

## Chapter 3.2

# Managing Mobile Healthcare Knowledge Physicians' Perceptions on Knowledge Creation and Reuse

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### ABSTRACT

Incorporating healthcare information systems into clinical settings has been shown to reduce medication errors and improve the quality of work in general by improving medical decision making and by saving time. This chapter aims to demonstrate that mobile healthcare information system may also help physicians to communicate and collaborate as well as learn and share their experiences within their work community. Physicians' usage of a mobile system is analyzed through a knowledge management framework known as the 7C model. The data

was collected through the Internet among all of the 352 users of the mobile system. The results indicate that frequent use of the system seemed to improve individual physicians' knowledge work as well as the collective intelligence of a work community. The guide for acute care, evidence-based medicine guidelines and information related to drug interactions supported the knowledge creation to a large extent. As such, mobile healthcare information systems may be capable of supporting the different sub-processes of knowledge creation and the knowledge work of individual physicians, and through this also improving the collective intelligence of the work community. Overall, knowledge management seems to be a prominent approach for

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studying healthcare information systems and their impact on the work of physicians.

## **INTRODUCTION**

Personal digital assistants and mobile applications are promising tools for managing medical information and accessing it at the point of care (Ebell et al., 1997). They have been shown to assist in evidence-based practice in a clinical setting and support the educational needs of physicians, nurses and other clinical staff, while drug information, medical calculations, guideline information and administrative tasks have been identified as the most useful resources (Honeybourne et al., 2006). Topics such as e-prescribing (Kushniruk et al., 2005) and patient tracking (Lapinsky et al., 2001) have gained a lot of attention recently. On the other hand, access to medical literature and electronic pharmacopoeias, i.e. drug information, seem to be excellent tools for providing physicians with knowledge at the point of care (Fischer et al., 2003).

Incorporating healthcare information systems into clinical settings has been also shown to reduce medication errors (Grasso & Genest, 2001) and improve the quality of work in general by improving medical decision making and by saving time. Mobile versions of these systems are relatively easily incorporated into the workflow of the physicians (Rothschild et al., 2002) as they can be carried around and used when ever needed, for example during home visits or ward rounds.

In the information systems field the topic of knowledge management has received a lot of attention recently (for an excellent review on the subject, see (Alavi & Leidner, 2001)). Our view on knowledge management is through a conceptual framework known as the 7C model (Oinas-Kukkonen, 2004). It suggests that the seven Cs or knowledge creation sub-processes, namely Connection, Concurrency, Comprehension, Communication, Conceptualization, Col-

laboration, and Collective intelligence, play a central role in knowledge management. According to the 7C model, going through the key phases of Comprehension, Communication, Conceptualization and Collaboration repeatedly, in a seamless and spiral-like way leads into the growth of the organizational or social knowledge, i.e. Collective intelligence.

This paper focuses on mobile access to medical literature and electronic pharmacopoeias, aiming to demonstrate that these may help physicians to communicate and collaborate as well as learn and share their experiences within their user community. There are relatively few scientific studies on managing knowledge with mobile healthcare information systems. Moreover, only a small number of articles provide knowledge about the actual use of mobile medical applications (Fischer et al., 2003). We will present a case study among the users of Duodecim mobile healthcare information system. The data was collected through the Internet among all of the 352 physicians (with the response rate of 66.5%, n=234), who were users the case system.

The article is organized as follows. Chapter II describes the background for the study. Chapter III presents the 7C model for knowledge creation and management, Chapter IV introduces the case system, Chapter V discusses the results, and finally Chapter VI concludes the article.

## **BACKGROUND**

Systematic processing of health-related data, information and knowledge focusing on the study of information processing principles and solutions in healthcare is referred to as *health informatics*, while the scientific discipline related to it is called medical informatics (Hasman et al., 1995). The terms are often used synonymously, even though some differences exist in their use between countries. For instance, medical informatics in Germany also includes nursing informatics and

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