Digitalisation in Health Care and Elderly Care Services:
From Potholes to Innovation Opportunities

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ABSTRACT

The purpose of this paper is to investigate the innovation opportunities related to digitalisation in health care and elderly care services using a "pothole approach". The study focuses on two innovative e-service concepts developed in Finland for enhancing the well-being of senior citizens: The hStick (health stick) and the mStick (memory and reminiscence stick). The data consist of 59 thematic interviews and focus group meetings, observation data and diaries collected in pilot cases. The innovation opportunities related to the novel e-service concepts are identified and explored using the pothole approach. The potholes in the stick system are first identified and then studied as sources and opportunities for potential future innovations. This study offers a novel perspective on research concerning technology and e-services and the various innovation opportunities made possible once technological and other shortcomings have been identified.

INTRODUCTION

New approaches and innovations in the field of elderly care are necessary to respond to the challenges of an ageing population. High hopes have been placed on digitalisation and gerontechnological innovations such as e-health, various types of monitoring, home automation, robotics, and simpler applications and gadgets. While these technologies aim to facilitate and replace human work, they may also replace human contacts (Sharkey and Sharkey, 2012). Technology in elderly care is often characterised by black and white thinking: an overly optimistic view of technology might prevail in which technology is believed to solve all kinds of problems, or alternatively, technology might be seen as causing additional problems. Therefore, we should contemplate whether it is possible to combine a critical approach with an opportunity approach to digitalisation.

Currently, there is general agreement that technology has social aspects that must be considered, for instance, the usability and acceptability of the products. Gerontechnology refers to both the interdisciplinary study of technology and technological devices designed to address the needs of an ageing society (Harrington and Harrington, 2000), which means that gerontechnology is not purely technological but also social, and includes a service element. Gerontechnology has applied a systems

approach between people and their technological environments and the user interface connecting them. Both the system and the user are dynamic: they are in constant change (Bouma, 1992).

This study builds on the ideas of the socially constructed and systemic character of innovations. Innovations have traditionally been seen as products of high-technology fields, but lately, the definition of innovation has been expanded (Damanpour, 1996; Plessis, 2007). One expansion has been an emphasis on service and social innovations alongside traditional technological or product innovations, which can be seen when investigating technological devices related to ageing, such as the stick concept described in this study. Creative ideas and innovation potential are likely to be found in a wide range of knowledge, skills and experience (Hyypiä and Parjanen, 2013).

This study focuses on two innovative e-service concepts developed in Finland for enhancing the well-being of senior citizens and the service system related to elderly care. The hStick (health stick) is a modernised version of a medical information wristband or card. Various health-related data may be saved on the hStick, which functions as a safety device in acute illnesses or injuries, and as a means for self-care and promotion of one's own health. The mStick is a memory and reminiscence stick that stores biographical memories and supports and tests memory-related abilities. Personal biographical documents can be saved on the mStick, its memory tests and game applications can serve those with memory problems, and active elderly people can use the device for meaningful entertainment. The mStick is also an assistive device for care workers.

The conceptual foundations of the sticks lie in socio-technical relationships and interactions between material and human actors (Latour, 1994). The hStick and mStick are not technical devices only, as they have holistic concepts and interactional aspects; along with the elderly care service system, the sticks provide a holistic opportunity for various innovations. In the stick system, a technological device is connected with a service network and the operation of the system depends on many critical points regarding technology, service processes, information flows, etc. (see also Pekkarinen and Melkas, 2010; Melkas, 2004). These critical points may appear as potholes or shortcomings to be addressed in future development efforts. The potholes can also be seen as opportunities for innovation, because triggers for innovation often arise from practice-based situations, for example, poor experiences with the reliability of technology or unsatisfactory service situations. This study emphasises that even when developing and implementing the technology for ageing, related innovation processes cannot be merely technology-driven by nature. Likewise, for services in particular, it is important to note that the service experience consists of several components and often includes numerous connections between service providers.

The aim of this study is to combine a critical approach with an opportunity approach to innovation. We will identify the potholes in the stick system and investigate them from various angles, while considering the technology itself, the services and the organisational network of the system. The potholes are further studied as sources and opportunities for potential future innovations. The central contribution of the study is to broaden our insight into technological innovations by linking them to other innovation perspectives using the "pothole methodology", a simple, yet powerful approach that originated in the field of information quality research (Strong, Lee and Wang, 1997). The present study highlights that a technological device, such as a health or reminiscence stick, is not created and used in a vacuum: behind the technology, there are acts of service and an organisation, and there are users who have values, health conditions, service needs, etc. All these features and contexts affect the variety of innovation and innovation potential in assistive technology. Broader perspectives and a holistic approach often offer new platforms for innovation linked to a single product, and thus help develop systemic innovations, along with changes at the "landscape" level, which are needed to address the ageing of the population, for instance (Geels, 2002; Geels, 2005). The innovation potential of the sticks relates to e-services and other services, but it is conceptually useful to analyse this innovation potential in a more detailed way, as this study does.

This study offers an easily applicable approach for analysing and developing e-services as multi-faceted systems. Understanding and developing systemic innovation is impossible without a close

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