

# Chapter 28

## Developing Assistive Interventions: Promises and Challenges

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### ABSTRACT

*Digital interventions have received a great deal of attention from researchers and scholars. Development, implementation, and evaluation of behavior change, and assistive technologies for improved living are being increasingly studied. Assistive technologies in particular have opened up venues for technological advancements for supported living for people with mental and physical disabilities. This chapter is conceptual in nature and discusses the emergence of digital interventions for improved living. Further advancement of a relatively new research field of Persuasive Technology is discussed that is largely related to supporting healthy living. The aim of the chapter is to review early digital interventions and emergence of behavior change and assistive technologies. It highlights potential benefits that could be realized through the use of carefully designed behavior change and assistive technologies. In addition, several key challenges, promises, and pitfalls are briefly outlined. Presented knowledge would help researchers and practitioners in abstracting, designing, and evaluating assistive technologies.*

### BACKGROUND

The research field of assistive technologies is bringing new research challenges and opportunities in developing systems that could support people to adopt desirable behaviors and live a healthier life. Technologies for assisting people in overcoming depression (van Straten, Cuijpers, & Smits, 2008), obesity (Harvey-Bernio et al. 2010), anxiety (Andrews, Cuijpers, Craske, McEvoy &

Titov, 2010), sleep deprivation (Langrial, Oinas-Kukkonen, & Wang, 2012), visually impaired and dementia (Robinson, Brittain, Lindsay, Jackson, & Olivier, 2009) have been well-studied and reported. Digital interventions (DIs), automated/interactive web-based interventions, Persuasive technology (PT) and Assistive Technologies (AT) have the potential to reach larger population with reduced costs. Several terms have been coined to describe assistive technologies for physical and

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mental well being. Among others, these include electronic therapy, cyber therapy, eHealth, digital interventions, and online counseling (Barak, Klein, B. & Proudfoot, 2009).

Generally speaking, there are three separate categories of such technologies with elusive yet substantial differences. Simplistically, these technologies could be classified as Digital Interventions (DI), Persuasive Systems (PS) and Behavior Change Support Systems (BCSSs). Digital interventions have been more or less focused on intervening human behaviors in the area of preventive health primarily through digitized reminders. Persuasive technologies have emerged as a more sophisticated research field where IT artifacts have been developed to address behavior change in a broader scope and software functionalities such as reminders, rewards, social learning are often employed.

## **DIGITAL INTERVENTIONS**

Information systems that aim to change behaviors are often considered as digital (behavior) interventions (Reeve & Dunbar, 2001). It could be cautiously argued that labeling behavior change technologies as digital interventions is rather simplistic. The research field of digital interventions dates back to early 90s where interventions were primarily employed and evaluated in the field of preventive health and medicine largely through intermediations (paper-based and/or telephonic reminders). A considerable number of studies have been conducted that aimed to intervene health-related behaviors. For instance, Reiter, Robertson and Osman's (2003) STOP system studied smoking behaviors using digitally generated and letter-based interventions: Revere and Dunbar (2001) argue that tailored digital interventions are moderately effective. Likewise, Brendryen and Kraft (2008) studied web-based digital intervention for smoke cessation. The intervention was conducted using the Internet

and telephone. Brendryen and Kraft (2008) argue that digital interventions showed promise in supporting people adopt healthy behaviors. Noar, Harrington and Aldrich (2009) report that a substantial amount of work has been done in personalizing interventions in the health domain. They base their illustration on their review of 37 health behavior intervention studies. Noar et al. (2009) also performed a meta-analytic review of 57 studies evaluating health behavior interventions and report that tailoring can bring effectiveness to digital interventions in the health domain.

## **PERSUASIVE TECHNOLOGY**

The research field of persuasive technology (Fogg, 2002) has received notable attention from researchers, academics and practitioners for over more than a decade. Persuasive systems have shown promising outcomes in terms of promoting healthy behaviors and in parallel reducing costs associated with healthcare. Fogg (2002) has defined persuasive technologies as information systems that are intentionally abstracted, designed and employed to bring desirable change in people's behaviors and/or attitudes. Fogg's inspirational work originates from human psychology. He lays emphasis on three key factors when it comes to changing human behaviors and/or attitudes. These factors include an individual's motivation and willingness to adopt healthy behaviors, her ability to perform a desired behavior and need for timely reminders (Fogg, 2009). The research field of persuasive technology underlines the capacity of Information Systems as a tool for persuasion where technology acts as a medium and social actor (Fogg, 2002). Although the description of persuasive technology is convincing however there is a seeming weakness as pointed out by Kelders (2012). Kelders (2012) outlines that persuasive technology as a research field is somehow limited to user-computer interaction and neglects the critical characteristic of computer-mediated communication between the

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