

# Extending TAM to Measure the Adoption of E-Collaboration in Healthcare Arenas

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## INTRODUCTION

A number of developed countries are experiencing significant demographical changes as a result of an ageing population (Grumbach et al., 2002). In order to cope with this structural social change, radical improvements in the healthcare process are vital in order to gain more efficiency. The use of e-collaboration may be an excellent way to improve the service levels and efficiency in the healthcare domain. With regard to the adoption of information technology (IT) and information systems (IS), the healthcare sector has traditionally lagged behind other sectors but this is gradually changing (Wu, Wang, & Lin, 2005). The use of technology acceptance models (TAM) in order to explain the adoption of technology-based applications in the healthcare arena, however, is expected to lead to much better insights (Raitoharju, 2005). Both the acceptance of new technologies by healthcare professionals and the usefulness of explanatory models are therefore vital in order to explain the current lack of progress in the adoption of e-services. In this article we will review the currently available models with regard to the adoption, acceptance, and adaptation of e-collaboration services in the healthcare domain.

The goal of this article is to propose a new model based upon the conclusions of this review. We argue that there are no models available with sufficient explanatory power as network aspects, the role of recipients, and cross-border issues are not sufficiently taken into account. We propose therefore a number of guidelines for a new process-like model that should incorporate insights from previous models. Rather than viewing technology adoption as a single static snapshot, the new model should encompass a more continuous evaluation of the adoption process and should evaluate the service continuously throughout several phases in time. In order to address these issues, we developed a

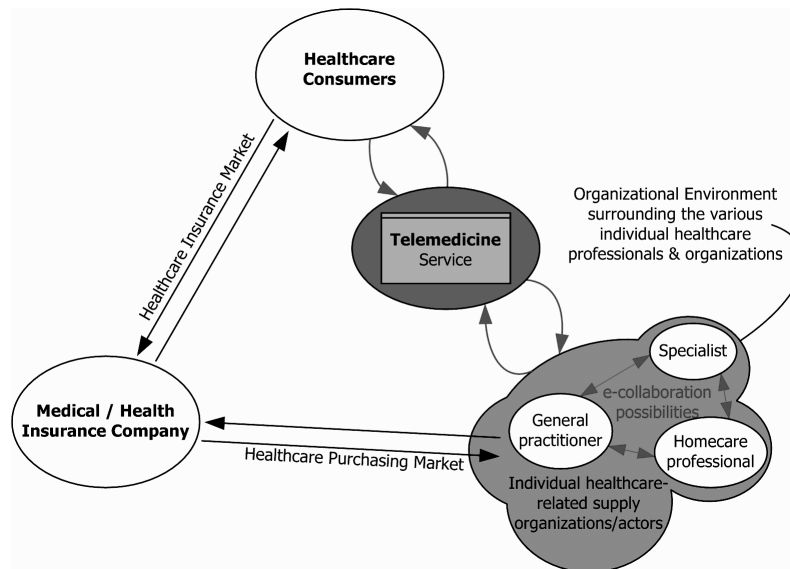
new holistic model that we hope, solves the points of attention named above.

## BACKGROUND

The acceptance of e-collaboration services in healthcare is not directly comparable to the acceptance of these services in other sectors. Healthcare supply often takes place in broader networks of care-related actors, which increases the interdependency of organizations, and which makes the diffusion and adoption of new technology even more complicated (Andriessen, 2003). This is supported by Hu, Chau, and Sheng (2002), who state it is typical for telemedicine services to span organizational boundaries. As a result of this inter-organizational nature, Hu et al. (2002) remark that technology adoption investigations must include multiple organizations simultaneously. The essential characteristics of users and technologies in the context of professional healthcare differ greatly from those in customary commercial context (Wu, Wang, & Lin, 2005).

Succi and Walter (1999) provide some examples of typical differences between physicians and managers. Medical professionals constitute a separate community as a result of their specific knowledge and their achieved professional status associated with special power and prestige. A second difference is the large professional autonomy of healthcare professionals in comparison to business professionals. Since outsiders do not have the knowledge to evaluate the practices, professionals have to protect themselves against incompetence, carelessness and exploitation. Healthcare professionals, therefore, proclaim that they themselves are in the best position to operate, control, and also to regulate their own practices (Succi & Walter, 1999).

Figure 1. Interrelations of various healthcare related actors within a healthcare environment



For the healthcare professionals in the hospital and homecare, Raitoharju (2005) concludes that more time spent with IT means less time spent with the patients which is not very popular among care personnel. This again shows the importance of paying adequate attention to the process of technology acceptance when introducing e-collaboration services in healthcare settings. In this paper we focus in particular on the group of causality oriented models based upon Davis' technology acceptance model (TAM) (Davis, 1993), because of the availability of literature with regard to healthcare-related studies of TAM.

## TECHNOLOGY ACCEPTANCE MODEL AND EXTENDED TAM

The original technology acceptance model (Davis, 1989) as well as its extensions explain and predict the eventual use pattern of new (software) technology by end-users. TAM was extended in order to take relevant determinants of perceived usefulness into account (Venkatesh & Davis, 2000). Figure 2 shows TAM as well as the integrated extended TAM.

Various studies have shown that when using the extended TAM in a healthcare sector, only the perceived usefulness plays an important role and the perceived ease of use is negligible (Chau & Hu, 2002; Chismar & Wiley-Patton, 2002; Hu et al., 1999). Jayasuriya

(1998) also concluded that the most important factors with respect to the acceptance of PC-usage among healthcare professionals (mainly nurses in this study) are the perceived usefulness in combination with their knowledge and expertise of a PC.

Hu, Chau, Sheng, and Tam (1999) examined TAM using physicians' acceptance of technology. In their conclusion they state that in order to foster individual intentions to use a technology, it is important to try and achieve a positive attitude towards using the technology. This means that a positive perception of the technology's usefulness is crucial, while the ease of use of the technology itself may be less important for physicians.

According to Raitoharju, "the TAM-model has many useful points but it is not ideal when evaluating the healthcare sector (and) the use of IT is not necessarily a convenient goal when measuring user acceptance" (2005, p. 4). Another important characteristic which is not taken into account in TAM is that the supply of healthcare and homecare takes place especially in broader networks of care-related actors. This implies that the interdependency of organizations is increased by interorganizational diffusion and adoption processes (Andriessen, 2003).

Venkatesh and Davis (2000) conclude that because of the increasing trend of organizations changing from hierarchical command-and-control structures towards more network-structures of autonomous teams, the

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