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R17. A Pilot Study of IOKSS in the Health Sector

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Abstract

This pilot study aims to assess the predictors of knowledge workers' attitudes toward the inter-organizational knowledge sharing system (IOKSS) in the health sector. The deployment of IOKSS in knowledge-intensive sectors can be valuable and crucial for effective social and economic development, especially in developing countries. Knowledge workers' attitudes toward IOKSS are critical, as they are the driving force of such systems; however, prior research on inter-organizational systems (IOS) has focused on organizational adoption, and mainly on vertically-linked organizations. Based on preliminary data collected from medical doctors in various organizations in the health sector, this study indicated that several factors related to individuals, peers, proposed IOKSS, the organization, and sector were significantly correlated with knowledge workers' attitudes. Such results can provide several insights for researchers and practitioners on their adoption of IOKSS.

Keywords

Knowledge Workers, Inter-organizational System, Inter-organizational Knowledge Sharing System, Pilot Study

1. Introduction

An inter-organizational KSS (IOKSS) is a type of knowledge management systems (KMS), and is defined here as a system that enables seamless dissemination of individual and organizational knowledge (through repositories or networking) between two or more organizations. Medical doctors, for instance, can share knowledge through a health IOKSS by either codifying it in the system, or communicating the knowledge with their peers through the system (e.g., using video-conferencing). An IOKSS is one type of inter-organizational system (IOS) which was coined originally by Cash and Konsynski (1985). Several operational, strategic, and social benefits might result from IOS deployment for the participating organizations (Robey et al., 2008), the government, and society. Developing nations can benefit from new technologies and applications, such as IOKSS, for knowledge management. The exchange of inter-organizational information integration is a key enabler for digital government (Pardo & Tayi, 2007), and vital for the social and economic development of any country and the welfare of society, such as in health and education sectors.

IOKSS can be deployed for vertically-linked organizations, such as in the supply chain (suppliers, organizations, customers, etc.), and/or for horizontally-linked organizations (those that operate on the same business level). Most prior empirical studies have investigated IOS deployment in vertically-linked organizations (Reich & Benbasat, 1990; Ranganathan et al., 2011). However, a few studies (e.g., Pardo et al. (2006); Dawes et al. (2009); Yang & Maxwell (2011)) address IOS adoption for horizontally-linked organizations. Linking rivals through IOKSS can be more challenging than linking organizations in vertical linkage because of competition and rivalry, especially if it involves private organizations. According to Choudhury (1997), organizations that are horizontally-linked can develop IOS cooperatively for strategic alliance or/and public good.

Adoption of any system can be assessed based on organizational or end-users' adoption. Prior research on IOS reported empirical studies mainly focused on organizational adoption (Robey et al., 2008). However, very limited studies have assessed IOKSS adoption by knowledge workers who are the end-users and the key stakeholders in any knowledge management initiative. Accordingly, this study aims to investigate the key success factors to knowledge workers' attitude toward the development of IOKSS among horizontally-linked organizations in the health sector in a nation. An earlier theoretical paper by the author developed a list of factors that could impact knowledge workers' attitudes toward IOKSS (Al-Busaidi, 2013). This manuscript aims to further provide empirical insights based on data collected from medical doctors in the health sector. The health sector is an area of social and economic interest in several countries and IOS are crucial for health care and can play a strategic role in health care (Liau et al., 2010).

2. Predictors of Knowledge Workers' Attitudes toward IOKSS

2.1 Knowledge Workers

Numerous individual factors may be linked to knowledge workers' adoption of IOKSS. These factors can be related to their self-efficacy, personal innovativeness, knowledge self-efficacy, image, and knowledge ownership perception. Self-efficacy impacts knowledge contributors' usage of the KMS (Kankanhalli et al., 2005). Personal innovativeness impacts individuals' adoption of KMS (Xu & Quaddus, 2007). Knowledge self-efficacy is significant to knowledge contributors' usage of KMS (Kankanhalli et al., 2005). Individuals' perceptions of knowledge as power may impact knowledge-sharing behavior (Wang & Noe, 2010). Image and social identity can be another important social factor (Yang & Maxwell, 2011).

2.2 Peers

Peers' characteristics, such as trustworthiness, interactivity, and attitude, also may be linked to knowledge workers' attitudes toward IOKSS. Trust is an important factor in knowledge externalization (Lee & Choi, 2003), and IOS adoption (Lee & Lim, 2005). Peers' existing inter-organizational communications and network impacts intra- and inter-organizational information sharing (Yang & Maxwell, 2011). Peers' attitudes may impact individuals' intentions to share knowledge (Bock et al., 2005).

2.3 Perceived IOKSS

Perceived IOKSS characteristics (system's ease of use, usefulness, compatibility, and security) may be also linked to knowledge workers' attitudes toward IOKSS. Perceived ease of use affects users' acceptance of KMS (Xu & Quaddus, 2007), and IOS implementation (Yang & Maxwell,

2011). Perceived usefulness was a significant factor on professionals' attitudes toward knowledge sharing (Hung et al., 2010), and can be a critical factor to IOS implementation (Yang & Maxwell, 2011). Perceived compatibility is an important characteristic of KMS to end users' adoption (Xu & Quaddus, 2007), and IOS adoption and diffusion (Robey et al., 2008). Perceived security can be critical in IOKSS, as confirmed by several KM researchers (Jennex & Zyngier, 2007), and IOS researchers (Yang & Maxwell, 2011).

2.4 Organization

Organization factors, such as organization culture, organization structure, and technology competence, also can be linked to knowledge workers' attitudes toward IOKSS. An organization's knowledge culture is critical for KMS (Gold et al., 2001), and consequently, can change employees' attitudes. Also, creating a flexible organizational structure that endorses knowledge is crucial across the organization's boundaries (Gold et al., 2001). Furthermore, technological infrastructure that supports the communication of various types of knowledge is fundamental for building a firms' knowledge infrastructure capability (Gold et al., 2001) and the development of IOS (Lin, 2006; Robey et al., 2008; Yang & Maxwell, 2011).

2.5 Sector

Sector characteristics, such as regulations, standardization level and homogeneity of organizational IS-platforms in different organizations in the sector, can be associated with knowledge workers' attitudes toward IOKSS. Sector regulations and policies may hinder the adoption of IOS and knowledge workers' attitudes because the government may prohibit sharing sensitive and regulated information in domains and sectors related to public safety and national security (Pardo et al., 2006). Also, having standardized business processes and shared understanding among firms can be critical. Different operational procedures, workflows, and control mechanisms can negatively impact inter-organizational information sharing (Yang & Maxwell, 2011). In addition, heterogeneous information systems with different platforms (hardware and software) and data standards can challenge IOS adoption (Pardo et al., 2006; Yang & Maxwell, 2011).

3 Methodology

Data was collected from medical doctors (knowledge workers) in large hospitals in Oman, as small and medium hospitals have very limited applications. The questionnaire was randomly distributed to medical doctors. As research is still in progress, only 36 questionnaires (only 12% of the distributed questionnaires) have completed responses to these study indicators. Most hospitals and medical centers, including the participating organizations, are utilizing health information systems for managing their information and knowledge sharing system. Inter-organizational systems are currently proposed, especially for those organizations in the public sector.

About 47% of the medical doctors were male, while 53% were female. About 36% of them were less than 40 years old. The majority of medical doctors (about 83%), in a response to a questionnaire question, indicated that they support the deployment of IOKSS in the health sector, about 11% indicated that they support its deployment only in the public health sector, 3% indicated that they support its deployment only in the private health sector, and 3% indicated that they do not support its deployment at all.

The questionnaire included several measures of the study's constructs, along with demographic questions (e.g., gender, age, degree, work experience, etc.). Construct measurement items were phrased according to a five-point Likert-type scale (1= strongly disagree; 2=disagree; 3=neutral; 4= agree and 5=strongly agree). The construct indicators were adopted from previous studies in KM and IOS literature, as indicated in Table 1.

4. Data Analysis & Results

4.1 Constructs Validity, Reliability, and Significance

PLS-Graph 3.0 software was used for data analysis. As indicated in Table 1, constructs' reliability and validity (average variance extracted [AVE]) were above the recommended levels. Since this study is still in progress and the sample size is not sufficient to run a multi-variant analysis, a single regression was conducted to assess each construct association with knowledge workers' attitudes independently. The significance of the model paths was assessed based on their t-values, as indicated by Chin (1998). Table 1 shows that the constructs that were significantly associated with knowledge workers' attitudes toward IOKSS were, in order, knowledge power perception($\beta = 0.5650$), peers' attitudes($\beta = 0.5250$), peers' trust ($\beta = 0.5000$), IOKSS perceived ease of use($\beta = 0.4440$), organization structure($\beta = 0.4400$), knowledge self-efficacy($\beta = 0.4250$), peers' interactivity($\beta = 0.3740$), personal innovativeness($\beta = 0.3490$), sector standardization($\beta = 0.3370$), technology self-efficacy($\beta = 0.3200$), and IOKSS perceived usefulness ($\beta = 0.3220$).

4.2 Discussion

The significance of knowledge workers' technology self-efficacy and personal innovativeness on their attitudes toward IOKSS illustrated the importance of their technical skills, as indicated by IT and KM researchers above. Such technical skills enable them to easily accept KM applications (Xu & Quaddus, 2007). Also, their knowledge skill is crucial to reduce their fear of sharing incorrect knowledge, as indicated by Kankanhalli et al. (2005), as well as their perception of knowledge as power (Wang & Noe, 2010). Surprisingly, this study found that knowledge workers' perceptions of knowledge as power is positively associated with their attitude toward IOKSS. This result can be related to the national culture or organizational culture of the participating medical doctors, especially if they trust that their peers give them credit for their shared knowledge. Trust is a decisive factor in knowledge externalization (Lee & Choi, 2003). In addition, the significance of peers' trust, attitudes, and interactivity levels indicated the influential role of peers on knowledge workers' attitudes, especially in an IOKSS context, to thrive with collaborative knowledge sharing. Not surprising is the significance of the system's characteristics, such as perceived ease of use and perceived usefulness, as they have been critical to the acceptance of information technology, in general (Venkatesh & Davis, 2000). Furthermore, organizational structure is vital in approving knowledge sharing across the organization's boundaries (Gold et al., 2001). Likewise, the sector's standardization of business processes, workflows, and others among its firms is crucial to inter-organizational information sharing (Yang & Maxwell, 2011). The inability to detect the significance of the other investigated factors does not undervalue their importance, but could be traced to the small sample size.

Construct	Indicators	Source*	Reliability	AVE	ATTITUDE (Beta; P-Value)
Technology Self Efficacy	3	Ball & Levy (2008)	0.803	0.584	0.3200; 0.05
Personal Innovativeness	2	Xu & Quaddus, 2007	0.878	0.782	0.3490;0.025
Image	3	Venkatesh & Davis 2000)	0.870	0.694	0.2850;n.s
Knowledge Self efficacy	2	Kankanhalli et al. (2005)	0.782	0.657	0.4250; 0.01
Knowledge Power	3	Wang & Noe2010	0.751	0.511	0.5650;0.001
Peers Trust	3	Kankanhalli et al. (2005)	0.692	0.446	0.5000;0.005
Peers Interactivity	3	Wang et al. (2012)	0.851	0.659	0.3740 ;0.025
Peers Attitude	2	Bock et al. (2005)	0.869	0.770	0.5250;0.001
IOKSS Perceived Ease of Use	3	Venkatesh & Davis (2000)	0.870	0.692	0.4440 ; 0.01
IOKSS Perceived Usefulness	4	Venkatesh & Davis (2000)	0.909	0.717	0.3220; 0.05
IOKSS Perceived Compatibility	3	Xu &Quaddus, 2007	0.890	0.731	0.1930;n.s.
IOKSS Perceived Security	3	Salisbury et al. (2001)	0.826	0.623	0.2810;n.s.
Organization Culture	3	Al-Busaidi (2005)	0.819	0.602	0.1910;n.s.
Organization Structure	3	Gold et al. (2001).	0.937	0.833	0.4400;0.01
Organization Technical Infrastructure	3	Gold et al. (2001).	0.956	0.879	0.1840; n.s.
Sector Regulation	3	Yang & Maxwell (2011)	0.815	0.602	0.2940; n.s.
Sector Standardization	2	Yang & Maxwell (2011)	0.875	0.779	0.3370;0.01
Sector IS Infrastructure	2	Yang & Maxwell (2011)	0.814	0.686	0.2530;n.s.
Attitude	3	Bock et al. (2005)	0.933	0.778	N/A

Note: n.s. = not significant; N/A = not applicable;
* Indicators were either adapted from the identified sources, or self-constructed based on these sources.

Table 1: Study's Constructs and Their Significance

5. Conclusions

Inter-organizational knowledge sharing systems (IOKSS) are very valuable and crucial for social and economic development. Based on preliminary data collected from medical doctors in several organizations in the health sector in Oman, this study found that several factors are associated with medical doctors' attitudes toward IOKSS in the health sector. These factors, in order, are knowledge power perception, peers' attitudes, peers' trust, IOKSS perceived ease of use, organization structure, knowledge self-efficacy, peers' interactivity, personal innovativeness, sector standardization, technology self-efficacy, and IOKSS perceived usefulness. Thus, knowledge workers' (specifically medical doctors) attitudes toward IOKSS is associated mainly with their individual characteristics (knowledge-power perception, knowledge self-efficacy, personal innovativeness, and technology self-efficacy) and their relationship with their peers (attitude, trust, and interactivity). Other factors significantly related to knowledge workers were their perception of the proposed IOKSS's ease of use and usefulness, organization structure, and sector standardization.

Even with limited data collection and analysis, these study findings provided significant preliminary insights for practitioners and researchers. The study identified and provided reliable and valid measurements for researchers and practitioners to assess key factors associated with knowledge workers' adoption of IOKSS. The study identified a list of factors that may contribute to knowledge workers' adoption of IOKSS, which can be used for planning and organizational decisions for their adoption of IOKSS. This assessment can be very valuable for

developing countries, as technological innovations such as IOKSS can be crucial for training and building human resources, as well as national knowledge management.

This preliminary study has some limitations. First, the sample size was only 36. To finalize the study and detect valid, reliable, and significant factors, a larger sample size is needed from the health sector or even other sectors. Also, this presented study was based on a single regression analysis, hence a rigorous multivariate analysis should be conducted on the final collected data.

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