Investigation of Cloud ERP Adoption in the Healthcare Industry Through Technology-Organization-Environment (TOE) Framework: Qualitative Study

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ABSTRACT

There is an accelerated migration from on-premise ERP to Cloud ERP systems in many industries, but this transition is relatively slow in the healthcare industry. To address this concern, the authors developed a research model based on technology-organization-environment (TOE) framework and explored it in the healthcare industry through semi-structured interviews with IT managers and finance managers. The authors found noticeable differences between small-sized and large-sized healthcare organizations as well as the perceptions of IT managers and finance managers in Cloud ERP adoption decisions. They discussed these findings and proposed future research questions on Cloud ERP adoption in the healthcare industry.

KEYWORDS

Cloud Computing, Cloud ERP, Enterprise Resource Planning, Healthcare, Technology Adoption

1. INTRODUCTION

In the field of information systems, information technology adoption has been one of the extensively researched areas (Karahanna et al., 1999; Oliveira and Martins, 2011; Rad et al., 2018). This research identified that information technology adoption has been considered as an essential organizational decision to enhance competitiveness by significantly increasing productivity and quality of service and product delivery (Karahanna et al., 1999). One recent technology that transforms information technology industry and organizational practices is Cloud computing (Velte et al., 2009; Armbrust et al., 2010). In simple terms, Cloud computing could be considered as Internet based storage and computational capabilities. Traditionally, organizations run applications on a physical computer or

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server in their facility (i.e., on-premise). However, now Cloud computing allows organizations access to the same kind of applications through the Internet.

While there are many different Cloud computing applications, one specific application has drawn attention to practitioners and researchers alike recently is: Cloud based Enterprise Resource Planning (ERP) systems. ERP is a set of software modules to manage and seamlessly integrate business functions, such as finance, human resources, and operations (Shehab et al., 2004; Monk and Wagner, 2012). On-premises ERP systems could enhance organizational performance (Shang and Seddon, 2002; Nwankpa and 2015), while they may require extensive financial resources as well as knowledgeable and skillful professionals for implementation and execution (Gargeya and Brady, 2005; Maditinos et al., 2012). On the other hand, Cloud based ERP systems also could enhance the organizational performance, and often require less financial and human resources, which results in cost reduction, accelerating adoption in a variety of service and manufacturing industries (Peng and Gala, 2014; Gupta et al., 2017; Gupta et al 2020).

However, academic articles on Cloud ERP adoption focusing solely on the healthcare sector are rare (e.g., Mucheleka & Halonen, 2015; Nasir & Khan, 2020). The research investigated Cloud computing noted that the rate of information technology adoption in general has been relatively slow in healthcare (Christensen and Remler, 2009; Ghafur and Schneider, 2019; Kuan, 2019; Stein et al. 2020). Healthcare is a complex service, where the value is co-created by multiple parties (e.g., healthcare organization, insurance company and government agencies) (Damali et al., 2016). Because of its complex nature, decision-making is often slow in healthcare. This could be a concern though, since healthcare is one of the major industries in the US - 17.7% of the GDP (CMS.gov, 2020), and the outcome significantly influences the well-being of people (Damali et al., 2016). Thus, it is important to investigate Cloud ERP adoption in the healthcare context by answering the question: *What factors influence Cloud ERP adoption in healthcare organizations?*

We used the Technology-Organization-Environment (TOE) framework (Tornatzky and Fleisher, 1990) to explore the factors influencing technology adoption in healthcare. The framework describes three factors that influence technology adoption, these are: technological context, organizational context, and environmental context. The technology context is based on the technology adoption model of Rogers (2003), primarily considering the relative advantages or disadvantages of the technology. The organizational context refers to the descriptive characteristics of the firm, such as organizational size, resource availability, organizational readiness and top management support.; The environmental context comprises regulatory forces, such as government and competition (Alshamaila et al., 2013; Gangwar et al., 2015; Low et al., 2011; Oliveira et al., 2012). While there are various other technology adoption models and frameworks, TOE is a robust typology to classify a wide range of factors affecting technology adoption by organizations.

2. CLOUD ERP ADOPTION AND TOE FRAMEWORK

While significant progress has been made in the Cloud ERP research, most studies lack an overarching technology adoption theory. Technology adoption and Cloud computing adoption literature use various influential theories, which can guide Cloud ERP adoption research. Sharma et al. (2020) identified that the most frequently used models of Cloud computing adoption between 2007 and 2018 are: technology, organization, environment (TOE) framework, diffusion of innovation (DOI) model, and technology acceptance model (TAM). In this study, we used the TOE model explaining organizational level decision making, rather than individual level decision making in the technology adoption. As stated, TOE framework describes three contexts that influence technology adoption in organizations; these are: (1) the technological context, (2) the organizational context, and (3) the environmental context (Tornatzky and Fleisher, 1990). In the following three subsections, we organize and integrate the Cloud ERP adoption literature into the TOE framework.

2.1. Technology Context

The foundation of technological context is the Rogers' (2003) technology adoption model. The research on Cloud computing and Cloud ERP particularly focused on relative advantages and disadvantages of a technology (Alshamaila et al., 2013; Gangwar et al., 2015; Low et al., 2011; Oliveira et al., 2012; Peng and Gala, 2014). Specifically, we identified that Cloud ERP research studied seven distinct topics related to the advantages and disadvantages of Cloud ERP relative to the on-premises ERP. These are cost; system speed and performance; system upgradability; mobility and accessibility; data privacy, control and security; vendor lock-in, and integration difficulties:

- **Cost:** On-premises ERP systems require a facility, owned and managed by the company to run servers and hardware, while Cloud ERP systems do not require costly in-house IT facilities (Peng and Gala, 2014; Purohit et al., 2012; Castellina, 2011). Also, Cloud ERP may reduce the need of expensive IT professionals to operate and maintain the system (Peng and Gala, 2014; Johansson et al., 2015; Elmonem et al., 2016). Additionally, some upfront costs, such as initial subscription fees and employee training are reported to be usually less for Cloud ERP systems (Peng and Gala, 2014; Johansson et al., 2015; Purohit et al., 2012; Elmonem et al., 2016; Castellina, 2011).
- **System speed and performance:** Cloud ERP systems require significantly shorter time to implement; this faster, perhaps seamless implementation allows organizations to achieve ERP benefits quickly (Johansson et al., 2015; Purohit et al., 2012; Elmonem et al., 2016; Elragal and El Kommos, 2012; Castellina, 2011). Also, Cloud ERP may result in efficiencies due to multitasking. Since the vendors use hundreds of servers and offer large data storage capacity, an ongoing operation (such as MRP calculations) would not slow down another ERP functionality, such as searching product or order information for customers (Peng and Gala, 2014). In addition, some research reported that Cloud ERP systems can allow access to the most advanced technology resulting in higher speeds and improved performance (Johansson et al., 2015; Castellina, 2011).
- **Upgradability:** Cloud ERP upgrades are centralized, automated and seamless, made by the ERP vendor, as part of the vendor's core competency (Peng and Gala, 2014; Castellina, 2011). Furthermore, Cloud ERP could be more flexible and scalable when module by module upgrading is possible. (Peng and Gala, 2014; Johansson et al., 2015; Purohit et al., 2012; Elmonem et al., 2016; Elragal and El Kommos, 2012). Flexibility (i.e., ability to customize the ERP system) and scalability (i.e., ability to change the capacity in a cost efficient manner) enables organizations to adapt rapidly and with minimal cost to the changing needs of the market (Johansson et al., 2015). In addition, the research found that ERP vendors usually have the most advanced IT infrastructure and expertise, so they can offer the latest upgrades more frequently (Johansson et al., 2015; Elmonem et al., 2016).
- **Mobility and accessibility:** The ERP system should be accessed from anywhere through a web browser and a mobile device (Peng and Gala, 2014; Johansson et al., 2015; Purohit et al., 2012; Elmonem et al., 2016). This could be particularly critical for personnel who work outside of the organization in the field and in multiple branches. Cloud ERP systems are already mobile by design unlike on premises ERP systems which need additional hardware and on-site IT personnel for each location (Purohit et al., 2012; Johansson et al., 2015; Elmonem et al., 2016).
- **Data privacy, control and security:** Data privacy is data's exposure to unauthorized parties. Loss of control is related non-transparency in data handling and storage processes. Data security is related to protections on data against acts of nature as well as hacker attacks. Cloud ERP data could be stored in different locations around the globe to achieve cost efficiencies for the vendor (Peng and Gala, 2014). Clients could be concerned that data can be exposed, corrupted, stolen or lost for good in this distributed processing and storage environment where accountability is elusive. Especially organizations with critical data, such as those in healthcare with patients, and banks with financial accounts, could be overly sensitive (Elmonem et al., 2016).

- **Vendor lock-in:** Adoption of ERP systems may create customer dependency on a vendor for ERP services and incur high switching costs. Any ERP adoption, including Cloud ERP, requires a high level of commitment, time, and effort, leading to high switching cost. Further, the Service Level Agreement (SLA) may give the Cloud vendor additional rights to make the switch more difficult (Peng and Gala, 2014; Saa et al., 2017). Also, Cloud ERP can make the organization dependent on not only the vendor but also the vendor's supply chain network (e.g. Amazon, IBM, Google, Microsoft) which may introduce additional dependencies for the client (Gupta et al., 2017; Saa et al., 2017).
- **Integration difficulties:** Integration difficulty is associated with compatibility of the technology, or "the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of the potential adopter" (Rogers, 2003, pp. 240). Cloud ERP research explained that these systems can be incompatible with existing legacy systems, slowing down the adoption (Peng and Gala, 2014; Elmonem et al., 2016; Gupta et al., 2017).

2.2. Organizational Context

Cloud computing and Cloud ERP research investigated four organizational context factors: organizational size, resource availability, top management support and organizational readiness (Alshamaila et al., 2013; Gangwar et al., 2015; Low et al., 2011; Oliveira et al., 2012). Cloud ERP research found that the *size* of the organization influences adoption. Specifically, organizational size moderate the impact of technological context factors on adoption decision (Johansson et al., 2015; Purohit et al., 2012; Elmonem et al., 2016; Gupta et al., 2017; Saa et al., 2017; Elragal and El Kommos, 2012). For instance, some research reported that small- and medium-sized organizations were more lenient on Cloud ERP adoption than large-sized organizations, due to lower upfront costs and faster implementation with Cloud ERP (Castellina, 2011; Saa et al., 2017; Elragal and El Kommos, 2012). Further, this research identified that organizational size is highly associated with resource availability. Specifically, small and medium-sized organizations may not have enough IT resources to upgrade on a continuous basis, or may not have access to the latest technologies and software. Therefore, Cloud ERP could be the most viable option for them to have the state-of-the-art-technology (Johansson et al., 2015).

Top management may not support Cloud ERP because of financial risks and strategic mismatch (Peng and Gala, 2014; Elmonem et al., 2016); further, organizations may not be ready, primarily due to unwillingness for making process and cultural changes. This research mentioned that the change management could be difficult, and organizations may not know how to communicate the change and implications resulting from the Cloud ERP adoption (Peng and Gala, 2014; Johansson et al., 2015). Managerial lack of adequate technical knowledge on Cloud technology, its capabilities and limitations, inability to assess its benefits, costs and risks, unfamiliarity with legal, jurisdictional and compliance issues of Cloud ERP are cited by the researchers as hindrances for Cloud ERP adoption. The research also found that the organization may have difficulty understanding how to implement Cloud ERP in their internal business processes, resulting in a decision not to choose Cloud ERP (Peng and Gala, 2014; Elmonem et al., 2016; Gupta et al., 2017).

2.3. Environmental Context

Environmental context includes the factors related to industry and stakeholders that might predict the technology adoption. The adoption decisions can be associated with the following environmental factors:

- **Government influence:** Our review indicated governmental influence on information technology adoption is through regulations often addressing data exchange needs and security breaches (Rezaeibagha, 2015). A number of regulations have been put in place since 1996 including

Electronic Health/Medical Records (EHR/EMR), Health Insurance Portability and Accountability Act (HIPAA) and Health Information Technology for Economic and Clinical Health Act (HITECH). HIPAA journal reports a significant number of data breaches between 2009 and 2020, reaching a peak at 100 million affected individuals in 2015 (HIPAAJournal.com, 2021). HIPAA regulations aim to set the standards for security and privacy to reduce breaches while facilitating data exchange between authorized parties. These security breaches and government regulations may require healthcare organizations to update their software and security measures while being more calculated in high risk technology adoption decisions.

- **Competition and peer pressure:** Competitive pressure can be defined as the level of pressure felt by the organization from competitors within the industry and may influence Cloud ERP adoption (Oliveira and Martins, 2010). Intense competition could be an important determinant of IT adoption (Low et al., 2011; Alharbi et al., 2017; Alshamaila et al., 2013).
- **Accreditation agencies:** The Joint Commission, the primary healthcare accreditation agency, may affect Cloud ERP adoption. They recommend that healthcare technology is rapidly evolving and its use is growing, presenting new challenges to healthcare organizations. This requires safely implementing health information and converging technologies to take a broader look at health IT, particularly the socio-technical factors having an impact on its safe use (jointcommission.org, 2021). Further, Electronic Healthcare Network Accreditation Commission also may play a role in the Cloud ERP adoption. Concerns over security and privacy can be overcome by an IT accreditation agency giving a third-party “stamp of approval” to healthcare organizations and Cloud Service providers who have demonstrated secure management of protected health information (EHNAC.org, 2021).

Our literature review on Cloud computing and Cloud ERP adoption led to a research model as seen in Figure 1 to be explored using a qualitative study. Note that similar models for various industries (not specifically healthcare) were used in Cloud computing adoptions literature (e.g., Low et al., 2011; Alshamaila, et al., 2013; Gupta et al., 2017).

Figure 1. Research model

3. METHODOLOGY

A qualitative methodology is chosen to explore the Cloud ERP adoption in the healthcare industry. This methodology has been considered as an effective one to explore a relatively less understood

phenomenon as well as to gain a holistic understanding needed for future quantitative studies (Trochim and Donnelly, 2006). We also acknowledge that qualitative methodology compromises generalizability (external validity), since it investigates eight cases.

Specifically, we explored the model through interviews with six IT managers and two finance managers in eight different healthcare organizations that adopted some form of Cloud ERP system. All these managers are involved in the technology adoption decisions previously. Thus, they were able to share organizational stories and perspectives related to the adoption. Two of them are entry level (less than 5 years of experience), the others are mid- or upper-level managers (5 of them have more than 20 years of experience). All the managers work in healthcare organizations located in the Midwest United States. Three are independent, small-sized healthcare facilities and the other five are large-sized hospital networks. The interviews were semi-structured, guided (not strictly followed) by questions related to the research model.

4. FINDINGS AND DISCUSSIONS

The answers for open-ended questions provided deeper insights which we explained and discussed in the following subsections: technological context (4.1), organizational context (4.2), and environmental context (4.3).

4.1. Technological Context

Finding 1: For the IT managers of small-sized healthcare organizations, cost is the most important relative advantage of Cloud ERP compared to on-premises ERP; while for the IT managers of large-sized healthcare organizations, improved system upgradability is the most important relative advantage of Cloud ERP.

One of the managers of the small-sized healthcare organizations, who worked previously in a larger organization, explained that the lack of financial resources is the main reason to make the Cloud ERP option more viable than the on-premises option:

Cost reduction is always important for us, we do not have the resources of large hospitals. (IT manager of a small-sized organization)

All three IT managers of large-sized organizations consider that improved system upgradability is the most important reason to adopt Cloud ERP systems. Reduced cost is ranked the third after improved mobility and accessibility. They all pointed out that they are a network of hospitals and clinics serving patients in multiple locations, making Cloud ERP systems to be highly advantageous in terms of system upgradability:

Budgetary pressures exist but faster system upgrades are critical for our systems because we are a network hospital. (IT manager of a large-sized organization)

Easy upgrades in multiple branches completed at the same time is important. System upgrades used to be a problem with the old (i.e., on-premises) system. (IT manager of a large-sized organization)

Most research on Cloud ERP adoption indicates that the cost reduction is the most important factor for adoption (e.g. Castellina 2011, Peng & Gala, 2014) which holds true in our findings for mostly *small-sized* healthcare organizations. Some interviewees in Peng & Gala (2014) mentioned that it is more difficult to upgrade on-premises ERP across diverse geographical locations. Our finding

supported this idea that perhaps more than the organizational size, it is the geographical dispersion of the organization that supports Cloud ERP adoption.

Finding 2: For the finance managers of large-sized healthcare organizations, cost is the most important relative advantage of Cloud ERP; while for the IT managers of large-sized organizations, improved system upgradability is the most important relative advantage.

Our interviews revealed an organizational conflict regarding Cloud ERP adoption between finance and IT managers, explained by a finance manager as:

IT people and finance people often use different decision criteria in technology adoption. We (finance managers) want to know the short term and long-term costs of having the technology. Often this requires a complex cost calculation. However, IT people often focus on system performance, easy to use systems, and so on, which are less objective, less measurable criteria. So, conflicts are not unusual between us (these two groups). I know the experience of IT managers is critical to make successful decisions. But because these decisions are collectively made, IT managers need to share more information and knowledge to make a strong case for the technology.

We recently had this Cloud ERP adoption conflict within the organization. Finance and operations managers wanted to purchase a Cloud product A from vendor A, however our human resources people wanted to keep product B due to ease of use. After long negotiations, the hospital decided to go for Cloud product A due to significant price difference. I know HR people were not happy with that decision.

A similar type of conflict occurred about the Cloud based electronic medical system adoption. Providers wanted Cloud product C, but product C was significantly more expensive. The organization did not have enough resources for product C, so we went with product D. (Finance manager of a large-sized organization)

Based on the interview results, it can be concluded that differences in views and backgrounds of organizational decision makers may postpone or even cancel Cloud ERP adoption.

Finding 3: For the majority of the managers, integration difficulties are the most significant concern for Cloud ERP adoption.

Most of the managers interviewed considered integration difficulty is the number-one risk in Cloud ERP adoption:

We use many other systems, and we want the Cloud systems compatible with existing systems. (IT manager of a large-sized organization)

I am not an expert on how technology works, but I am aware that the new software has to be integrated with the systems in use. Eventually, people discover workarounds to overcome integration problems, but this results in frustration and reduced productivity. (Finance manager of a large-sized organization)

Consistently, system compatibility is also reported in the literature as one of the barriers in adopting Cloud ERP. However, the literature indicated a somewhat lower importance ranking than our findings. For example, Elmonem et al. (2016) found that integration is the second most important challenge after security risks. Gupta et al. (2017)'s showed the integration issue ranking 6th for

smaller and 9th for larger organizations. Also, Oliveira et al. (2014) reports mixed results found in the literature in terms of compatibility. However, higher importance ranking of integration in our findings could be explained by disconnected, patchy software use in the healthcare sector. This is consistent with Schulte and Fry (2019) reporting growing problems of integration issues in healthcare data and software.

Finding 4: For most of the managers, Cloud ERP does not provide relative advantages compared to in-promises ERP in terms of speed and performance.

The managers think that system speed and performance is not a differentiating factor for Cloud ERP adoption. In other words, this is a hygiene factor; it is needed but does not seem to be decisive, possibly when it comes to a healthcare context. All interviewees in Peng and Gala, (2014) agree that speed and performance would increase with Cloud ERP, positively contributing Cloud ERP adoption. However, this could be true in manufacturing organizations in which extensive MRP calculations require high system speed and performance while healthcare will not require such CPU intensive processes. In support of this idea, Oliveira et al. (2014) found different Cloud ERP adoption behaviors between services and manufacturing industries.

Finding 5: For most of the managers, system privacy, control and security are not a major concern for Cloud ERP adoption.

This finding was one of the most unexpected one for us. The interviews indicate that privacy, control, and security are no longer a major risk factor for healthcare organizations, in the context of ERP adoption. This is a finding contrary to most of the literature we reviewed. For example, in Elmonem et al. (2016) and Gupta et al. (2017), security risk is the most important challenge for adopting Cloud ERP systems. Considering that Cloud technology has rapidly developed in recent years, these contradictory findings could be explained by: (1) the recent pervasiveness and manager awareness of Cloud technology, and (2) increased data security measures implemented by Cloud vendors and infrastructure providers, resulting in a higher reputation and trust for Cloud services. This explanation is consistent with Oliveira et al. (2014). Furthermore, small hospitals uniformly indicated risk of security is not a concern, which is consistent with findings of Saa et al. (2017).

Some manager quotes include:

Initially, we thought security, privacy and transparency could be a problem, but we realized that it is not an issue. However, we acknowledge that healthcare is a little slow (in adopting Cloud systems) compared to other services because of these concerns. (IT manager of a small-sized organization)

We have the resources to ensure technology is safe and secure for on-premises and other systems in the Cloud (e.g., due to having an IT department), so security is less an issue now than it was 10 years ago. (IT manager of a large-sized organization)

Security and privacy are important in healthcare. However, we are not sure if managing a technology in house or Cloud is a better way to make things secure. We work closely with both internal and external departments to make sure our own people understand their role to ensure security and privacy. We know that once, because of an employee mistake, our system became vulnerable to outside attacks, and it was a very stressful time for everyone. Now we give constant training to employees about security and privacy, with or without the system being run inhouse or in the Cloud. (Finance manager of a large-sized organization)

Security is an issue, but it is difficult to decide how to make sure security and privacy is strong. This is a problem both in-house or Cloud. In both cases, you need a group of highly skillful people to ensure security. We have training and education programs for providers and employees on a regular basis. (Finance manager of a large-sized organization)

Finding 6: For many of the managers, vendor lock-in is not a concern for Cloud ERP adoption.

Managers shared mixed opinions about vendor lock-in, none being strong in their opinions. Findings in Gupta et al. (2017) and Elmonem et al. (2016) indicate it is a major concern in larger organizations. These researchers discussed implications of vendor lock-in (i.e. development, control and monitoring of software and data in the hands of vendors in the long run, and SLA/legal issues). Both studies found that larger organizations ranked this set of issues higher than the smaller organizations.

4.2. Organizational Context

Finding 7: For small and large-sized healthcare organizations, managers are concerned about the lack of financial and human resources, and organizational challenges in adopting Cloud ERP.

Small-sized healthcare organizations are more vulnerable to the implications of having less financial and human resources to implement Cloud ERP than large-sized organizations. Even if small-sized organizations are aware of its benefits, they might not implement it due to lack of resources. Most managers of the large-sized organizations stated that they have adequate financial and human resources to implement Cloud ERP, while finance managers are still concerned due to the financial risks in difficult times:

The cost (of the technology) and availability of the resources are very important. When there is a lack of resources, just like now, because of Covid. The hospital uses most of the resources for mission critical activities. So, it is not the time to take financial risks to implement new and expensive technologies. For example, we did not purchase a particular software application working on the Cloud recently because of lack of resources, even though we knew the benefits. (Finance manager of a large-sized organization)

Covid made technology adoptions slower, but still the discussions are on-going. The organization is still thinking about how to make things better.

In terms of organizational challenges, most managers ranked this issue as the first or second most important barrier for Cloud ERP adoption, focusing on decision making difficulties:

We are a relatively small organization and do not have the same resources as larger network hospitals and so we have fewer options in making big decisions such as getting new technology. (IT manager of a small-sized organization)

The movement is slow due to the organization that is too big. There are too many committees, with too many different expectations. It is a very time taking process to find the decision that satisfies everyone. In addition, these decisions involve multiple criteria, some are objective like time and cost, while some are subjective like quality and ease of use. Usually in decision making like Cloud ERP, there are people from all different departments, such as IT, OM, Finance, Accounting, HR, and the CEO. And think of that a network hospital has many executive administrations, so the decision making is

often made by a large group of people. Yes, we have resources but at the same time we do not have the agility of a small organization. (Finance manager of a large-sized organization)

4.3. Environmental Context

Finding 8: For small and large-sized healthcare organizational environmental challenges are not a barrier for Cloud ERP adoption.

It appears that pressures from some external stakeholders (government, insurance companies, peer organizations and accreditation agencies) show a similar pattern in the interviews and do not play a major role in Cloud ERP adoption. For example, in terms of government impact, currently there is no regulation insisting on adopting a Cloud ERP system, or vice versa an on-premises ERP system in the healthcare sector. Also, due to the strict enforcement of HIPAA and HITECH by the government, Cloud ERP or on-premises ERP would not matter in terms of privacy and data security, because both systems must have the same level of high compliance (CDC.gov, 2020). Representative quotes of managers:

In addition, outside organizations can influence their technology adoption decisions. However, for Cloud ERP, the external organizations were not that critical. HIPAA is always important though. But it is more important when the data has patient information. ERP is mostly about back office information, so security and the impact of other organizations are less important for Cloud ERP decision making. (Finance manager of a large-sized organization)

Government, insurance companies and accreditation agencies frequently come up with new regulations and rules, and we need to work with responsive ERP vendors in compliance with these rules. (IT manager of a large-sized organization)

5. CONCLUSION AND FUTURE RESEARCH

Information technology adoption in the healthcare industry has been significantly improving productivity and quality. However, our research identified a dilemma related to the technology adoption. Managers interviewed agreed that Cloud ERP adoption has more advantages than the disadvantages, while they also believed that Cloud ERP adoption is slow in the healthcare industry. We argue that there is a need for future research to understand this dilemma, for which we propose the following two research questions:

Question 1: What is the impact of organizational size and geographic dispersion on Cloud ERP adoption?

The literature did not separate the difference between organizational size and organizational geographic dispersion. However, our interviews revealed that more than organizational size, the geographic dispersion of the healthcare organization can be a better predictor of Cloud ERP adoption. Specifically, managers stated that a large-sized organization in a concentrated location might gain less benefits from Cloud ERP than a large-sized organization with many smaller units spread over a large geographic area.

Question 2: To what extent differences in views of organizational decision makers (such as IT and Finance managers) affect Cloud ERP adoptions?

Our findings revealed that in the context of Cloud computing and Cloud ERP adoption in healthcare, there is a need to understand organizational conflicts and their resolutions. To the best of our knowledge, the conflicts in organizational decisions have not been addressed in this line of research. However, we found that conflicts are quite common, and lack of effective communication and group decision making could be a factor in delayed, or obstructed Cloud ERP adoption.

The main limitation of our qualitative study is the generalizability of our findings. We interviewed only six IT managers and two finance managers; a relatively small sample on which our conclusions are made. Nevertheless, this study is one of the few exploring the issues surrounding Cloud ERP adoption in the healthcare industry. In addition, it provided a comprehensive research model for future research questions to be explored with quantitative methods.

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