



Knowledge management systems success in healthcare: Leadership matters



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ABSTRACT

Purpose: To deliver high-quality healthcare doctors need to access, interpret, and share appropriate and localised medical knowledge. Information technology is widely used to facilitate the management of this knowledge in healthcare organisations. The purpose of this study is to develop a knowledge management systems success model for healthcare organisations.

Method: A model was formulated by extending an existing generic knowledge management systems success model by including organisational and system factors relevant to healthcare. It was tested by using data obtained from 263 doctors working within two district health boards in New Zealand.

Results: Of the system factors, knowledge content quality was found to be particularly important for knowledge management systems success. Of the organisational factors, leadership was the most important, and more important than incentives.

Conclusion: Leadership promoted knowledge management systems success primarily by positively affecting knowledge content quality. Leadership also promoted knowledge management use for retrieval, which should lead to the use of that better quality knowledge by the doctors, ultimately resulting in better outcomes for patients.

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1. Introduction

Healthcare is a knowledge intensive industry. Medical knowledge is important for clinical decision-making and, ultimately, for delivering better outcomes for patients. The importance of medical knowledge has been highlighted in the ongoing initiatives to promote evidence-based medicine [1–3] and clinical quality improvement [4–6]. Increasingly, healthcare professionals rely on information technology tools to cope with the ever increasing need to manage knowledge [7–11]. Such tools are not limited to specialist knowledge management software but include common tools such as intranets and email [11].

The purpose of the present study is to establish the determinants of success of knowledge management systems in healthcare. To achieve this, we develop a model incorporating system and organisational factors. System factors characterise information technology and its perceptions by the users, and organisational

factors describe the organisational context of its use. We do not focus on the use of any particular type of information technology for managing knowledge, such as expert systems or clinical decision support systems. Moreover, we do not limit our consideration to discrete systems explicitly implemented and labelled as “knowledge management systems”. Rather, we consider any use of information technology for managing knowledge within an organisation, including commonly available tools such as email, video conferencing, or intranets, as the use of a knowledge management system. This conceptualisation of knowledge management systems is consistent with the Davis's definition of an information system as a social system that uses information technology [12] and has been used in the books by Dalkir [13] and Hislop [14] and in empirical studies [15,16]. It reflects the recent trend (highlighted by Palacios-Marqués [17]) of organisations shifting from relying on proprietary technology developed top-down to encouraging end-users to take a direct role in shaping how information technology is used for knowledge management, using commonly available tools such as social networking software.

The research on health information systems success is well established [18–25]. However, none of the prior studies considered the effects of organisational factors on knowledge management systems success in healthcare organisations.

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To develop the model, we adapt and extend the generic knowledge management systems success model by Wu and Wang [26] by including organisational and system factors relevant to healthcare. (The model by Wu and Wang is based on the well-known DeLone and McLean's conceptual framework [27].) We test our model using empirical data obtained in a cross-sectional survey of doctors working within district health boards serving two mid-size cities in New Zealand.

The paper is structured as follows. First, we review the existing knowledge management systems success models. Then, we introduce the hypotheses, introduce the research methodology, and describe the approach to data collection. Finally, we interpret the results of model testing, discuss their implications, and draw conclusions.

2. Literature review

2.1. Health information systems success

There are many studies of factors that influence the success of information systems, as reviewed by Petter et al. [28]. In particular, there are many studies of information systems success at healthcare organisations [18–25].

The well-established DeLone and McLean information systems success model [27,29–31] focuses on system factors. The model suggests that information system attributes, such as system quality and information quality, influence the users' perceptions of the system, which then influence their use of the system. The use of the system results in benefits for the users and for the organisation. The DeLone and McLean information systems success model has been used to explain operational support health information systems success [25] and as a framework for system evaluation [32,33].

2.2. Knowledge management systems success models

Wu and Wang [26] developed a generic knowledge management systems success model based on the DeLone and McLean [27] information systems success model. Wu and Wang tested their model using data collected from firms in Taiwan. Halawi, McCarthy, and Aronson [34] proposed a model very similar to that of Wu and Wang and tested it with data collected from knowledge-based organisations in the USA.

Kulkarni, Ravindran, and Freeze [35] extended the Wu and Wang [26] model by adding organisational factors: leadership, incentives, co-worker (perceived use of the system by co-workers), and supervisor (perceived use of the system by the respondent's supervisor). The model was tested with data collected in a survey of mid-level managers in the United States, and it was found that both organisational and information system factors affected knowledge use.

In the context of healthcare, Hwang et al. [36], adapted the DeLone and McLean information systems success model [27] to study knowledge management systems success (thus, the model included only system factors). They validated their model with data obtained in a survey of the users of a specialised knowledge management application for classifying diseases at a hospital in Taiwan.

2.3. Defining and measuring success

Halawi et al. [34] and Hwang et al. [36] included improvements in organisational productivity and efficiency as outcome variables in their models. In contrast, Wu and Wang [26] and Kulkarni et al. [35] limited their models to explaining knowledge management systems use and knowledge use. Even though improvements in productivity and efficiency are more directly related to organisational success than system use, the respondents' judgements of

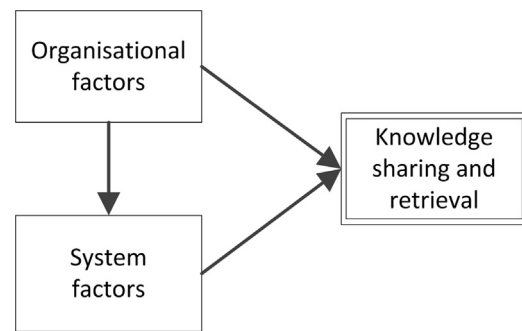


Fig. 1. The overall structure of the proposed knowledge management systems (KMS) success model for healthcare.

the magnitudes of such improvements may be considerably less accurate than their reports of observable behaviour [37].

Knowledge management systems use involves both knowledge sharing and knowledge retrieval, which are distinct behaviours. For example, Garud and Kumaraswamy [38] reported a longitudinal case study in which an increase in knowledge sharing resulted in a decrease in knowledge retrieval. The importance of distinguishing between the two behaviours has been emphasized in prior research [39]. Nonetheless, prior studies, such as those by Wu and Wang [26] and Kulkarni et al. [35], did not distinguish knowledge management systems use for sharing from use for retrieval.

3. Research model and hypotheses

The overall structure of the research model of the present study is given in Fig. 1, and the details are introduced in this section and presented in Fig. 2. The model extends the generic knowledge management systems success model by Wu and Wang's by adding organisational factors relevant to the healthcare context. It is hypothesised that organisational context (the influence of the leaders and organisational culture and norms) affects doctors' behaviour with respect to the use of the system both directly and indirectly via the system factors (system characteristics and doctor's perceptions of the systems).

The constructs included in the research model are listed and briefly defined in Table 1. In the following sections we introduce the individual hypotheses; first for the information systems factors and then for the organisational factors.

3.1. System factors

This section presents the hypotheses relating to the characteristics of the knowledge management systems (Knowledge Content Quality, KMS Quality), the perceptions of the users (Perceived Usefulness of KMS, User Satisfaction, and Perceived Security) and their use of the systems (KMS Use for Sharing, KMS Use for Retrieval). This part of the model is based on Wu and Wang's [26] adaptation of the DeLone and McLean model.

Knowledge management systems that provide access to higher quality knowledge are more likely to be perceived as useful and satisfactory [26,36]. High quality of knowledge content is particularly critical in healthcare because it affects doctors' decisions that may have serious implications for their patients' well-being [40].

H1: Higher knowledge content quality leads to higher perceived usefulness of knowledge management systems.

H2: Higher knowledge content quality leads to higher user satisfaction.

Knowledge management systems that are more reliable and responsive are more likely to be perceived as useful and satisfactory [26,35,36]. Doctors, who work under time and performance

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