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Understanding physicians' acceptance of the Medline system for practicing evidence-based medicine: A decomposed TPB model

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ABSTRACT

Purpose: Evidence-based medicine (EBM) supports physicians in their improvement of clinical quality and enhances hospitals' improvement of patient safety. Many health care institutions implement information systems to support physicians practicing EBM. However, studies exploring the antecedent factors of physicians' usage intention of information systems facilitating EBM practice are rare. Hence this study proposed a research model based on the decomposed theory of the planned behavior model (decomposed TPB) to investigate the factors influencing physicians' acceptance of the Medline system.
Methods: A field survey was conducted in Taiwan to collect data from physicians with experience in using the Medline system. A valid sample of 224 physicians was collected for data analysis. Structural equation modeling using the partial least squares (PLS) method with bootstrap estimate was used to test the research model.
Results: The findings of this study show that a physician's usage intention is significantly influenced by three factors, i.e. attitude, the subjective norm, and perceived behavior control. Furthermore, these three factors can be predicted by perceived usefulness and perceived ease of use, interpersonal influence, personal innovativeness in IT and self-efficacy, respectively.
Conclusions: The results of this study indicate that our research model provides an effective prediction of the intention of physicians to use the Medline system and provides valuable implications for academics and practitioners.

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1. Introduction

Health care is not only a kind of service, but also a lifesaving mechanism. Physicians are constantly relied upon to treat the diseases and health emergencies of individuals. Hence, how to improve clinical quality is a critical task for hospital organizations. Hospital organizations have adopted a wide variety of solutions to improve clinical quality. For example, some health care organizations have implemented information technologies, such as clinical decision support systems [1], to aid clinical decision-making. In addition, increasing numbers of

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health care organizations have implemented evidence-based medicine (EBM) to use as the current best evidence for making decisions about the care of individual patients. EBM is "*the process of systematically finding, appraising, and using contemporaneous research findings as the basis for clinical decisions* [2]" and is expected to improve clinical quality [3]. One of the steps for practicing EBM is searching the best evidence. The traditional channels used by physicians to collect external clinical evidence for performing EBM are textbooks, medical magazines, colleagues, and other literature, all of which are inefficient. However, with the development of the Internet, online medicine database systems are able to enhance the efficiency of evidence collection by giving decision-makers fast and efficient access to up-to-date knowledge at the right time and in the right format [4]. This study focuses on the usage intention with respect to the Medline system, a biomedical research literature database. We argue that physicians' usage intention with regard to this system will dominate his/her usage behavior of it, which, in turn, will support EBM practice. In other words, we assume that enhancing physicians' usage intention with regard to Medline system will improve the efficiency of searching best evidence when they are practicing EBM. Hence, the purpose of this study is to explore the factors that may influence physicians' acceptance of the Medline system.

Evidence-based medicine is a scientific methodology that employs the technique of sifting reliable information from large medical databases using epidemiological or statistical methods. EBM supports physicians in their improvement of clinical quality and enhances hospitals' improvement of patient safety. With the advancement and dissemination of EBM, hospital leaders and clinicians have recently paid serious attention to it [3]. In addition, some information systems have been provided to support EBM implementation, such as The Cochrane Library and Medline. The information system for practicing EBM in particular not only requires physicians to evaluate evidence and apply this to medical practice [5], but also requires them to use and operate this innovative information system. However, there are many factors that may influence their usage of it. For example, physician resistance is a problem when new clinical information systems are implemented [6]. Therefore, how to encourage them to use the system is an urgent and important issue. However, despite the urgency, studies exploring the antecedent factors of their usage intention are rare. The purpose of this study then, is to clarify these antecedent factors from the perspective of information system adoption. Hence, an empirical study was conducted to understand physicians' acceptance of the Medline system for practicing evidence-based medicine.

2. Background

The adoption and use of information technology among health institution personnel has been an important issue in the field of medical informatics. Previous studies have investigated the factors influencing information technology acceptance by physicians or nursing personnel via several information technologies, such as the microcomputer [7], bedside-computer technology [8], telemedicine technology [9–11], clinical decision support systems (CDSS) [12], personal digital assistance (PDA) [13], the electronic logistics information system [14], electronic medical records (EMR), computerized provider order entry (CPOE) [15], and health IT adoption in community health centers [16]. Compared with the previous studies mentioned above, this study highlights one specific question: what are the factors driving physicians' usage intention of the Medline system? This paper argues that understanding the usage of the system is important because it supports physicians in searching the best evidence with which to answer the questions about prevention, diagnosis, prognosis, therapy, causation, etc. The Medline system is an online database system for biomedical information. The features of it differ from those of other medical technologies investigated by previous studies. For example, telemedicine, which is an application of clinical medicine, delivers remote medical consulting or examinations via interactive communication technologies. PDA is a kind of information communication technology used by medical workers in outpatient clinics and hospital settings. Hence, it is important and valuable to understand physicians' acceptance behavior of the Medline system.

2.1. *EBM and the Medline system*

The purpose of practicing EBM is to improve the care delivered to patients [17]. EBM was defined as "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research [18]". The traditional channels used by physicians to collect external clinical evidence for performing EBM are textbooks, medical magazines, colleagues, and other literature. These channels have two shortcomings. First, periodic medical publications are laggard in updating EBM; therefore, it is difficult to find the latest clinical reports or scientific literature. Second, a manual search is an inefficient approach that limits the performance of physicians. However, with the development of the Internet, these shortcomings are overcome by online medical database systems. For example, Evidence-Based Medicine Reviews (EBMR) is a type of database for medicine reviews comprising several online databases, including ACP Journal Club, Evidence-Based Medicine, the Cochrane Database of Systematic Reviews, the Abstracts of Reviews of Effectiveness Database, and the Cochrane Central Register of Controlled Trials. Physicians not only use online medical database systems for searching through medical knowledge easily and efficiently, but also to obtain data irrespective of time or place [19]. This study focuses on the Medline system.

2.2. *Information technology acceptance models*

Medline is a type of medical information system (IS). The main issue for IS adoption research is to indicate the key factors that influence the actual-use behaviors of users. Since the behavior of an individual is directly affected by her/his intention [20], such intention models have been extensively adopted to predict this actual behavior [21–23]. Therefore, the question as to how user intention can be predicted has been a popular

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