Chapter 13
Time for a Change:
Designing a Mobile Application to Assist People With Intellectual Disabilities

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ABSTRACT

In recent years, the use of smartphones by people with intellectual disabilities (ID) has increased, leading to the development of applications designed to ease and improve their lives and independence, and help them integrate into society. Designing applications tailored to the needs of these users is complex, particularly in terms of accessibility and usability. This chapter presents a case study of the design and development process of a dedicated application aimed at helping people with mild ID in handling cash transactions. The chapter explores the design principles of mobile interfaces for people with ID. It introduces the use of the design thinking methodology, which focuses on user-centered design and helps gain an in-depth knowledge of the end users and their needs. Based on the performed user research, recommendations for the design of such applications are highlighted.

INTRODUCTION

Society's perception of intellectual disabilities (ID) has changed greatly over the years. Nowadays, there is an attempt to embrace and incorporate people with ID. Instead of regarding disabilities as a medical problem that requires intervention, there is an attempt to acknowledge people with ID as integral and equal parts of society. In order to accomplish this inclusion, there is an increasing use of assistive technology to improve the quality of life, the sense of competence and the level of independence of people with ID (Agree, 2014; Borblik, Shabalina, Kultsova, Pidoprigora, & Romanenko, 2015; Sauer, Parks, & Heyn, 2010). Assistive technology helps to minimize the gaps between people with and without disabilities by circumventing the limitation in order to accomplish a task and/or improving task performance (Dekelver et al., 2015).

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Smartphones, which have become an integral part of our lives, offer diverse opportunities to ease and improve the lives of people with ID (Darcy, Green, & Maxwell, 2016; Igual, Plaza, Martin, Corbalan, & Medrano, 2013). Smartphones are becoming more user friendly, hence their adoption by people with ID is rapidly growing (Agree, 2014; Darcy et al., 2016). The applications available for smartphones can help in a variety of areas, including personal communication, memory enhancement, health control, navigation, emergency support and more (Morris, Jones, & Sweatman, 2016). Moreover, the technological development of the devices is a fertile ground for the development of innovative applications adapted to the specific needs of people with ID. However, alongside the advantages of these applications, there is a complexity in their development, especially in terms of accessibility and usability. In order for the potential of these applications to be fully realized, these issues must be considered and the necessary adjustments must be made, allowing users to easily use the applications (Agree, 2014; Darcy et al., 2016).

The main goal of this chapter is to examine the design and development processes of a mobile application developed for people with ID, with an emphasis on the underlying principles of accessibility and usability. The chapter focuses on the difficulties of people with ID in managing their money and the technological possibilities to overcome these difficulties.

The chapter presents a case study of designing an application named "Shkalkalim" for people with mild ID in order to help them manage their money and handle daily cash transactions. It will define the problem, discuss the evaluation process carried out, and outline a possible solution. The chapter describes the process from the needs analysis phase to the development of the application. This procedure is based on the Design Thinking methodology, which focuses on user centered-design and the use of creative thinking for problem solving. The principles of the methodology will be presented and described by definition and by the way they were implemented in this process.

In the course of the study, interesting insights emerged regarding the effectiveness and usability of the interface following a real life pilot of the application with the target population. The chapter describes the feedback received by the users and the adjustments made in light of it. Moreover, it highlights recommendations for proper implementation and training of people with ID with such applications. The chapter concludes with future ideas and directions that can be deducted from the "Shkalkalim" application for developing other applications and features that can support the needs of people with ID.

BACKGROUND

Intellectual Disability

According to the World Health Organization, 15% of the world's population are people with disabilities (World Health Organization, 2011). Of these, close to 200 million people have intellectual disabilities (Special Olympics, 2009).

Intellectual disability (ID) is defined as a neurodevelopmental limitation that effects intellectual functioning and adaptive behavior, and appears before age 18. This disability effects mental/conceptual skills (e.g. reading, writing, arithmetic, reasoning), social skills (e.g. communication, understanding of social rules and norms, social judgment and empathy), and practical skills (e.g. day-to-day independence, money management, task management, personal care and work responsibilities). ID is classified into different levels according to the individual's IQ and the degree of the person's dependence on his surrounding: mild disability (IQ 50-69), moderate disability (IQ 35-49), and severe/profound disability