the Help Kiosk 2.0 system with older adults so that we can iterate on the design and make modifications to improve older adults' learning experiences.

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