The Determinants of RFID Use and Its Benefits in Hospitals: An Empirical Study Examining Beyond Adoption

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Abstract. Going beyond traditional 'adoption', this study examines the determinants of the 'use' of radio frequency identification (RFID) technology and identifies the perceived benefits of such use. From extant literature, we developed a research model from organizational setting (i.e., hospitals), which we validated using survey data from 142 healthcare organizations. The collected data were analyzed by partial-least-squares (PLS) methods. The results show that a hospital's RFID use is influenced by the following technological organizational-environmental (TOE) factors: *information privacy* (technology), *absorptive capacity* and *resource readiness* (organization), and *coercive pressure* (environment). RFID use, in turn, impacts both economic and operational benefits. Additionally, *size of hospital* found to be an important control variable to RFID use. Therefore we further investigated the combined effect of *hospital size* and *RFID use* on *perceived benefits* (i.e., the moderation effect). The results showed that *hospital size* has moderating effect on the relationship between *RFID use* and *economic benefits,* but not between *RFID use* and *operational benefits*. The implications, particularly from the perspective of a healthcare setting, have been discussed.

Keywords: RFID · Adoption · Use · Hospital · TOE framework
Empirical

1 Introduction

In the field of information systems (IS), in order to examine the success (or failure) of an innovation, behavioral studies have traditionally and predominantly focused on the adoption perspective – by examining the process by which an innovation is accepted [1]. Nevertheless, some studies also examined the 'continuance' behavior in individual setting [2], which is slightly different in organizational setting where adoption is followed by routinization and extension [3]. The common aspect of both types of studies is they rely on 'intention' of users – both to adopt and continue the use of an innovation. However, scholars argue that 'intention' does not necessarily always confirm the actual success of a technology. They suggest to ascertain actual usage criteria

S. A. Al-Sharhan et al. (Eds.): I3E 2018, LNCS 11195, pp. 468–479, 2018.
https://doi.org/10.1007/978-3-030-02131-3_42

believing 'usage' "as a surrogate measure for information systems success" [4, p. 144]. Also, Shih and Venkatesh [5] acknowledged that studying 'adoption' is important but we should investigate more on the 'use' behavior. They further suggested that, in order to claim the success (or failure) of an innovation, the relevant outcomes should be studied. Therefore, this research aims to examine the determinants of RFID use and the perceived benefits of such use.

Though RFID technology has been invented in 1940s, its industrial and commercial application was not discernible before the mandates imposed by Wal*Mart and the Department of Defense (DoD), USA to their suppliers in late 90 s. Since then, the application and use of RFID continues to grow. According to Mark Roberti, the Editor of RFID Journal, *"companies will have no choice but to use RFID, just as they have no choice but to use the Internet today"* [6, p. 16]. His prediction comes true as RFID technology now has been used in almost every industry including retail, manufacturing, service, and agriculture [7]. In the service industry itself, RFID has been used in libraries, museums, and hospitals [7].

A basic RFID system consists of three components: (a) each *tag* is comprised of a microchip and an antenna, (b) *reader* communicates with tags, and (c) *software/middleware* transfers data. The tags, which can be attached to virtually anything, receive signal with their antennas and 'backscatter' their stored data to the reader via low-power radio frequencies [8]. The reader decodes received data and transfers it to database(s) through middleware. RFID can identify an object uniquely and can store large amount of data ($\sim$30 times more than a traditional barcode) [8]. In fact, RFID is the only technology that permits simultaneous scanning. Hence, RFID has tremendous potential in hospitals because of its ability to identify the patients as well as medical devices uniquely and efficiently with no human interventions (e.g., as manual scanning is required with barcode technology) [8]. In recent times, many hospitals and healthcare facilities use RFID tags on patient wristbands (e.g., newborn infants) and valuable assets to provide accurate identification. Also RFID readers install at doors and other appropriate locations determine patients' and assets' locations. This mechanism additionally restricts unauthorized access to designated areas [9].

Looking at the literature related to RFID adoption-diffusion in hospitals, few attempts can be reported. For example, along with the literature review [7], Cao et al. [10] conducted a case study explaining adoption of RFID in hospitals. Similarly, Chen et al. [2] identified the key drivers for continued use of RFID in emergency rooms. However, a convincing growth is yet to observe in terms of RFID use in hospitals [11], although RFID is believed to provide the highest possible safety to a patient, and where hospitals can save enormously by increasing efficiencies in patient care as well as managing assets [12]. It is imperative that RFID should be seriously considered by related authorities. One potential solution is to develop confidence to the decision-makers with providing empirical evidence and successful cases from already-adopters. Our study examines the elements that may lead to RFID use in hospitals, it also incorporates the perceived benefits; and thus we reveal the perceptions of the actual players who already use RFID. Thus, this study offers implications to decision-makers to understand important factors and thereby to take informed decisions.

2 The Research Model

2.1 The Determinants of RFID Use in Hospitals

In order to examine the determinants of RFID use in hospitals, the technology organization-environment (TOE) framework, proposed by Tornatzky and Fleischer [13], has been considered as the theoretical underpinning. TOE is one of the popular theoretical frameworks used to study the organizational behavior towards accepting a technological innovation. TOE posits that the acceptance decision of a technology is dependent on technological, organizational, and environmental characteristics. Since its inception TOE has been tested in various domains and received a lot of empirical support; RFID field is no exception [e.g., 2, 10]. However, although a few attempts have been observed to identify TOE variables and to develop a conceptual/research model [2, 10], as far the authors' knowledge, no empirical work has been reported that validated a TOE model in hospitals' setting. Moreover, little is known if TOE framework holds right when is extended beyond the 'acceptance' phenomenon (i.e., to study 'use'). Based on the extant literature on RFID, we draw upon this framework to understand the use of RFID and the relevant benefits in an organizational setting.

Technological Dimensions. Tornatzky and Fleischer [13] evidenced that relative advantage (e.g., perceived usefulness), complexity, and compatibility are the main technological factors that impact technology implementation; their role has been well studied in RFID-literature [e.g., 14]. In addition, in the context of RFID use in hospitals, *information privacy* of the customers and *information accuracy* are critical [7] and therefore have been considered as the technological variables in our model.

Information Privacy. In healthcare setting, *informational privacy* is the right of a patient to control "over the collection, use, disclosure and retention of his or her personal information, including his or her personal health information" [15, p. 7]. In this definition the critical aspect is *personal health information*, which the Personal Health Information Protection Act (PHIPA) defines as identifying information about an individual that, among other things, relates to the physical or mental health of the individual, identifies a provider of health care to the individual, or identifies the substitute decision-maker of the individual [17]. Under PHIPA compliance, health service custodians (e.g., hospitals, health-care practitioners, pharmacies) are allowed to collect, use and disclose personal health information only with the consent of the individual to whom the personal health information relates. They are also required to comply with the wishes of an individual who withholds or withdraws consent, or who gives express instructions that the information must not be used or disclosed elsewhere [15].

RFID systems introduce a key ethical concern regarding information privacy because of its strength (e.g., unique identification of the objects, tracking and tracing of the movements of objects, etc.). It is understood that patients' confidentiality is extremely important and highly challenging in healthcare industry than in other industries (e.g., retail). In healthcare facilities, when an RFID tag is associated with a patient, a unique number is assigned to the patient. The number can associate with any type of personal information, such as patient name, gender, address, medical history, drug therapy program, and more. In our context, privacy concerns can include

inappropriate collection, intentional misuse, or unauthorized disclosure of healthcare information resulting from RFID use. The higher provision of protecting patients' personal health information generated from an RFID system, the higher will be its use [7, 10]. Therefore:

H_1: Information privacy is positively associated with RFID use in hospitals.

Data Accuracy. Accuracy of data generated by RFID systems is critical for hospitals and patients. However, RFID systems are not always reliable. The accuracy of RFID data is dependent on several factors including tagged object, tag placement, angle of rotation, read distance, and if the transmission is affected by electromagnetic waves generated by other systems. Besides, presence of local magnetic interference, metal objects, or liquid containing items can also affect read accuracy and thus data accuracy [7]. As RFID signals can be affected by interference of the other devices using low-frequencies and transmit signals, data may create 'noise' and produce dirty data [17]. In a hospital, RFID systems need to be able to locate the assets (e.g., patients, doctors, medical equipment) accurately [18]. Based on common organizational behavior, higher the possibility of reliable and accurate data generated by RFID systems, there will be higher use of RFID in hospitals [7]. Therefore:

H2: Accuracy of information obtained from RFID systems is positively associated with RFID use in hospitals.

Organizational Dimensions. Organizational factors explain why some organizations perform better than others, in terms of adopting and using a technology. TOE suggests that organizational characteristics are extremely relevant and must be considered in any organizational innovation research [13]. In the context of hospitals, *absorptive capacity* and *resource readiness* are critical [10].

Absorptive Capacity. Absorptive capacity can be defined as "a set of organizational routines and strategic processes by which firms acquire, assimilate, transform, and exploit knowledge for purpose of value creation" [19, p. 198]. IS studies, dealing with organizational adoption and use of technology- and knowledge-based innovation, consider *absorptive capacity* as an important organizational characteristic [e.g., 20]. RFID studies too understand that, both the knowledge that an organization hold and obtain from different sources help them to develop managerial absorptive capacity. To be successful, acquired knowledge needs to be applied to perform operational tasks. Generally it is accepted that the higher the capability of a hospital to assimilate and exploit RFID knowledge, the higher will be the use of RFID. Hence:

H3: Absorptive capacity of the management of a hospital is positively associated with RFID use in hospitals.

Resource Readiness. A complex and expensive technological innovation like RFID needs strong resource-base. Social cognitive theory emphasize "*…People will not adopt innovations even though they are favorable disposed toward them if they lack the money, the skills, or the resources that may be needed. The more resources innovations require, the lower their adoptability*" [21, p. 290]. RFID adoption and use comes with the availability of financial and human resources of an organization [3].

Financial resource is required to pay the associated costs including implementation, integration, and on-going costs. And, availability of technical resources, such as technical know-how and expertise, are critical for RFID use because RFID projects require technical expertise to address the implementation and maintenance challenges and to customize the software according to the business processes [3]. Currently, lack of skilled RFID professionals is a major challenge; around 80% of the companies do not have access to skilled RFID workers [22]. It is more likely that a hospital with sufficient resource readiness will be more in a position to use RFID than the others [23]. Thus:

H4: Resource readiness is positively associated with RFID use in hospitals.

Environmental Dimensions. Organizations do not operate in isolation; they do need to comply with the rules and regulations from external environment (e.g., industry standards) while fighting against competitors [13]. Recalling the impact of Wal*Mart and DoD, in general, environmental factors have been recognized as important drivers for the organizational adoption of RFID. In the context of RFID technology in healthcare industry, the environmental factors are *coercive pressure* to compliance with legislations and *environmental uncertainty* [3].

Coercive Pressure. Unlike retail supply chain where Wal*Mart and other retailers are driving RFID deployment, there are no entities requiring health care providers to implement RFID. However, the U.S. Food and Drug Administration (FDA) is planning to mandate RFID technology for device and patient identification in hospitals [8]. Also, FDA and the Healthcare Distribution Management Association (HDMA) issued an 'endorsement', however not a mandate, recommending tagging drugs at palletlevel (but encouraging item-level tagging for the drugs that are small but expensive and therefore are more likely to be counterfeited) [9, 23]. Thus the pressure to use RFID in healthcare outlets is becoming more apparent than before. The pressure is also coming from patients, insurance companies [24], and medical practitioners [8]. Altogether, the more the pressure a hospital experiences from the external entities, the more will be RFID use. Therefore, we postulate:

H5: Coercive pressure is positively associated with RFID use in hospitals.

Environmental Uncertainty. In an RFID-based business-environment, external uncertainty is related to the inability to predict the demand of RFID data should customers' need and preference are changed [25] and uncertainty of RFID standards [24]. Kimberly and Evanisko [26] found that environmental uncertainty would influence the organizational adoption of RFID in hospitals. Since RFID is still in its early stage of development and acceptance by hospitals, there are large numbers of questions that are unanswered with regard to its actual use. There are always unpleasant uncertainties about the return-on-investment and the size of the market of RFID, and with regard to the capabilities of the technology itself (see discussion on *data accuracy*). Also, to some extent, the effect of RFID on inter-organizational relationships is uncertain [25]. The cumulative impact of uncertainty is negatively associated with its use.

H6: Environmental uncertainty is negatively associated with RFID use in hospitals.

2.2 The Benefits of RFID Use in Hospitals

Economic Benefits. RFID-based systems can help prevent valuable assets and equipment from stealing [12]. It is estimated that, by implementing RFID, a 200-bed hospital can save $600,000 annually while a 500-bed could save $1 million from less shrinkage and improved staff productivity [17]. RFID systems increases hospitals' efficiencies (discussed in the next section), which also save costs through efficiency improvements [7] and improving inventory and asset tracking [24]. RFID reduces insurance premium too [7]. Consequently, an RFID system has substantial economic benefits to offer to a hospital. Therefore we propose:

H7: RFID use in hospitals is positively associated with higher economic benefits.

Operational Benefits. RFID systems increase patient care by quick retrieval of patient information [7]. RFID supports staff with immediate and accurate access to patient information, assisting quick and correct decisions. RFID systems also can identify patient's current location and traces back the prior locations and thus improve accuracy of patient information, especially for infants and old. An advanced setting also improves patient drug compliance (e.g., allergy) and alerts in case of errors (e.g., wrong medication, excessive dosage, and incompatibility with the patient). Furthermore, RFID-based asset management systems can find the required equipment with minimal delay and can save lives [2]. Besides, security can be improved by RFID enabled access control systems [1, 7]. Overall, RFID systems can improve operational efficiency significantly. Hence, we suggest:

H8: RFID use in hospitals is associated with higher operational benefits.

3 Research Method

This research adopted quantitative method. An online survey collected responses from mid-level and senior managers of hospitals from China where the hospitals have been using RFID for some time. Overall, 166 respondents were returned but 14 were unusable. Among them 62.3% are private and the rest are public hospitals. The respondents are from various positions: director and above 16.8%, departmental administrator/manager 21.6%, unit administrator/manager 32.7%, and the rest (28.9%) are executives. In terms of number of employees, 27.5% have over 500 employees, about 34.5% have between 100 and 500 employees, and the rest 38% have below 100 employees.

The constructs have been measured with items from prior literature. Specifically, *information privacy* was adopted from [29] and *data accuracy* from [18, 30]. *Absorptive capacity* was measured with items used in [19]. The measures of *resource readiness, coercive pressure, and external uncertainty* were adopted from [3]. *RFID use* was adopted from [31], *operational benefits* were from [32], and *economic benefits* from [30]. We considered the number of employees as a proxy of size of hospital [33]. Data were analyzed by partial least squares (PLS) methods [34].

4 Results

4.1 Evaluating the Measurement Model

Following standard PLS procedure, the validity of the constructs was established by examining their reliability, convergent validity, and discriminant validity. *First*, internal consistency of each construct was calculated with composite reliability (CR) value of >=0.7 [34]. *Second*, in order to evaluate convergent validity, outer loadings of the indicators and average variance extracted (AVE) were calculated; all items achieved the 0.7 threshold of loading (*see* Table 1) and the constructs with 0.5 AVE [34]. The values of CR and AVE are reported in Table 2. *Third*, discriminant validity was assessed based on two methods: cross-loading matrix (not reported in the paper because of the space constraint), and Fornell-Larcker criterion (*see* Table 2). The collective evidence suggests that the constructs demonstrate good measurement properties.

Table 1. The psychometric properties of the constructs

Items	Loading	Item	Loading
IP1. No serious privacy problem	0.912	CP1. Agencies push for RFID	0.936
IP2. Can handle personal info securely	0.937	CP2. Becoming a requirement	0.948
IP3. No concern with privacy	0.821	CP3. Without RFID will lose market	0.964
IP4. No threats to privacy	0.743	CP4. Difficult to run without RFID	0.915
DA1. Enhances data accuracy	0.942	EU1. Technology keeps changing	0.881
DA2. Enhances asset visibility	0.875	EU2. Not sure what data needed	0.933
DA3. Can capture most 'things'	0.934	EU3. Requirements vary	0.943
DA4. Locate equipment correctly	0.856	EB1. Loss prevention	0.930
AC1. Good at acquiring new knowledge	0.846	EB2. Inventory spoilage	0.900
AC2. Recognize market demand quickly	0.891	EB3. Quicken processes	0.921
AC3. Staff share (new) experience	0.882	OB1. Improves resource utilization	0.962
AC4. Clearly know how activities should be performed	0.716	OB2. Mainstreaming administrative processes	0.980
RR1. Financial resource	0.864	OB3. Improves communication	0.971
RR2. Expert human	0.932	USE1. Number of times use/day	0.901
RR3. Technical resources	0.890	USE2. Number of applications	0.910
		USE3. % of operations done by RFID	0.894

Table 2. Construct reliability and discriminant validity tests

	CR	AVE	IP	DA	AC	RR	CP	EU	EB	OP	USE
IP	0.946	0.815	**0.903**								
DA	0.916	0.734	0.412	**0.857**							
AC	0.903	0.700	0.278	0.517	**0.837**						
RR	0.913	0.723	0.506	0.634	0.263	**0.850**					
CP	0.969	0.886	0.283	0.653	0.498	0.621	**0.941**				
EU	0.943	0.846	0.398	0.806	0.272	0.737	0.658	**0.920**			
EB	0.940	0.840	0.549	0.756	0.518	0.546	0.525	0.578	**0.917**		
OB	0.980	0.943	0.821	0.192	0.204	0.440	0.050	0.154	0.419	**0.971**	
USE	0.936	0.785	0.417	0.592	0.691	0.619	0.821	0.514	0.612	0.317	**0.886**

4.2 Testing the Structural Model and Moderating Effects

The results of the structural model are summarized in Table 3. It is observed that among the eight hypotheses leading from the determinants, H1, H3, H4, and H6 were supported. Then, both hypotheses related to use and benefits (i.e., H7, H8) are accepted. The R^2 (0.831) value of *RFID use* is 'substantial'.

We also examined the effect of two control variables. It was found that *size of hospital* had significant effect on *RFID use* ($\beta = 0.110, t = 2.441, p = 0.015$), which implies that larger hospitals are more likely to be higher user of RFID. However, *type of hospital* (private *vs.* public) did not have an impact ($\beta = 0.003, t = 0.066, p = 0.947$). Since the *size of hospital* had an impact on *RFID use*, it is possible that *hospital size* also has an impact on *perceived benefits*. Therefore, we tested the moderating effect of *hospital size* on the relationship between *RFID use* and *perceived benefits*. The two stage moderation tests showed that *hospital size* moderates the relationship between *RFID use* ($\beta = 0.233, t = 2.832, p = 0.005$) and *economic benefit*, but not on the relationship between *RFID use* and *operation benefit* ($\beta = 0.058, t = 0.599, p = 0.550$).

Table 3. Hypotheses testing

	β value	*t* statistics	*p* value		β value	*t* statistics	*p* value
H1	0.093*	2.548	0.011	H5	0.541	6.319***	0.000
H2	-0.87^{ns}	0.708	0.480	H6	−0.120	1.067^{ns}	0.287
H3	0.381***	6.992	0.000	H7	0.762	9.422***	0.000
H4	0.245*	2.593	0.010	H8	0.371	2.874**	0.004

Significance level $*p < 0.05$, $**p < 0.01$, $***p < 0.001$; ns: not significant

5 Discussion and Implications

5.1 Technological Variables

The findings of this study showed statistical evidence to support a positive relationship between *information privacy* and *RFID use* in hospitals. Privacy, specifically to information, is a critical component of civilization. Everyone has the right not to

disclose (and stop others to do so) his or her personal information. This right is more critical in Asian societies where people do not feel comfortable to share medical conditions with others, especially if it is related with sexual behavior (e.g., HIV, impotence), drug treatments, and mental disorder, among many. In a traditional healthcare facility in Asia, leaking information is a common phenomenon. As RFID systems secure access control (to rooms and even documents), only authorized people can access to the customer information. Top of that, RFID systems use privacy-enhancing technological measures (e.g., anonymization), which improves information security. In case of a privacy incident, by using tracking history, at least the people who accessed the information can be obtained. Therefore, although initially RFID was treated as a technology to hamper information privacy, the current safeguard mechanisms actually prove that RFID systems rather increase data/information privacy; consequently, healthcare facilitates and patients are welcoming this technology.

However, the influence of *data accuracy* is not significant. In recent times, technological developments overcome the limitations of RFID (e.g., working in liquid and metal environments). Therefore, it is plausible that the respondents are confident that RFID is well capable of producing quality data at any environment (e.g., having other devices emitting radio signals, from any angle, etc.). Still, management should revisit strategies periodically ensuring how data accuracy can be sustained and improved.

5.2 Organizational Variables

Regarding the organizational factors it is found that both *absorptive capacity* and *resource readiness* are important for RFID use in hospitals; the relative values suggest that the former variable is more important. It is important for the hospitals' strategic management to understand the value and capability of RFID technology and then apply it in operational applications. They need to plan how the organizational knowledge can be used to apply RFID in operational operations and get the most out of it. This research indicates that a hospital which has higher absorptive capacity is better in a position to use RFID systems; in other words, higher the absorptive capacity, higher will be the use of RFID. This result suggests that absorptive capacity is a necessary condition for a hospital to use RFID to its full potential. Therefore, hospitals need to develop the ability to transform and exploit external knowledge as well as process the internal knowledge, and then develop a knowledge management system that integrates the both.

Further, the results suggest that higher resource readiness is associated with higher use of RFID in hospitals. This implies that the management of a hospital needs to configure the required resource, acquire and apply them accordingly so that the use of RFID system is increased. Alongside, they need to develop strategies to address resource issues (e.g., financing, RFID experts) when all possible business processes will be integrated in the RFID system. Such proficiency is essential for successful implementing and maintenance of RFID systems (e.g., for customization, scalability).

5.3 Environmental Variables

This study emphasizes the importance of exercising pressure to influence hospitals to use RFID technology, where applicable. Until the major healthcare agencies mandate RFID in hospitals, pressure could be exercised by the customers, consumer protection advocates, lobbyists, and insurance companies. Meanwhile, the hospitals may experience mimetic and competitive pressure. Interestingly, Angeles [35] found that firms complying with RFID mandates have higher levels of absorptive capacity than their noncompliant counterparts. Therefore, lack of knowledge or expertise would not be an excuse anymore; rather, knowledge and experience can be developed once RFID is used in business operations. Hence, there should be consistent pressure for it.

However, the influence of *(external) environmental uncertainty* is not significant, which is consistent with current literature [e.g., 3]. Given the successful deployment of RFID systems in many hospitals, the respondents can be confident that the demand for RFID-based healthcare systems is the future. The market with stringent demand of RFID-based healthcare system is increasingly getting bigger. Moreover, the technological base of RFID is quite strong since it has been proven since 1940s. Therefore, the respondents of this research obliterate the presence of external uncertainty on RFID use in hospitals.

5.4 Perceived Benefits

Our study advocates that RFID use in hospitals is strongly and positively associated with both economic and operational benefits; this is an encouraging finding against some misperceptions and worries against the benefits reaped from RFID. The main economic benefits actually derive from cost saving. Managing the (expensive) medical assets and human assets with an RFID system will potentially reduce expenses, irregularities, and corruption in a hospital while increasing efficiency. The moderation test further found that bigger hospitals derive more economic benefits from RFID use than the smaller hospitals. It is plausible that the return on investment will be quicker and positive for bigger hospitals when the RFID infrastructure is enjoyed by many operations. Similarly, the economy of scale enables the larger hospitals to lower the costs.

RFID use increases operational benefits in hospitals. The benefits mostly derive from access control and traceability mechanism. Using RFID hospitals limit unwanted access of the visitors and/or staff to certain areas. Such mechanism reduces many irregularities of hospitals operations (e.g., infant misplacing/selling, misuse of blood, organ, medicines, and machineries). Moreover, by using RFID systems hospitals can create a lifetime record of each customer, which can be further used when the patient returns. The non-significant moderation effect of *hospital size* on *operation benefits* suggests that hospitals can derive operational benefits by using RFID systems, regardless of the size. In other words, RFID does offer operational benefits to all hospitals. This encourages hospitals to use RFID systems if the financial calculations support.

6 Limitations and Future Work

This study has some limitations that can be addressed by future research. This study examined the perceived determinants and benefits of RFID use in hospitals, assuming that the 'data analysis capability' of the hospitals is same for each hospital. Also, we suspect that the dependent variable i.e., *RFID use* is over-simplified, which can be better examined with at least two dimensions namely *variety of* use and *rate of use*. It is logical to posit that higher the absorptive capacity a hospital possesses higher will be the variety of use, for example. Therefore, future study can examine the effect of the determinants on these two dimensions. Furthermore, the current study analysed cross-sectional data obtained at a single point of time; further research with longitudinal data may verify the perceptions if they hold same in different point of time (of diffusion stages e.g., implementing, routinization). Finally, a multi-group analysis comparing the perceptions and their relative importance between the already-adopters and yet-to-adopting hospitals would be interesting to understand if the perceptions are consistent and equally important.

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