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Impact of cultural factors on attitude toward using ERP systems in public hospitals

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ABSTRACT

The main problems that arise in adopting most enterprise resources planning (ERP) strategies come from organizational, rather than technical, issues, for example, social and cultural barriers, and user resistance. This paper analyzes the impact of cultural factors on user attitudes toward ERP use in public hospitals and identifying influencing factors. The theoretical grounding for this research is the Technology Acceptance Model (TAM). The proposed model has six constructs ("resistance to be controlled", "resistance to change", "perceived risks", "perceived usefulness", "perceived ease of use", and "attitude toward using"), and nine hypotheses have been generated from the connections between these six constructs. Results suggest important practical implications for attitude toward using ERP and to develop an understanding about how to improve this attitude in hospitals.

La influencia de los factores culturales sobre la actitud hacia el uso de sistemas ERP en hospitales públicos

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RESUMEN

La mayor parte de los problemas que surgen en la implantación de sistemas ERP tienen su origen en causas de tipo organizativo más que en causas técnicas, como por ejemplo, las barreras sociales o culturales y la resistencia por parte de los usuarios. Este trabajo analiza el impacto de factores culturales sobre la actitud hacia el uso de sistemas ERP en un hospital público. El marco teórico empleado es el modelo de aceptación tecnológica (TAM). El modelo propuesto consta de seis constructos ("resistencia a ser controlado", "resistencia al cambio", "riesgo percibido", "facilidad de uso percibida", "rendimiento percibido", y "actitud hacia el uso") y nueve hipótesis, que han sido generadas a partir de las conexiones entre los constructos. Los resultados sugieren importantes implicaciones prácticas respecto a la actitud hacia el uso de sistemas ERP y cómo mejorar este actitud en los hospitales.

1. Introduction

During the last decades health care managers tried to maximize hospitals' efficiency, without reducing the quality of health care services provided to the patients (Calzado, García, Laffarga, & Larrán, 1998; Escobar, Escobar, & Monge, 2014; Herwartz & Strumann, 2014; Pizzini, 2006). This imperative has been reinforced in recent years as a consequence of the lack of available public resources for meeting the ever-increasing demand for health care services.

Hospital information systems are usually heterogeneous and autonomous (Koumbati, Temistocleous, & Irani, 2006). However, to improve the efficiency of the hospital sector, it has been proposed that integrated management systems should be applied in

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these health care organizations. These integrated systems would help to improve hospital' processes and reduce operating costs (AECA, 2014; Alshawi, Themistocleous, & Almadani, 2004; Berchet & Habchi, 2005; Kansal, 2006; Van Merode, Groothuis, & Hasman, 2004).

The behavior of health care personnel in relation to the management of information is directly related to their status as primarily clinical rather than administrative personnel. The clinical personnel constitute a power group that, informally, exerts considerable influence in the management decisions taken within the hospital (Bloom, 1991; Soh & Sia, 2004). As a consequence of the power structure existing in hospitals, information is usually fragmented between clinical and non-clinical topics or areas, which can make the use of integrated management systems difficult or impossible.

The control of information is sometimes used to legitimize and maintain the structures of power existing in an organization (Escobar, Escobar, & Monge, 2010). To prevent this phenomenon, information systems can be employed to redistribute power among the different members of the organization (Abernethy & Vagnoni, 2004). The implementation of new information systems in a hospital represents a possible vehicle for the transformation of a "de facto" power structure into a different, more formal kind of power structure, by involving all the personnel, clinical and non-clinical, in the functions of management and supervision of the diverse activities of the hospital (Ribeiro & Scapens, 2006; Scapens & Jazayeri, 2003).

However, it must be recognized that the introduction of new information systems in a hospital has a direct impact on the behavior of the clinical personnel in relation to the acceptance of information technologies (Koumbati et al., 2006; Mc Ginnis, Pumphrey, Trimmer, & Wiggins, 2004; Pizzini, 2006). In this context, Soh and Sia (2004) emphasized the influence that power groups exert over the implementation of information systems. Thus, sometimes non-compatible software packages are implemented in specific hospital contexts (Escobar et al., 2010).

There are two main approaches for integrating information in hospitals: complete and partial (Stefanou & Revanoglou, 2006). The complete approach is based on a single integrated module program encompassing clinical, administration, and financial data using different applications, such as patient sign-in and discharge information, the locations of first aid kits, invoicing and pharmacy data, etc. Anderson (1997) considers that personnel reject these integration systems, as they are normally reluctant to change their work routines, and feel that closer supervision might be problematical. Organizational routines that reflect institutionalized practices are slow to change and such changes often face resistance (Granlund & Malmi, 2002). Soh and Sia (2004) argues that this approach to implementing ERPs is not valid for hospitals. Conversely, management consider this integration approach to be efficient, and that its cost is offset by its benefits (Stefanou, 2001). Partial integration involves using the ERP's administrative and financial modules and connecting them via a series of specific applications (radiology, laboratory, etc.).

The current trend in the health care sector is to implement management strategies focused on improving efficiency in hospitals. It has been argued that ERP is the most suitable type of information system for supporting the management of organizations like hospitals (Escobar et al., 2010; Van Merode et al., 2004). Initially, processes of "partial integration" are being carried out, using the administrative and financial modules of ERP, and keeping specific applications for other areas. As a general rule, ERPs have been employed to facilitate integration among all functional areas within a company organization (Alshawi et al., 2004; Davenport, 1998; Kansal, 2006; Klaus, Rosemann, & Gable, 2000; Muscatello, Small, & Chen, 2003). In the case of hospitals, they are being used to achieve, as a minimum, the integration of planning within the financial area. ERPs have been developed in response to the need to manage across global businesses, a difficult task made more so in organizations such as hospitals, where each unit business is using different systems and technologies (Imra, Murphy, & Simon, 2000).

It is not easy to deal with this integration process in hospitals because of their organizational issues. The major problems arise in most ERP adoptions because of organizational rather than technical issues, for example social and cultural barriers, and user resistance (Pan, Newell, Huang, & Galliers, 2007). In hospitals, ERP systems are welcomed as long as they provided direct benefit to their work and eased their work practices (Escobar et al., 2010; Nicolaou, 2004). At the same time, hostile reactions toward the ERP system were evident since it implied control mechanisms of their work and introduced new work tasks previously performed by others (Jensen & Aanestad, 2007). These hostile reactions could be strong in Spanish public hospitals. In Spanish public hospitals, health care personnel are public servants with permanent contracts, so it is very important to analyze their attitude toward using new technologies because they are in a very strong position to hinder new systems and process re-engineering.

The aim of previous research was focused on exploring critical factors related to success and failure of the ERP implementation process (Berchet & Habchi, 2005; Bingi, Sharma, & Godla, 1999; Finney & Corbett, 2007; Muscatello et al., 2003; Nah, Lau, & Kuang, 2001; Santamaría-Sánchez, Núñez-Nickel, & Gago-Rodríguez, 2010). However, a deeper knowledge of factors related with attitude toward using ERP systems in hospitals is required. The main objective of this paper is to analyze the impact of cultural factors on the attitude toward using ERP systems in public hospitals identifying influencing factors. Cultural factors that have been included in this paper refer to organizational culture. Organizational culture can be defined as the general pattern of mindsets, beliefs and values that members of the organization share in common, and which shape the behaviors, practices and other artifacts of the organization which are easily observable (Prajogo & McDermott, 2005; Sathe, 1985; Schein, 1985). Understanding these factors provides the opportunity to explore which actions might be carried out to boost adoption by potential users.

Technology Acceptance Model (TAM) (Davis, 1989, 1993) is generally used to analyze individuals' acceptance of new technologies (Cornell, Eining, & Hu, 2011; Dasgupta, Granger, & McGarry, 2002) and has become established as a robust, powerful and parsimonious model for predicting attitude toward usage (Hu, Chau, Sheng, & Tam, 1999; Venkatesh & Davis, 2000). Apart from the aforementioned aims, our analysis will validate TAM in the context of Spanish public hospitals while also identifying new external variables which affect the constructs of "perceived usefulness", "perceived ease of use", and "attitude toward using".

The remainder of the paper proceeds as follows: in the next section, we provide a theoretical background and posit the hypotheses; we then describe our research methodology and present data analysis and results; and we then conclude, discussing implications for future research.

2. Background

2.1. Technology Acceptance Model

TAM specifies the causal relationships between systems design features, "perceived usefulness", "perceived ease of use" and "attitude toward using" (Davis, 1993). The basic premise of this model is that the more accepting users are of new systems, the more they are willing to make changes in their practices and use their time and effort to actually start using the system (Jones, McCarthy, & Halawi, 2010).