How habit affects continuous use: evidence from Jordan’s national health information system

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ABSTRACT
Implementing a health information system (HIS) to enhance healthcare services and patients’ experience has become a growing trend in developing countries. Yet little is known about acquainted users’ attitudes on continuing the use of an HIS after adoption. Healthcare professionals (physicians and nurses in particular) are reluctant to use HISs because they perceive them as an interruption of their interaction with patients, thus negatively influencing their efficiency. In this study, we extend the technology acceptance model (TAM) by integrating habit as an exogenous variable that affects HISs’ perceived ease of use (PEOU) and perceived usefulness (PU) to investigate experienced healthcare professionals’ attitudes in continuing to use an HIS. The setting of this study is a developing country (Jordan) that implemented a nationwide HIS named Hakeem. The findings show that in the context of healthcare, attitude is the major determinant to continue using HISs. Findings also show that habit significantly increases healthcare professionals’ perception of PU and PEOU, which improves their attitudes toward continuing to use HISs. These findings have implications for both research and practice.

KEYWORDS
Habit; health information systems; IT continuance; technology acceptance model

Introduction
Implementing health information systems (HISs) has been a growing trend among healthcare providers in the United States and Europe. It was estimated that in 2015, 76% of US hospitals had adopted HISs compared to 34% in 20111. There is a general agreement that HISs can improve the quality of healthcare delivery, reduce the cost of medical care, and enhance the efficiency and effectiveness of healthcare organizations.2–5 Developing countries are catching up with this trend to alleviate many of their healthcare challenges.6 Healthcare service challenges vary according to economic and administrative factors, such as funding, technical readiness, quality of infrastructure, and political events.7–9 Accordingly, an HIS has become a crucial solution for developing countries because it improves the quality of healthcare service and reduces cost, and it also enhances collaboration and communication among healthcare professionals to better utilize their limited resources.10–13

While HISs have proved to be beneficial in solving the impediments of quality healthcare service, HIS implementation efforts are failing in a major way due to the complexity of the healthcare environment and professionals’ resistance to adopt the technology.14–18 From a complexity perspective, healthcare encompasses the interaction of different parties to achieve different goals. It includes patients whose goal is to achieve wellness, service providers whose goals are to provide good service to patients and to contribute to their wellness, and healthcare organizations whose goals include the wellness of patients
and financial success, among others. Healthcare also directly affects people’s health and survival, and this implies that adopting an HIS to enhance effectiveness is critical. From the resistance perspective, healthcare professionals have shown a reluctance to use HISs for reasons such as perceived reduction of their professional autonomy, the possibility of an HIS being used against them in judicial disputes, effort and performance expectancy, perceived inequity, and, most importantly, the amount of time the system will take from practitioner–patient meeting time. Accordingly, developing and adopting HISs calls for the careful integration of technological, organizational, and social factors to overcome these resistance factors.

In this paper, we study how habit affects experienced healthcare professionals’ evaluation of an HIS’s perceived outcomes. Our choice of the technology acceptance model (TAM) stems from its being the original model used to trace the external factors that affect users’ internal beliefs, attitudes, and intentions when they use information technologies (ITs). It is reported in the literature that in a healthcare context, the TAM is an appropriate model for explaining healthcare technology acceptance. The TAM’s basic premise is that users’ attitude to using a new technology influences their adoption and use decision, and that perceived usefulness (PU) and perceived ease of use (PEOU) are the determinants of the users’ attitude. The TAM was designed to predict users’ acceptance of newly adopted technologies. The dominant subsequent TAM research has focused on studying external factors that bear upon beliefs about behavioral outcomes. Extended TAM models have been used in HIS research to investigate healthcare professionals’ attitudes and behavioral intentions and have demonstrated significant results with a high variance rate. The TAM has also been applied in the literature to investigate the continuous use of information systems (IS) in different contexts.

Users’ evaluations of a system’s usage are argued to be built upon their previous experiences and changes in their decision-making process. Research has shown that past experience acts as a major indicator of future behavior. Therefore, in this paper, we posit a strong relationship between habit and the decision-making process on which PU and PEOU are evaluated by experienced users to continue using an HIS.

To the best of our knowledge, no study has examined the extent to which habit affects the attitude of continuing to use an IS in the healthcare context. Accordingly, our research objective is to answer the following questions: Does habit influence healthcare professionals’ evaluation of a healthcare technology’s outcomes, specifically its PU and PEOU? To what extent does habit influence healthcare professionals’ intention to continue using the HIS? By answering these questions, we seek to contribute to knowledge on how and to what extent habitual usage of an HIS influences the evaluations and intentions of healthcare professionals in regard to their continued usage of an HIS. Such understanding is important because professionals’ reluctance to use an HIS has proved to be a crucial factor in its failure.

The setting of this study is Jordan, a developing country that has been implementing a nationwide HIS in public hospitals and healthcare centers since 2011. The system, named Hakeem, was developed based on the Veterans Health Information Systems and Technology Architecture (VistA) to automate all aspects of the public healthcare sector in Jordan. The Hakeem HIS aims to facilitate efficient and high-quality healthcare services in Jordan. The Hakeem HIS offers numerous functionalities to healthcare professionals and patients. These functionalities include a computerized patient record system; admissions, discharge, and transfer system; a patient information management system; emergency department integration software; flow sheets; and dental, pharmacy, and laboratory systems. By providing these functionalities, Jordan’s Ministry of Health aims to improve healthcare services by utilizing the HIS’s capabilities and consequently to enhance the quality of healthcare, reduce cost, and support better decision-making among healthcare professionals.

The paper proceeds as follows. In Section 2, we discuss the theoretical background upon which we built our research model as well as the research hypotheses. In Section 3, we describe our research methodology, measurement scale, and the sample respondents. In Section 4, we describe the results
of the validity and reliability tests of the survey instrument and the results of the hypotheses tests of the proposed experienced user behavior toward continuing to use the HIS. In Section 5, we present our analysis and discussion of the results. Finally, in Section 6, we provide conclusions and suggest directions for future research.

Theoretical development of the research model

HIS adoption in developing countries

It is estimated that two-thirds of the world’s population live in so-called developing countries. Most developing countries face challenges and barriers that are different than the ones in the developed countries. In addition, challenges may differ in magnitude from one developing country to another. HISs in developing countries are still considered to be limited and not widely adopted for many reasons that need more investigation. According to Shu et al., there is limited research in the area of HIS adoption in developing countries. Sood et al., Khalifa and Ahlan, and Ahmad have argued that there is a need for more research about HISs in developing countries.

Theory of technology acceptance

To understand user behavior toward continuing to use HISs, we start with a review of the TAM, a prevalent theoretical framework in the information systems IS literature used to predict a user’s acceptance of a technology. The TAM is derived from the theory of reasoned action (TRA), which asserts that an individual’s decision to participate in behavior is based on that person’s intention to perform the behavior, which is derived from his or her attitude toward the target behavior. The intention in this context is defined as the indication of the person’s willingness to try or to exert an effort to perform a behavior. Attitude, however, is defined as the person’s evaluation of the behavior leading to an outcome, whether good or bad.

In TAM usage, the two major determinants of users’ attitudes toward a novel technology are PEOU and PU. PU is defined as “the prospective user’s subjective probability that using a specific application system will increase his or her job performance within an organizational context”. PEOU is defined as “the degree to which the prospective user expects the target system to be free of effort”.

In this study, we contextualize the TAM to the healthcare field. Hence, the participants in the study are healthcare professionals (nurses and physicians) whose characteristics are different from the characteristics of users in a commercial context. This difference reflects the professionals’ assessment of PU and PEOU as well as on the effect on attitude and intention. Because technology is perceived as interrupting the meeting time with patients, our focus on PU is on how much the HIS allows the tasks to be accomplished quickly. Furthermore, PU measures how much the HIS enhances the quality of care, accuracy of work, and enabling of decisions based on better evidence. PEOU is assessed based on how much the HIS makes it easy for users to achieve their tasks once they use it, whether it is flexible to use and interact with, and how little care and attention it demands.

A successor of TAM research has adopted a simpler model that eliminated attitude as a predictor of IT usage. We argue that this strand in the literature contradicts the basic principles of the original theory—the TRA. Scholars of the TAM have argued that “within organizational settings, people form intentions toward behaviors they believe will increase their job performance, over and above whatever positive or negative feelings may be evoked toward the behavior per se. This is because enhanced performance is instrumental in achieving various rewards that are extrinsic to the content of the work itself, such as pay increases and promotions”. Accordingly, the straight relationship connecting PU, PEOU, and intention shown in the deviating models denotes that the intention to use technology is affected by performance measures beyond the attitude (e.g. like or dislike) toward a particular technology. While this might be true in normal business-oriented
organizations, we argue that it is not necessarily true in healthcare, especially when a major failure factor in HIS projects is healthcare professionals’ resistance to using or adopting the technology. Professionals perceive an HIS as an interruption of their practice,22,24,25 and accordingly, “numerous cases of underuse, resistance, workarounds and overrides, sabotage, and even abandonment” are evidenced.40 Therefore, the present research studies the importance of healthcare professionals’ attitude toward the continuous use of an HIS. It will use the original and rich framework of the TAM as described by Davis et al.28 Although the TAM was originally developed to evaluate users’ initial adoption of newly implemented information systems, several studies have extended the model to evaluate the continuous use of IS in different contexts.33–35,43,44,46 In the context of HISs, we did not find a contradictory argument in the established constructs and relationships in the technology acceptance literature. Hence, we assume that the TAM also applies to the continuous use of an HIS by healthcare professionals, and we test the following hypotheses (see Figure 1):

H1: A positive PU of an HIS will lead to a positive attitude by healthcare professionals toward continuing to use it.

H2: A positive PU of an HIS will increase healthcare professionals’ intention to continue using it.

H3: A high PEOU of an HIS will lead to a positive attitude by healthcare professionals toward continuing to use it.

H4: A high PEOU of an HIS will increase healthcare professionals’ PU of it.

H5: A positive attitude of healthcare professionals toward continuing to use an HIS will lead to a higher intention to continue using it.

**Habit**

A growing body of literature has investigated IS and attributed IS’s implementation success to continuous use rather than initial adoption.43,59–64 While the study of users’ adoption of technology is grounded on theories that rely on attitude and intention to predict actual user behavior (e.g. TRA, TAM, and others), a relatively new stream of the IS literature uses psychology and social psychology and posits that the post-adoptive IT usage decision-making process is influenced by habit.47,61,65–67 For example, using the self-perception theory, Wu and Kuo68 asserted that “IS past usage, habit, has a significant impact on evaluations of usefulness and intention and acts as a principal predictor of future behavior.” In consequence, this research stream has argued that the post-adoptive IT usage decision-making process is a rational process that relies on users’ beliefs about and expectations of

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**Figure 1. Research Model.**
the system that are influenced by their past experiences. In the same vein, Karahanna et al. argued that

Attitudes based on direct experience with an attitude object predict behavior better than attitudes formed based on indirect experience. More information about the attitude object may be available through direct experience than indirect experience. Information derived through direct experience with the attitude object is likely to result in the individual being more able to evaluate the object clearly and confidently.

Habit has been defined and measured differently in the literature. Some researchers have claimed that habit is unconscious; they have defined it as a frequently repeated past behavior measured by the number of times the behavior has been enacted, a learned behavior in response to a specific contextual cue, and an automatic construct that overrides intention and forces a specific human act in response to a previously conducted behavior (subconscious response to a situation). The common element in these definitions is the proposition that habit is automatic and unconscious behavior learned through repetition or triggered by a specific situation. However, another research stream has argued that environmental cues trigger the means to achieve a certain goal and not the behavioral sequence per se. These means are not necessarily the same as those that have been learned. According to Bargh and Ferguson,

Habitual behaviors are automatically linked not to relevant environmental events per se but rather to the mental representations of the goal pursuits they serve. Eventually, the goal structure itself becomes active on the perception of the features of the situation.

Although developing habits in organizational settings is context dependent, "habits are more general in nature, occurring in a variety of settings." While several organizational tasks are repetitive, repetition, depending on the complexity and the nature of tasks, does not always lead to habitual behavior.

In the context of healthcare, developing habitual behavior depends largely on the role of the users and the nature of the tasks they perform. For example, records personnel are expected to perform the same task repeatedly, which would eventually result in performing an unconscious, automatic behavior. However, physicians and nurses are expected to undergo some sort of cognitive effort every time they use an HIS to diagnose a patient's condition or prescribe the right medicine, depending on the patient's medical history. Consequently, physicians prefer HISs that conform to their individual working habits and that are designed to reflect these habits. Based on the above discussion, we argue that in the context of healthcare, habit is defined as a goal-directed immediate activation of a decision-making process involving means of behavior taken in response to a specific contextual cue.

Incorporating habit into the TAM, in the context of healthcare, is a plausible approach to investigate continuous IS use and predict future behavior. It is established in the literature that the learning process at the early stages of IS adoption will be complemented by habitual behavior once users gain the necessary knowledge about the goals of using the IS and the means to achieve those goals. Habitual behavior, in turn, will lead to increased user perception of the IS as being useful and easy to use as users become more familiar with various aspects and functionalities of the system, i.e. habits are useful in achieving a certain goal or accomplishing a certain task depending on the perception of the positive consequences of having performed the same actions in the past within the same environment. This applies to the context of healthcare. Healthcare professionals' evaluation of usefulness is based on how quickly the HIS can allow them to achieve the intended task without interrupting their meeting time with the patient. Ease of use is evaluated based on the system's flexibility and ease of interaction. Habit, furthermore, is activated by the goals of the task for which the system is used in response to a specific patient's case. Therefore, we argue that habits are affiliated with positive attitudes toward the habitual response. Accordingly, we offer two additional hypotheses:
H6: Habitual behavior will increase the healthcare professional’s positive perception of the HIS’s usefulness.

H7: Habitual behavior will increase the healthcare professional’s positive perception of the HIS’s ease of use.

Methods and data

Professionals’ HIS acceptance context

The objective of this study is to investigate healthcare professionals’ attitudes toward the continuous use of an HIS from a TAM perspective complemented by habit. The choice of studying users’ continuous use of an HIS arose from two literature-defined issues. The first is that in the context of healthcare, practitioners’ attitudes toward HISs are largely negative because they see HISs as a threat to their autonomy, a legal threat, and a time-consuming interference that affects their meeting with patients.\(^{19-21}\) The second issue is that such impediments create major barriers to technology acceptance by practitioners. Consequently, research has confirmed that major healthcare IS are considered failures and that healthcare lags behind other sectors in the implementation of technological innovations that could be beneficial if adopted and used appropriately.\(^{22-25,80}\) Thus, we argue that understanding the factors that affect healthcare professionals’ acceptance and continuous use of HISs postulates a rich and valid context for a study that can contribute to the benefit of healthcare professionals and organizations.

Measurement scale

The measurement scale used in this study is adapted from previous literature, mainly research that investigated the TAM in HIS settings.\(^ {28,29,81,82}\) The habit scale is adapted from Polites (2009), who investigated habit in the IT acceptance context. A questionnaire was developed, and items were measured on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The subjects’ native language is Arabic; therefore, the questionnaire was translated into Arabic through collaboration between linguistic professionals and IS professionals. Afterward, the questionnaire was piloted and reviewed by 50 healthcare professionals to refine the items and to clarify the wording and general layout of the questionnaire as described in\(^ {82}\) as well as to confirm that the evaluation measures of PU and PEOU were valid and confirmed by the sample.

Sampling organizations and respondents

The study was carried out in August–September 2017 using a convenience sample of Hakeem HIS users. Subjects were physicians, nurses, and pharmacists who used the system on a daily basis. Data were collected using an online survey and a paper survey. Because data collection involved human participants, the ethical approval for the data collection was obtained from the lead author’s university. The link to the online survey was sent to 500 healthcare professionals who worked in public hospitals. A total of 72 subjects responded to the online survey (14.4% response rate). Because of the low response rate, we disseminated a paper version of the survey to 300 additional healthcare professionals. Of these, 241 paper surveys were returned (80% response rate). After eliminating incomplete surveys, a total of 293 online and paper surveys were retained for the study, which is an acceptable sample size for this study as per Hazen et al. (2015). A majority of the paper surveys were distributed in person by the researchers, who were available to answer questions, address concerns, and clarify items. The sample consisted of 36% physicians, 45% registered nurses, and 9% pharmacists. Among the sample, 49% of respondents were female, and 75% of respondents were less than
40 years old (see Table 1). To examine whether these demographic groups had any effect on the study results, a multigroup analysis was conducted.

**Results**

**Validity and reliability**

Relying on the original TAM, we used six items each for PEOU and PU, four items for attitude (ATT), and three items for continuous IS use. In addition, we used five items for the habit construct. The model was tested for reliability using Cronbach’s alpha and Dillon-Goldstein’s rho, and the results indicate that all the constructs show high and acceptable alpha values above 0.7 (see Table 2).

The research model’s internal consistency and discriminant validity are shown in Table 3. The internal consistency was evaluated by calculating the constructs’ composite reliability (CR) scores, which showed adequate scores greater than 0.70 for all constructs. Reliability was also assessed using the average variance extracted measure (AVE). As illustrated in Table 3, AVE scores of all

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| Table 1. Respondents’ Demographics. |
|-------------------------------------|
| **Gender** | Percentage |
| Male | 51 |
| Female | 49 |
| **Age** | |
| Less than 30 Years | 33 |
| 31–40 Years | 42 |
| 41–50 Years | 18 |
| Above 50 Years | 7 |
| **Experience (Years)** | |
| Less than 5 | 31 |
| 6–10 | 31 |
| 11–20 | 25 |
| More than 20 | 13 |
| **Occupation** | |
| Physician | 36 |
| Nurse | 45 |
| Pharmacist | 9 |
| Data entry | 4 |
| Other | 6 |
| **HIS Experience (Years)** | |
| Less than 1 | 26 |
| 1–2 | 37 |
| 2–3 | 29 |
| 3–4 | 5 |
| Over 4 | 3 |

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| Table 2. Construct Reliability. |
|---------------------------------|
| **Construct** | Cronbach’s alpha | Dillon-Goldstein’s rho |
| Perceived Ease of Use (PEOU) | 0.903 | 0.906 |
| Perceived Usefulness (PU) | 0.929 | 0.932 |
| Attitude (ATT) | 0.902 | 0.906 |
| Intention to Continue to Use | 0.853 | 0.860 |
| Habit | 0.870 | 0.885 |

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| Table 3. Convergent and Discriminant Validities. |
|-----------------------------------------------|
| **Construct** | **CR** | **AVE** | **1** | **2** | **3** | **4** | **5** |
| PEOU | 0.926 | 0.675 | **0.822** | |
| PU | 0.944 | 0.739 | 0.770 | **0.860** | |
| ATT | 0.932 | 0.773 | 0.801 | 0.857 | **0.879** | |
| Intention_Cont_Use | 0.911 | 0.773 | 0.755 | 0.802 | 0.847 | **0.879** | |
| Habit | 0.907 | 0.664 | 0.665 | 0.747 | 0.727 | 0.789 | **0.815** |
constructs show adequate scores greater than 0.50. Furthermore, the square root of the AVE results in Table 3 suggests that the model has good discriminant validity.

**Hypotheses testing**

Structural equation modeling (SEM) was used to test the hypotheses of the proposed research model. SEM is a multivariate statistical methodology used to explain and predict agents’ behavior and performance. A major advantage of SEM is that it allows researchers to assess and interpret complex interrelated dependence relationships among variables. The partial least squares (PLS-SEM) technique was used for data analysis in this study. PLS uses principal components regression for estimation, and it is commonly used in IS research. The statistical package used for data analysis was SmartPLS version 3.2.7.

The study results are demonstrated in Figure 2 and Table 4. The results provide support for all of the proposed hypotheses in the model. Habit appears to be a significant determinant of PEOU and PU in the healthcare context, explaining 44 and 68.8% of their variance, respectively. Furthermore, the research model explains a considerable level of variance (73.4%) for intention to continue HIS use.

**Multi-group analysis**

The users of Hakeem HIS represented in this study’s sample possess different demographic characteristics in terms of gender, age, occupation, and experience. While the study’s results present the effect of habit collectively for the whole sample, there could be statistical differences among these different groups in the sample. Therefore, it is important to conduct a multigroup analysis to determine if there is any significant effect of specific groups in the sample on the relationships among habit, PEOU, and PU. Accordingly, we created groups of users in SmartPLS based on the demographic characteristics of the sample.

![Figure 2. Research Model with Results.](image)

**Table 4. Summary of Hypotheses Tests.**

| Hypotheses | Std. Estimate | P   | Supported |
|------------|---------------|-----|-----------|
| H1: PU → ATT | 0.615 | *** | Yes       |
| H2: PU → CoHIS | 0.270 | 0.001 | Yes       |
| H3: PEOU → ATT | 0.329 | *** | Yes       |
| H4: PEOU → PU | 0.489 | *** | Yes       |
| H5: ATT → CoHIS | 0.613 | *** | Yes       |
| H6: Habit → PU | 0.422 | *** | Yes       |
| H7: Habit → PEOU | 0.664 | *** | Yes       |
The results demonstrated in Tables 5 and 6 show that there is only one factor that represents a significant difference between two groups in the relationship between habit and PEOU. This factor is experience in using HISs, and the groups of users were characterized by one to two years vs. more than two years of experience. In terms of the relationship between habit and PU, multigroup analysis for all the predefined groups showed insignificant differences among groups. This result may indicate that habitual behavior for senior users whose experience in using HISs exceeds two years could have more effect on their perception of the system’s ease of use.

### Discussion

This study examined healthcare professionals’ attitudes toward the continuous use of an HIS. The setting of the study was Jordan, in which the Ministry of Health implemented a nationwide HIS with a major emphasis on electronic health records to replace scattered paper health records. The research model was an extension of the original TAM created by Davis et al., which has been widely applied to explain technology acceptance in healthcare contexts. Consistent with previous research in the literature, attitude and PU were found to be major determinants of healthcare professionals’ intention to continue to use an HIS, explaining 73.4% of the variance in usage intentions. Findings also show that both PU and PEOU influenced attitude toward the use of HISs.

The main contribution of this study is extending the TAM with habit and contextualizing the new model to the healthcare field. Hence, we studied the effect of habit on PU and PEOU evaluation by healthcare professionals to predict the professionals’ attitude and intention to continue using the system. In the context of healthcare, HISs’ PU and PEOU are evaluated according to the professionals’ actual time and effort spent using the system, and how much this usage interrupts their meeting time with patients. The results demonstrate that habit significantly affected PU and PEOU, which ultimately improved healthcare professionals’ attitudes to continue to use the technology. Accordingly, even though healthcare professionals may initially perceive...
HISs as an interruption to their work routines, our results indicate that habitual behavior could significantly improve this perception as users gain more hands-on experience using the system and become more familiar with its interface and how to accomplish tasks quickly. We argue that such habitual behavior would ultimately be reflected in more positive attitudes and better intention to continue using the system.

The paper has implications for both researchers and HIS developers. From a research perspective, the paper extends the TAM by integrating habit to increase its explanatory value, specifically in the context of healthcare. The TAM has been extensively used in studies of IS to predict a user’s adoption and use of new technologies by evaluating the user’s perceived outcomes from the technology. Yet, there is a growing interest in understanding an individual’s continuation of technology use well after its adoption. This is especially important in the context of healthcare, where the use of technology has increasingly become mandatory. Furthermore, in the context of healthcare, the paper shows that habit is not solely automatic or a subconscious tendency to repeat previous behaviors, as claimed in the literature; habit is volitional and part of cognitive decision-making or intentional behavior.

From the managerial perspective of the HIS developers, the findings show that habitual behavior overcomes the crucial causes of an HIS usage failure—professionals’ resistance due to the time it takes and consequently to its interruption of patient care. When a habit is formed, such issues fade. As a matter of fact, users show resistance to change for any differently adopted system. Thus, we suggest that a new HIS adoption requires studying professionals’ work routines carefully, involving users in the design and implementation, and continuously training and supporting the users.

Conclusions and future work

The aim of this study was to investigate the impact of habitual behavior on healthcare professionals’ attitudes and continuous use of a national HIS in Jordan. This research adds to the growing literature on technology acceptance in healthcare by incorporating habit into the TAM and contextualizing the new model to the healthcare field. Our findings demonstrate a significant impact of habit on HISs’ PU and PEOU evaluation by healthcare professionals; habit positively influenced their attitude and consequently their intention to continue using the system.

Healthcare organizations all over the globe continue to implement HISs in an attempt to improve operations and the quality of patient care. Implementing state-of-the-art technology does not always yield fruitful results because of several other factors—mainly users’ acceptance (or lack thereof)—that contribute to the success or failure of the system. Therefore, we investigated the effect of habit on the acquaintance and user acceptance following technology adoption.

Although the TAM has been consistently applied in HIS research, there are several revised models, such as the unified theory of acceptance and use of technology (UTAUT) model by Venkatesh et al., which incorporate additional constructs. For example, the UTAUT incorporates social influence and effort expectancy to explain behavioral intention and address some of the limitations of the original TAM. In addition, there are other relevant theories such as the theory of planned behavior that identify how attitudes toward behavior, subjective norms, and perceived behavioral control influence users’ behavioral intentions. Future studies can investigate HIS adoption in developing countries using the lenses of alternative theories. Previous studies have also investigated the impact of external factors, such as implementation cost, user characteristics, trust, and risk factors, on PEOU, PU, and attitude toward HISs. Future studies can investigate the effect of such factors on HIS adoption in developing countries.

Disclosure Statement

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.
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