



# An investigation of the effects of cultural differences on physicians' perceptions of information technology acceptance as they relate to knowledge management systems



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## ARTICLE INFO

### Article history:

Available online 26 June 2014

### Keywords:

Knowledge management systems  
Cultural differences  
Technology acceptance model  
Healthcare organizations

## ABSTRACT

The purpose of this study is to explore the impact of national cultural differences on physicians' perceptions of knowledge management systems acceptance. Data is collected from 106 physicians in the United States and 255 physicians in Taiwan who agreed to participate in the investigation, and a *t*-test is used to compare the path coefficients for each moderator. Cultural differences were found to impact knowledge management system acceptance. The results reveal that individualism/collectivism, power distance, and high-context/low-context cultural characteristics account for the significant differences between the U.S. and Taiwan in this regard. Theoretical issues related to technology acceptance which lay beyond the scope of this investigation and other issues related to cultural differences may have had an impact on the research findings. This study can assist in the management of healthcare organizations by adding to the knowledge regarding the acceptance and development of management systems. The findings provide insight into the cultural differences which influence physicians' perceptions about knowledge management systems acceptance, and have implications for improving the knowledge relating to management systems acceptance in healthcare organizations.

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## 1. Introduction

In the digital age, healthcare organizations must more than ever be able to utilize information systems to enhance efficiencies, coordination, communication, and decision-support, and get timely answers to questions (Ortega Egea & González, 2011), when they arise in daily clinical and administrative practice, to ensure patient safety. Healthcare organizational characteristics are typical of a knowledge based industry, with this knowledge being concentrated in the hands of practitioners and administrators working in healthcare providing environments. Therefore, a healthcare organization's ability to enjoy competitive advantages will be increasingly dependent on its effective management of knowledge (Magnie-Watanabe & Senoo, 2010). Knowledge management is adopted to improve the performance of operation processes and problem solving. Knowledge management systems are technology based, and can be broadly defined as technology systems that improve and enable knowledge storage, generation, codification, and

transfer (Chen, Sun, & McQueen, 2010; Matayoung & Mahmood, 2013; Zhen, Wang, & Li, 2013). Knowledge management systems can be broken down into two main categories. The first comprises decision support technologies; these are tools that can be used to support the existing organizational knowledge, and can be applied whenever required to help decision makers in determining the right approach. These technologies include data mining capabilities, simulators, online analytical processing, and so forth. The second type is made up of workgroup support systems. These are general systems that help groups of knowledge workers perform their jobs better, for example electronic mail and messaging, project management, document repositories, expert directories, desktop video conferencing, on-line catalogs of library material, and workflow tools (Gunnlaugsdottir, 2003).

Although the diffusion and use of technology has little regard for national boundaries, previous researchers have suggested that behavioral models do not universally hold in different cultures (Hofstede, 1980; Keil et al., 2000; Lewis & George, 2008; Srite & Karahanna, 2006). Moreover, cultural differences between countries influence the effectiveness and efficiency of information technology acceptance and deployment (Kambayashi & Scarbrough, 2001; Srite & Karahanna, 2006). On a micro-level, we can conceptualize

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physician's attitudes and behaviors as workers (Hoff, 2001). Their jobs involve developing or using knowledge in the provision of healthcare service. Their jobs also require them to routinely engage in negotiating and decision making with their professional teams across a variety of work situations. Empirical observations made by Martinsons and Davison (2007) suggest a strong relationship exists between successful knowledge management and information system acceptance. We are still taking about Martinsons et al. (2007) cultural differences between countries has a critical impact on how well information technology applications are adapted by the decision making approaches of their user. Thus, this study attempts to understand how national cultures may influence individual-level acceptance behaviors by looking at physicians' perceptions of knowledge management systems acceptance.

Cultural differences are assigned to individuals based on their nationality (Wallace, Reid, Clinciu, & Kang, 2012); although national culture is dependent on many macro-level phenomena, the acceptance of information technology by end-users is ultimately an individual-level concern. It is recognized, however, that macro-level variables often have an influence on individual user behavior, as micro-level phenomena are usually embedded in macro environments (Park & Lee, 2011). In addition to, to avoid the problem of ecological fallacy (Srite & Karahanna, 2006), this research design adopts a perspective based on cultural psychology and psychological anthropology to assesses cultural features as manifested by personal cultural differences which are analyzed at the individual-level. This research argues that individuals hold national cultural values to differing degrees. Hence, this study treats national cultural differences as a individual difference variable on behavior, much like masculinity/femininity, individualism/collectivism, high context /low context, power distance, and uncertainty avoidance, all of which can be incorporated into an extended model of technology acceptance and looked at as moderators of critical relationships in healthcare.

Our understanding of how culture impacts technology acceptance is limited. The existing body of literature contains studies on technology acceptance models (TAMs) or on TAM-related studies in the field of information technology acceptance and practice; there has been very little cross-cultural research, however, in relation to this phenomenon. In the field of healthcare information management, Demeester (1999) examined information technologies implementation in the European Union, and found evidence that cultural preferences, differences, and norms guide individuals when they engage in decision-making processes and influence their determinations. Although this study provides evidence to shed light on technology acceptance across different cultures, it cannot predict individual behavior, since doing so would assume that: (1) all individuals in a given country share cultural preferences, differences, and norms to the same degree, (2) all individuals live and work in similar environments; and (3) the influence of national culture is uniform across all individuals in a specific healthcare work-place.

In this study, the dimensions of national culture differences is viewed in terms of individual difference variables that are hypothesized to moderate relationships in this model of knowledge management systems acceptance in healthcare organizations. The main research questions revolve around how factors in the research model differed most significantly across cultures, and what the implications of those differences are.

## 2. Theoretical background

In this section, this study reviews the literature on national cultural differences and information technology acceptance to establish the basis for the theoretical model and the hypotheses.

### 2.1. National cultural differences

Hofstede (1980) defined culture as the collective programming of the mind that distinguishes the members of one group or category of people from another. National cultural reflects national patterns in the set of norms, behaviors, beliefs and customs that exist within the population of a sovereign nation (Bagchi, Cerveny, Hart, & Peterson, 2003; Shore & Vankatachalam, 1996; Peltokorpi, 2006). In other words, national culture can be seen as a value system and a sense of pride associated with a nation, even though individuals will vary in their personal attitudes and behaviors toward these common cultural experiences. It is well accepted that cultural forces have the power to shape the attitudes and behavior of individuals.

Hofstede (1980) also suggests four broad sets of dimensions by which to characterize culture differences: (1) Masculinity/Femininity refers to characteristics of psychological gender. Masculinity can include work orientation, assertiveness, considerations of what is typical of or appropriate to gaining material success, and competitiveness. Notions of femininity, in contrast, generally reflect traits which revolve around quality of life, gentleness, empathy, graciousness, tact, and sensitivity (Hofstede & et al., 1998). (2) Individualism/Collectivism; individualism is a social psychological phenomenon that refers to the ways in which people identify themselves and focus on their goals as singular units, rather than seeing themselves as members of a group (Hofstede, 1993). In other words, individualism can be seen as the diametric opposite of collectivism. Collectivism is defined as the situation in which other people's perceptions or one's social orientation with respect to the group override considerations of individual gain (Sun & Zhang, 2006). (3) Power distance is an important cultural concept by which to distinguish people's behavior in relation to technology acceptance. According to Hofstede's (1984) definition, it is a measure of the degree to which human inequality is seen as normal, as reflected in the attitudes of a culture. (4) Uncertainty avoidance is defined as the degree to which individuals in a specific culture tolerate risk and feel threatened by uncertain situations, which influences and is influenced by the formal rules and organizational structures, found in communities, as well as relationships (Hofstede, 1984). Western countries and Eastern countries have differences in terms of national culture, race, religion, and language. Moreover, according to Hofstede's (1980) conclusions, Western cultures are based on femininity, moderate individualism, low power distance, and weak uncertainty avoidance. In contrast, Eastern cultures are characterized by masculinity, collectivism, moderate power distance, and strong uncertainty avoidance. It is clear that national cultures are important elements which influence individual practices and attitudes. In the field of information technology, for example, Martinsons and Davison (2003) conducted an empirical study in which they compared information technology acceptance in several countries. In their conclusions, they attributed the adoption differences they documented to variances between cultures.

In addition to the foregoing, this study considers whether the high-context/low-context cultural dichotomy may impact information technology acceptance by framing the analysis at the national cultural level. The converse terms high-context culture and low-context culture were first presented by Hall (1976). In Western cultures, communication tends to take place predominantly through explicit statements in text and speech, making them low-context cultures. On the other hand, in Eastern cultures, many messages are left unsaid, and meaning is conveyed instead through body language, and paraverbal cues (Hall, 1989; Ou, Sia, & Hui, 2013; Wörtz, 2006). According to the information richness theory (IRT), all information channels possess certain characteristics that make them more or less rich, and one main purpose of choosing a communication medium is to reduce the equivocality of a message (Daft,

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