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RESISTANCE AND DRIVERS TO ADOPTING THE INTERNET OF THINGS IN HEALTHCARE SERVICES

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ABSTRACT

Adoption of the IoT is crucial in the healthcare industry to reduce congestion, long waiting times, misplaced records, and underemployment. IoT also allows faster and safer preventive care, lower overall cost, improved patient-centred practice and enhanced sustainability. This study aims to achieve two objectives. First, to identify the resistance to adopting the Internet of Things (IoT) in the healthcare sector, and second to determine the drivers that foster the adoption of the IoT in the healthcare sector. Value Stream Mapping (VSM) has been applied to determine the drivers for adopting IoT, while Innovation Resistance Theory (IRT) has been used as an underlying theory for the resistance factors. Data was gathered by distributing questionnaires to healthcare providers and pharmaceutical companies employees in four Malaysian regions and analysed using partial least square structural equation modelling. A total of 77 respondents participated in the survey. The findings reveal that value barriers and risk barriers have a negative impact on the intention to adopt IoT; the usage barrier has a positive impact, but the traditional barrier has no significant impact on adoption. From the perspective of VSM, the visualisation of complex work patterns has a positive impact on the adoption of IoT, while quantifying resources does not have a significant impact. The outcomes of this study are expected to address the issue of the resistance to the adoption of IoT in the healthcare sector and provide empirical evidence to support the resistance concept idealised by IRT. The application of IRT and VSM in a single study provides a new research path in the field of adopting technology.

Keywords: *internet of things, healthcare sector, innovation resistance theory, value stream mapping, healthcare sectors, Malaysia*

INTRODUCTION

Healthcare is the most crucial sector during the COVID-19 pandemic, with employees on the frontline. There are not only doctors but also nurses, midwives, paramedics, administrators, pharmacists and other support personnel. Now more than ever, they are risking their lives to diagnose and treat the daily growing number of patients and developing short-term strategies to combat the spread of infection. They encounter emotional exhaustion that results in remedial mistakes, a lack of sympathy in handling patients, reduced output, and a growing staff turnover rate (Shreffler et al., 2020). A past study also shows that the workplace environment causes healthcare workers to suffer from exhaustion, pressure and depression (Gray et al., 2019). In order to overcome this phenomenon, the healthcare industry needs a digitalised infrastructure and technology-based systems in their operation to reduce repetitive tasks and manual documentation. There are general studies on the use of technologies in Malaysian healthcare, such as Health Information Systems (Ismail et al., 2013; Mohamadali & Aziz, 2017). Specifically, the healthcare sector needs to adopt the Internet of Things (IoT) infrastructure and systems.

IoT has been referred to as an inclusive and broad network of intelligent objects which can auto-organise and share information, data and resources, reacting

and acting in the face of situations and environmental changes (Madakam et al., 2015). Adoption of the IoT is crucial in the healthcare industry to reduce congestion, long waiting times, misplaced records, and underemployment. The adoption of IoT is also expected to improve efficiency (Nazir et al., 2019). A study on the effectiveness of IoT in personalised healthcare systems was conducted by Qi et al. (2017). They concluded that IoT allows quicker and harmless precautionary care, reduces total expenses, provides better-quality patient-centred practice and boosts sustainability. Indeed, the IoT evolution in healthcare systems has attracted attention not only for its various applications, smart devices and systems but also for its methodology (Yuehong et al., 2016), with studies on various technologies used in healthcare services and their security challenges (Bakar et al., 2019; Salih et al., 2019). Previous research on challenges to adopting IoT in the healthcare industry is related to the number of connected devices, data collection, and patient satisfaction (Sivakumar et al., 2017).

Despite various studies on IoT in healthcare, knowledge with regards to the employees' resistance to adopting IoT is still limited. Having considered the Innovation Resistance Theory (IRT) for the theoretical outline, the current study focuses on the usage, value, traditional and risk barriers as the resistance elements, as resistance is the fundamental barrier that needs to be addressed before the implementation of IoT infrastructure and systems. As opined by Heidenreich and Kraemer (2016), understanding innovation resistance will determine the success or failure of the innovation.

In addition, little is known about the drivers that foster the adoption of IoT among healthcare employees. Therefore, this research applies Value Stream Mapping (VSM) in identifying the drivers for IoT adoption from healthcare employees' perception towards the visualisation of complex workflows and quantification of resources. VSM was selected as the driver because it is able to identify non-value, waste and efficiency. It helps to create the flow of products and services and demonstrates process improvements (Morlock & Meier, 2015). Using the VSM method, waste, inefficiency, and non-value-added steps can be identified and explored in a specific process (Tyagi et al., 2015). Although there are many advantages of VSM, its application in research on IoT adoption remains unexplored.

Healthcare systems have only sometimes been able to be fully adopted by their beneficiaries due to the rapid expansion of the IT industry and regulatory disparities in the healthcare sector. In light of this, IoT adoption is a huge need in several industry sectors, particularly in developing countries like Malaysia. Understanding the obstacles to IoT adoption in the healthcare industry was a necessity that caused the development of this study. On the other hand, providing high-quality and economical care is challenging in the healthcare industry. This challenge highlights that the system and the managers have no room for non-value-added activities. Therefore, one of the main goals pursued by the VSM is to improve some Key Performance Indicators (KPI) of the organisation. Although many tools and methods are available to support managers in implementing lean, Value Stream Mapping (VSM) ought to be the first step.

Therefore, this research was conducted with a twofold objective: first, to identify the barriers to adopting IoT in the healthcare sector, and second to apply VSM in determining the drivers that foster the adoption of IoT in the sector. In the fast-paced world of technology, IoT is progressively making an appearance in numerous service sectors and is universally used in the healthcare industry. Health or medical centres are filled with various valuable assets, from knowledgeable people to a variety of physical resources. To ensure that all runs smoothly and optimally, IoT offers a new possibility for healthcare to improve the efficiency and quality of services. In 2015, the Malaysian Ministry of Science, Technology and Innovation (MOSTI) and MIMOS Bhd, embarked on a National IoT Strategic Roadmap for the healthcare industry for an ongoing health monitoring application. This application will be predictable and actionable health and disease model with holistic biological data and social information generated for health optimisation and disease management (National Internet of Things (IoT) Strategic Roadmap: A Summary, 2015).

LITERATURE REVIEW

There is no universal description or interpretation of the Internet of Things (IoT). The concept was introduced over ten years ago, and credit should go to Kevin Ashton (Gabai, 2015), who coined the term to describe the network connecting physical things to the internet. Several studies have been conducted on the

adoption of the IoT in various industries. According to Bi et al. (2014), the evolving IoT infrastructure can effectively help the information systems of next-generation manufacturing enterprises, while many Small and Medium Enterprises (SMEs) can enhance their business processes by using digital technology as an effective approach to disseminating information to their target clients without incurring additional costs (Quigley & Burke, 2013). Nowadays, IoT technology has become more important in the retail industry as its implementation can change customers' shopping behaviour and improve customer interaction. IoT has become a crucial factor for retailers in providing a better customer experience (Balaji & Roy, 2017).

The IoT is gaining popularity at a rapid pace. In coming years, the medical industry is expected to see its widespread adoption and benefit from new eHealth IoT devices and applications. It is expected that healthcare devices and applications will be able to handle sensitive data such as personal health information. Furthermore, such smart devices can connect to global information networks anytime and anywhere (Islam et al., 2015).

An IoT-based healthcare infrastructure would thus act as a network connecting all the services available in performing healthcare tasks such as diagnosis, monitoring, and remote surgery through the internet (Yuehong et al., 2016). Furthermore, wireless technology is commonly used for monitoring equipment, the front end of which is regarded as a network manager. The system will also connect patients to all available community health services, such as clinics, rehabilitation centres, physicians, nurses, ambulances, and assistive devices. A centralised database is linked to the server. The responsibility for intermediary processing can become a proxy for data collection, consolidation, identification of crucial events and development of recovery strategies, all networked to the internet.

Other research has discovered that complications arise as a result of a lack of relevant patient-related medical information (Turcu & Turcu, 2013). Thus, implementing the IoT with tools or similar technology would result in significant improvements in the healthcare system. IoT has the potential to increase people's access to high-quality, low-cost healthcare, as well as minimising medical errors, improve patient safety, and streamline healthcare processes. Several IoT applications, such as Radio Frequency Identification (RFID), and sensors may have a significant impact on the healthcare industry even at the initial stage. In addition, IoT will personalise care facilities and keep track of each person's digital identity (Kulkarni & Sathe, 2014).

Islam et al. (2015) indicate that IoT can be used in many health applications, namely remote health monitoring, emergency notification systems, fitness programmes, chronic disease, and parenting care. IoT is not only focused on achieving more or better services but also on many common procedures that can be performed faster and will maximise the efficiency of healthcare services, e.g., nurses will be able to monitor patients regularly from their desks without needing to go to the patient's bedside to collect the data. Dauwed and Meri (2019) also opined that these health applications can form an interaction between different entities involving humans, such as patients and medical employees, medical devices, smart wheelchairs, wireless sensors, and mobile robots. With many applications offered in the healthcare industry, medical employees will depend on this technology to offer better quality services by reducing medical errors which occur in manually recording patient data and to ensure patient safety as well as to optimise their health processes (Turcu & Turcu, 2013).

IoT also simplifies the possible benefits of achieving a high exchange of information between organisations (Dauwed & Meri, 2019). Consequently, healthcare using this technology in the real-world environment will be able to collect and store data and implement complex applications. In addition, according to Brucher and Moujahid (2017), the widespread use of IoT in healthcare services tends to reduce costs, improve quality of life as well as upgrade the user experience. For example, IoT sensors help to improve quality and eliminate costs when keeping patients under real-time observation based on comprehensive data collection, recording, and analysis. Simultaneously, medical employees will become more experienced as they are actively involved in data collection from the routine examination of the patient's vital signs. From the patients' perspective, they will have a better experience, as they can manage their health by monitoring themselves and communicating with medical employees when necessary. The involvement

of both medical employees and patients helps improve the accuracy of the diagnosis and facilitates the timing of intervention.

Advances in technology and growing demands for healthcare services have made organisations seek solutions to improve the efficiency of their processes to remain competitive. Ben-Daya et al. (2019) assert that the IoT can be the catalyst leading to the fourth industrial revolution, including smart machines, smart products and smart services (to control the quality of the logistics and maintenance). They observe that IoT enablers usually begin with a collection of data using RFID objects and sensors before fixed and mobile networks are used for transmission. They believe that the IoT will help in the further development of lean manufacturing practices. Nevertheless, despite the growing advantages of adopting IoT, the difficulties of this adoption among healthcare employees should be investigated.

Parallel with the above discussion, this study used IRT as an underlying theory to examine healthcare employees' resistance to the intention to adopt IoT. IRT has been applied in many types of research related to resistance to technology adoption; for instance, Chung and Liang (2020) and Kaur et al. (2020) on resistance to adopt mobile payment solutions; Ma and Lee (2019) on online courses; and Chen et al. (2018) on the hydrogen-electric motorcycle. IRT is widely used to develop research models concerning opposition to embracing new concepts or new approaches, usually involving new technology. IRT classifies the resistance into five barriers: usage, value, risk, traditional and image barriers.

From previous studies (Alharbi et al., 2019; Moorthy et al., 2017; Ram & Sheth, 1989), the barriers can be explained as follows:

1. Usage barriers indicate the refusal to accept new ideas or innovations if they are not well-suited to an individual's work or practices.
2. Value barriers show defiance to accept new ideas or innovations if they do not offer strong performance-to-price value.
3. Risk barriers consider the ambiguity of a probable negative impact of the new idea or innovation.
4. Traditional barriers are obstacles to the reluctance of cultures to accept change, including a new idea or innovation.
5. Image barriers are the unfavourable identity associated with a new idea or innovation.

Of the five barriers suggested in IRT, the current study excludes image barriers as unlikely to be an obstacle to healthcare employees' acceptance of IoT. Previous researchers suggest that image barriers are established after consumers have an unpleasant reaction as a consequence of the innovation (Hew et al., 2019). At this point, the image barrier has not yet occurred. To date, few studies have evaluated the hypotheses of our study. Kaur et al. (2020) found that usage, risk and value barriers have an adverse correlation with the intention to adopt mobile payment solutions, while a recent study by Sadiq et al. (2021) discovered that usage, risk, value and traditional obstructions have a negative impact on the intention to purchase new cosmetic products. Joachim et al. (2018) showed that value, risk and usage barriers adversely impact the intention to adopt various new products or services. Moorthy et al. (2017) also found that usage, risk, value and traditional barriers have a significant negative influence on the intention to adopt mobile payment among Generation X. In essence, the literature illustrates barriers increasing resistance to the intention to adopt new ideas or innovations. Building on the above discussion, the following hypotheses are proposed:

H1: Usage barrier has an adverse effect on the intention to adopt IoT.
H2: Value barrier has an adverse effect on the intention to adopt IoT.
H3: Risk barrier has an adverse effect on the intention to adopt IoT.
H4: Traditional barrier has an adverse effect on the intention to adopt IoT.

Among the tools employed for process improvements is VSM. It is a proven tool based on the Lean Management approach that improves product and service flow and other processes (Morlock & Meier, 2015; Seth et al., 2017). The inefficiencies and unnecessary steps that do not bring any added value can be determined and a more defined process can be developed. This approach can increase the transparency of a process and reduce the lead time because it identifies the value-added activities and reduces waste. Shou et al. (2017) offer a procedure to value and analyse waste in four phases: (1) selecting the product family; (2) drawing the Current State Map (CSM) that lists both value-added

and non-value-added activities; (3) drawing a Future State Map (FSM) which includes systematic guidelines for improvement; and (4) achieving the future state from the development of the value stream plan and management guidelines.

The VSM approach has been proven successful in manufacturing (Morlock & Meier, 2015). Tyagi et al. (2015) analysed the manufacture of various gas turbines in the energy sector, and Buer et al. (2018) documented that the focus of lean manufacturing is to eliminate waste in the production process based on the identification of unnecessary activities, process streamlining and development of standard routines. However, this approach is also popular beyond the manufacturing sector. Shou et al. (2017) documented a cross-sector review of the use of the VSM in various business fields, including healthcare, product development, construction and services. Romero and Arce (2017) claim that the popularity of the VSM approach across different industries is due to its ease of adoption and illustrate its application in construction, healthcare, service, transportation, architecture, software product lines, product development, innovation management, services, mining and others.

Previous studies have shown the use of VSM in the healthcare industry, following the lean concept, commonly known as "lean healthcare" (Henrique et al., 2016). This approach is especially useful in two workflows: administration (including information or materials delivery, procurement, inventory management, etc.); and in-patient treatment (the flows involved to improve the efficiency of the in-patient pathway within the hospital, clinic, etc.) (Shou et al., 2017). The emerging use of this approach is indicated by the competitive advantage and easing of pressures in healthcare organisations, especially in the improvement of management efficiency and reduction in in-patient treatment time. Henrique et al. (2016) developed a VSM model for a Brazilian hospital and found that it could determine operational problems and waste that occurred during the patient's treatment. Therefore:

H5: Quantification of resources has a significant influence on the intention to adopt IoT.
H6: Visualisation of complex workflows has a significant influence on the intention to adopt IoT.

Figure 1 shows the conceptual framework for this study based on past studies, IRT and VSM. It depicts that usage, value, risk and tradition are the barrier components to the intention to adopt IoT. On the other hand, the visualisation of complex workflow and quantification of resources are the VSM elements selected for this study mainly due to its usefulness in healthcare sectors (Shou et al., 2017).

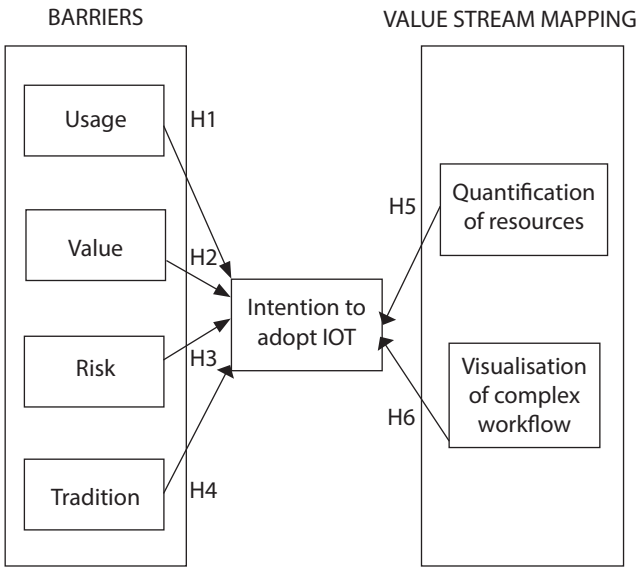


Figure 1 Conceptual Framework

METHODOLOGY

The healthcare sector in this study refers to healthcare providers and pharmaceutical companies as categorised by Bursa Malaysia. Specifically, the scope of healthcare providers here is limited to the operators of healthcare institutions and clinics, while pharmaceutical refers to the companies engaged in the distribution of pharmaceuticals. The respondents for this study are the employees of healthcare providers and pharmaceuticals involved in billing, clerical and documentation tasks. They were selected as their routine work directly involves healthcare operations and will therefore be suitable persons to give an opinion on challenges to the adoption of IoT-based systems. Online questionnaires in English and Bahasa Malaysia versions were disseminated to the respondents under the movement control order, which restricted the researchers from travelling and meeting the respondents face to face. Non-probability sampling was used to select respondents from the list of employees in the healthcare industry, which are confidential and unavailable to the public. Convenience

sampling was based on potential subjects' availability to answer the questionnaire. The minimum sample size was calculated using the 10 times rule by Hair et al. (2011), that is either as 10 times the highest formative indicator employed in measuring a construct, which in this study will be at least 70, or 10 times the highest number of structural paths pointing at a particular latent construct, that is 60. As such, a useable sample of 77 was collected, satisfying both recommendations. Hair et al. (2016) also concluded that 75 observations are sufficient to attain a statistical power of 80% for noticing R-square values of a minimum of 0.25 (with a 5% probability of error) with the maximum number of arrows pointing at a construct. Overall, there was a low response rate to the initial request for data due to the increasingly heavy workload of healthcare staff during the pandemic.

Data was collected from healthcare employees in Kuala Lumpur (representing the capital of Malaysia), Penang and Perak (Northern region), Johor (Southern region) and Kelantan and Pahang (East Coast Region). Representatives from these regions are expected to generate more robust results than focusing on a single state. Analysis was performed by Partial Least Square Structural Equation Modelling (PLS-SEM). This tool can estimate the strengths of association between the latent variables and evaluate the extent to which the model can identify the focus constructs.

The procedure of this study has been reviewed and approved by the research ethics committee of Universiti Tunku Abdul Rahman (U/SERC/173/2020).

RESULTS AND DISCUSSION

The result for the demographic profile is presented in Table 1, after taking into consideration the confidentiality and anonymity of the respondents. PLS-SEM assesses the measurement model following several rules of thumb before evaluating the structural model. According to Hair et al. (2019), there are four pointers in assessing the measurement model: indicator loading, internal consistency reliability, convergent validity and discriminant validity. Table 2 presents the results. The first step is examining the indicator loading, and a value above 0.70 is recommended. A few items which do not meet the criteria were deleted. The second stage, evaluating the internal consistency reliability, was executed by extracting the data for composite reliability and Cronbach's Alpha.

Table 1 Demographic Profile

Item	Description	Frequency	Percentage
Gender	Male	17	22.1
	Female	60	77.9
Age	Below 30 years old	26	33.8
	31 to 35 years old	19	24.7
	36 to 40 years old	17	22.1
	Above 40 years old	15	19.5
Education level	Secondary school	3	3.9
	Diploma	40	50.6
	Bachelor degree	29	39
	Others	5	6.5
Years of experience in healthcare sectors	1 to 5 years	29	37.7
	6 to 10 years	17	22.1
	More than 10 years	31	40.3

The results of composite reliability reported in Table 2 indicate that the values are within the suggested range of satisfactory to good (Hair et al., 2019). Likewise, the value of Cronbach's Alpha met the rule of thumb as more than 0.70. The third step is examining the convergent validity by conducting the average variance extracted (AVE); again, AVE had an acceptable value of above 0.50.

Table 2 Measurement Model Assessment

Items		Rho A	Composite Reliability	Average Variance Extracted (AVE)
Intention to adopt	0.89	0.90	0.95	0.90
Risk barrier	0.82	0.87	0.88	0.63
Value barrier	0.87	0.92	0.91	0.71
Tradition barrier	0.75	0.75	0.90	0.80
Usage barrier	0.83	0.83	0.92	0.85
Quantification of resources	1.00	1.00	1.00	1.00
Visualisation of work	0.76	0.78	0.87	0.69

The final step in the measurement model is to ensure that HTMT is less than 0.85 to establish discriminant validity. The findings presented in Table 3 reveal that all HTMT results are less than 0.85.

Table 3 Heterotrait-Monotrait Ration (HTMT) Results

	Quantify	Risk	Value	Intention	Tradition	Usage
Quantify						
Risk	0.14					
Value	0.22	0.36				
Intention	0.08	0.45	0.50			
Tradition	0.15	0.25	0.13	0.31		
Usage	0.03	0.19	0.44	0.24	0.75	
Visual	0.33	0.30	0.49	0.73	0.26	0.12

The first procedure undertaken for evaluating the structural model is to determine collinearity by using the Variance Inflation Factor (VIF). The findings show that VIF is less than 3.0, which is acceptable (Hair et al., 2019). The highest VIF in this study is 2.494, derived from item R3, the risk barrier. Next, PLS-SEM evaluates the R2 of the endogenous construct: the R2 of intention to adopt IoT is 0.58, which is considered moderate. Table 4 presents the significance value of the path analysis.

Table 4 Path Model Analysis to Test Hypothesis

Path	Mean	Standard deviation	T statistic	P-Value	Remark
Usage barrier -> intention	0.28	0.12	2.46	0.01	H1 Not supported
Value barrier -> intention	-0.35	0.09	3.96	0.00	H2 Supported
Risk barrier -> intention	-0.21	0.09	2.16	0.03	H3 Supported
Tradition barrier -> intention	-0.01	0.10	0.31	0.76	H4 Not supported
Quantify of resources -> intention	-0.13	0.08	1.53	0.13	H5 Not supported
Visual of complex work -> intention	0.44	0.09	4.96	0.00	H6 support

The results presented in Table 4 show that H1 is not supported. Although the usage barrier has a significant effect on the intention to apply IoT, surprisingly, it is in the opposite direction, indicating those usage barriers have a positive and significant impact on the intention to adopt IoT. This result contradicts the findings of studies discussed in the earlier section and signals that IoT is not only for technology-savvy users and that the changes needed to adopt IoT are not a constraint on healthcare employees' intentions. Indeed, this is a positive indicator that healthcare employees have a clear understanding of the new intervention. Hypotheses H2 and H3 were supported, indicating that value and risk are barriers that negatively affect the intention to adopt IoT. The former is consistent with the findings of Kaur et al. (2020) and Sadiq et al. (2021), undeniably indicating that healthcare employees consider performance-to-value as the main constraint on their intention to adopt IoT. Specifically, this implies that IoT is uneconomical and unable to offer extra benefits to reduce time or workload. Another possible explanation is that no clear benefit is derived from IoT as compared to the conventional approach. Risk barriers are the next obstacle, and participants consider the adverse impact of IoT as causing fault, physical damage and entering wrong information. H4 is not supported, that is traditional barriers have no significant influence on the intention to adopt IoT, corresponding to the findings of previous researchers (Sadiq et al., 2021). This scenario denotes that healthcare employees' traditional mindset will not inhibit their acceptance of IoT. It also signifies that they are more flexible in accepting innovation and not rigid in sticking to a routine.

Moving to VSM, the quantification of resources has no significant impact on the intention to adopt IoT; it suggests that the oversupply of inventories will not be a hindrance. In contradiction to this, visualisation of complex workflows have a significant positive impact on the intention to adopt IoT, suggesting that too much documentation, long waiting periods and errors in the information provided are predictors of the intention to adopt IoT. This evidence that VSM can be a predictor of adopting new technology supports Haron and Ramlan (2015), who proved that VSM is a suitable technique when employing transformation for innovation. Ramasamy et al. (2017) also believed that VSM is able to identify enhancement opportunities.

CONCLUSION

This study examines the resistance factors and predictors fostering the intention to adopt IoT in the healthcare sector. The resistance factors were identified using IRT, while the predictors were constructed from VSM elements. In summary, the results show that value and risk barriers and quantifying resources will lower the intention to adopt IoT, while the usage barrier and visualisation of the complex workflow are drivers of the intention to adopt IoT. The result also suggests that the traditional barrier has no impact on the intention to adopt IoT among healthcare employees.

The motivation for this study is to encourage the adoption of IoT in promoting better social well-being and increasing the healthcare services offered to the community. The Sustainable Development Goal (SDG) 9 desires all countries to build resilient infrastructures, promote inclusive and sustainable industrialisation and foster innovation by 2030. Therefore, the adoption of IoT in healthcare services has high expectations of increasing service efficiency. Nevertheless, the United Nations (UN) has documented that there is still a lack of investment in scientific research and innovation in developing countries despite their increasing number of economic infrastructures compared to the global average (United Nations, n.d.-b). The report by the Asian Development Bank has shown that the infrastructures in the Asia-Pacific region are still inadequate. Moreover, the COVID-19 pandemic has shown a critical need for good infrastructure to facilitate smooth services, especially in the healthcare industry. Hence, there is a need for more research in this area to encourage better infrastructure development (United Nations, 2020).

This study also conforms to SDG 11, which aims to make urban and other localities universally secure, resilient and sustainable. The UN reports that a large part of the global population lives in metropolitan areas, and it is foreseen that the proportion will increase to 60% by 2030. The rapid growth of cities has also increased the pressure on public health services (United Nations, n.d.-a) and is an important consideration in ensuring that each individual receives enhanced health services. The impact of the COVID-19 pandemic has increased the pressure rapidly, as healthcare services have become the frontline in combating the pandemic. These organisations need to cater to their existing patients and treat COVID-19 patients with extra precautions. Therefore, the adoption of the IoT in the healthcare services sector is hoped to lessen the weaknesses and problems, especially in the patient's treatment workflow, such as in data registration and management, medicines dispensary, and others. The healthcare sector needs to improve the whole process during this pandemic period to maintain service efficiency.

Malaysia has a serious commitment to implementing the agenda for SDG (SDG 2030) and has launched a blueprint, Shared Prosperity Vision 2030 (SPV 2030), aiming at building fair and equitable development by 2030 at all levels. According to the eleventh Malaysia Plan (2016-2020), the nation is dedicated to ensuring that nobody will be left behind in its efforts to achieve sustainable development. Furthermore, based on the twelfth Malaysia Plan (2021-2025), Malaysia will continue aligning the shared prosperity in economic capabilities, environmental protection, and social engineering. Thus, this study recommends the application of the proposed theoretical framework in the healthcare industry to promote the use of IoT in their services to enhance their efficiency.

Implication

The findings from this study imply that value and risk barriers are the main forms of resistance to the intention to adopt IoT among healthcare employees, which relates to behavioural science implications. In practice, management and administrators should focus on the performance value and negative impact of IoT. Sufficient and appropriate training should be conducted to minimise the fear of adopting IoT. From a theoretical perspective, the current study adds knowledge of the adoption of IoT by including the VSM perspective. It provides a new path for IoT scholars, as compared to other prominent theories such as the Technology Acceptance Model and Diffusion of Innovation. From a scholarly standpoint, this study is able to identify all obtainable recent evidence and future researchers will know the boundaries that affect current published research. The findings will be a reference for future researchers in this area. The integration of technology in the accounting research field will provide new possibilities for multidisciplinary research.

Limitation and Recommendation

The current study faced difficulties in data collection, as at the time this study was conducted, the number of COVID-19 cases were increasing. Healthcare employees have very tight schedules and found no time to participate in this study. It is recommended that future research investigates this area further when more respondents are able to participate. Another limitation derives from the moderate R2 of 0.57 obtained in the study, suggesting other resistance factors and predictors were not investigated. Thus, future research may consider other factors, such as security and safety.

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