Medical Technology and the Fourth Industrial Revolution

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ABSTRACT
The fourth industrial revolution was announced at the World Economic Forum in 2016 and is anticipated to introduce many drastic changes across all sectors. The healthcare system is one area that will be significantly affected as society moves away from the field of domestic to industry towards self-preservation. Many innovations have already been identified and researchers are actively perfecting their algorithms and the application of various concepts in patient care. The paper explores the different aspects of the fourth industrial revolution that are related to healthcare, and how they can be used to help to improve problems faced in the Malaysian healthcare system. Over the past decade, Malaysia has made tremendous strides in this sector and successfully managed to expand access of care and improve sanitary conditions for all residents. At present the leading causes of mortality in the country are non-communicable illnesses. The Ministry of Health reports that there is an increase in the number of patients that are affected by chronic conditions and the healthcare system is currently facing a problem with the shortage of staff. Medical technologies such as telemedicine and sensors that facilitate remote care can aid in addressing this problem; however, there are several factors that either promote or stagnate this process. Using the diffusion of innovation theory, the paper further elaborates on these areas, and provides suggestions on how to overcome some obstacles.

Keywords:
IR4, Malaysia, Innovation, Medical Technology, DOI

1.0 INTRODUCTION
The advent of the 4th industrial revolution, which encompasses a combination of digital, physical, and biological spaces based on communication and information technology is altering the paradigm of the medical sphere. The concepts of wellness and “care in place” are rapidly gaining traction among professionals and venture capitalists and are becoming the objective of health
systems across the world. Medical technology (medtech) is a key aspect of this process as it facilitates remote care through smart devices and can help overcome geographical barriers and other outpatient challenges that adversely influence care. Additionally, the issue of sustainability is one that further elaborates on the importance of medtech as the World Health Organization (WHO, 2018) predicts that more than 20 percent of the global population will be above 60 years. Furthermore, over 60 percent of the babies born today will live above 100 years. Hence, this enhances the burden of non-communicable chronic diseases, and raises the need to assess different factors that may stagnate the adoption of medtech in different communities.

1.1 Fourth Industrial Revolution
Numerous technological discoveries have been made over the past 200 years since the first industrial revolution. The latter is also known as the mechanical revolution and refers to a time when the systems in production were centered on domestic commodities (Lee and Lim, 2017). The second is the energy revolution and facilitated mass production due to improvements in electrical power. The digital revolution followed, which enabled the computerization of data and automation. In 2016, the World Economic Forum announced the forth revolution, and referred to it as technological with the fusion of boundaries of digital space, physical space, and biological space. This revolution is anticipated to significantly impact all sectors through its nature of “super intelligence” and “hyper-connectivity,” which will transform everything and create a more intelligent and interconnected society. This includes areas such as Internet of Things (IoT), artificial intelligence (AI), big data, and machine learning (Lee and Lim, 2017).

1.2 Medical Technology
Several components of the fourth industrial revolution are applicable in the healthcare sector as illustrated through different technological innovations for the treatment and monitoring of patients. Artificial Intelligence, particularly machine learning (ML), will be discussed in the paper as the overall concept of AI is extremely broad. In ML, algorithms have been developed that aid in automated administration of medications, improve the detection of risk factors as well as the benefits of certain treatments, and improve the connection between care providers and patients during outpatient care (Lee and Lim, 2017; Fawaz et al., 2019). The third industrial revolution was accompanied with an increase in big data, and the IR4 in medical technology aims to maximize the benefits of patient information and identify trends that aid caregivers in making the appropriate therapeutic decisions.

There is a myriad of potential benefits that are associated with IR4 and medical technology. However, there is a disproportional use of many innovations as they are limited in developing countries as well as rural populations in developed nations. Malaysia, which is an emerging economy, will be used in the paper to indicate the barriers that limit the integration of beneficial medtech. Numerous medtech companies have emerged in this country; however, the spread and integration of these technologies in the healthcare system as a whole could be improved by addressing different external barriers.
1.3 Problem Statement
Medical technology and IR4 have been rapidly progressing in developed countries; however, emerging economies such as Malaysia have not witnessed the same results. This is essentially worrisome as these communities already have deficits in the healthcare system. Shahar, Lau, Puteh, Amara, and Razak (2019) emphasized on the limited access to healthcare among members of low socioeconomic status in Malaysia, which is in both urban and rural populations. Granted, this problem is also faced in more advanced systems such as the United States; however, the implications on the Malaysian population are more pronounced. Since 1957 there have been numerous strategies aimed at restructuring the healthcare system, and despite the efforts that have been made towards these changes, there is a remarkable contrast in the doctor to patient ratio in the country. In Kuala Lumpur there is one doctor for every 500 patients, whereas in East Malaysia and Terengganu, there is one doctor per 4,000 people (Sohrabi, Tumin, and Osman, 2018). There is also a concentration of private practices and specialists in the urban sectors, which limits the quality of care received in poorer locations. This is indicative of a wider problem in terms of healthcare, as it shows the barriers that negatively impact the adoption of innovations and new medical technologies. Studies illustrate that a significant proportion of the population is impacted by the economic transition, and approximately 70 percent of the deaths in the country are due to chronic disease (Albiman and Suleiman, 2016). On the background of the data above regarding the inequality of access to care, various medical technologies could be implemented to broaden the scope of the healthcare system. However, this has not been the case, and there is a need to identify the challenges that affect the participation of Malaysia in the IR4 and adopting medical technologies that will benefit all members of the community.

2.0 LITERATURE REVIEW
There are several factors that may impact the adoption of medical technology, and Cresswell and Sheikh (2012) state that the problem stems from a range of social, technical, and organizational issues. The authors analyzed 13 systematic reviews, which showed that the different factors affecting technological adoption are inter-related and there is a need for a balanced and strategic approach towards their resolution. This will ensure that there are no unintentional consequences that subsequently harm or pose a threat to the patients. The diffusion of innovation theory (DOI) which was developed by Rogers in 1962 is a sociological theory that describes the processes involved in a product gaining attention and consequently widespread use or adoption. As posited by Rogers in 1962 the adoption of a new idea does not randomly occur within a social setting; rather, involves a process of individuals with certain characteristics adopting the product early (Pashaeypoor et al., 2018). Hence, the discussion will assess the characteristics of different groups within the Malaysian community and determine how these individuals will hinder or facilitate IR4 and its role in the healthcare sector. The theory posits that there are five categories that are used to classify the adopters and the majority of the population is within the middle category (Singhal and Dearing, 2006). These five include innovators, early adopters, early majority, late majority, and laggards.

The innovators are venturesome and willing to try new innovations, and there is minimal effort required to convince them to use a product. On the other hand, the early adopters are the frequently individuals in leadership roles, are highly opinionated, and are often aware when need is necessary.
The early majority are more pessimistic and require evidence before the adoption of innovation, while the late majority skeptical and will only use something that has been tried and proven to be effective. Finally, the laggards are the conservatives and are tightly bound to the status quo and comprise the hardest people to convince about innovation. The theory covers the different stages that an individual in each of the groups goes through before adoption of innovation, and these include awareness of the necessity for innovation, the decision to reject or adopt an innovation, initial usage of the innovation and its testing, and its continuous use. Social systems as well as the innovation that is introduced interact differently based on the circumstances. Hence, in the context of medical technology, these stages will be analyzed within the Malaysian community. It is also worth mentioning that there are five factors that influence the adoption of innovation and these include relative advantage, which accepting the innovation as superior to the standard that it is replacing. Secondly, compatibility, which is the consistency of the innovation in relation to the experiences, values, and needs of the potential adopters. Thirdly, complexity and the difficulty in its use or understanding, and fourthly triability, which is the extent to which people can try the product before making a commitment (Lien and Jiang, 2017). Finally, observability, which is the ability for the innovation to provide tangible results.

The DOI theory is extensive and has been successfully applied in many diverse fields, including healthcare. In case of IR4 and medical technology, the theory will shed light on ways that the adoption of beneficial technologies may be accelerated among all stakeholders. According to Kaminski (2011), the most successful adoption of healthcare programs occurs on the background of an in depth understanding of the target population, and the benefits that they can derive from the available technology. Furthermore, the different potential barriers to adoption will be identified regarding both medical technology as a whole as well as in Malaysia. The theory will only be applied to technologies that are related to the treatments and management of patients.

3.0 DISCUSSION
3.1 Medical Technology
One of the major problems associated with the healthcare system is inequality and the lack of access affecting people of lower socioeconomic status or those located in in remote geographical location. As indicated above, the disparity of healthcare services is observed even in well-developed healthcare systems. For instance, the Government of Canada (2019) states that the majority of the inequalities in the healthcare system are a result of groups and individuals of political, social, and economic disadvantage. These disparities affect community members in their healthcare outcomes, quality of life, and overall life expectancy. In the United States, Kaiser Permanente (2019) noted that over 28 million Americans are uninsured, and this number is further enhanced after including those who are under insured, or in debt due to high medical bills. The problem is more significant in emerging economies, as stated above, the ratio of physicians to patients in Kuala Lumpur, is 8 times better than that in the rural areas. This presents numerous opportunities in the treatment and management of patients through medical technology.

Telemedicine, which is broadly defined as the utilization of technology for the provision of patient care and sharing of information, overcomes many of the barriers mentioned above. Despite the
concept dating back to the 1800s following the invention of the telephone by Alexander Graham Bell, developments in the third revolution have allowed emergence of technologies that facilitate better care processes (Heston, 2018). The improvements in video and audio quality, internet speed and access, allow specialists to communicate seamlessly with patients without the confinement of geographical location. According to Kane and Gillis (2018), telemedicine in the modern setting will have a more significant impact not in the diagnostic process but in the monitoring and management of patients with chronic illnesses. However, the authors state that the use of this technology remains an exception rather than the rule. Specifically, approximately 11.2 percent of physicians in the United States work in settings that have telemedicine services (Kane and Gillis, 2018). Additionally, Asiri, AlBishi, and Househ (2018) conducted a systematic review that showed despite its limited use, telemedicine has substantial benefits to surgical care.

Artificial intelligence, particularly machine learning, have continued to advance, and provide care providers with more efficient therapeutic tools. IBM Watson Genomics (2019), is an ideal example of the integration of genomic based tumor sequencing with cognitive computing. This approach enhances the efficiency of detecting cancer in the early stages, and as the population ages, the incidence of cancer will continue to increase, and enhance the relevance and implementation of such technologies. Machine learning is also being applied in drug discovery and providing personalized therapies by companies such as Berg and P1 Vital, which has recently created an algorithm that aids in understanding the efficacy of depression treatment (Abdul and Kenny, 2019). It is also worth mentioning that there are other similar algorithms that are being applied in other therapeutic areas, which will help identify effective medication and reduce adverse reactions or anaphylaxis. The long-term benefits of personalized drugs and sequencing technologies is a reduction in the overall expenses of medication, making them more accessible to a broader demographic. Furthermore, personalized medicine provides physicians the ability to combine individual records and analytics with treatment. At present doctors are restricted to a specific set of diagnoses and treatment guidelines that are neither universally nor equally effective on all patients. Hence, all healthcare systems across the world should begin moving towards this aspect of medicine.

3.2 Forth Industrial Revolution
As illustrated above, the fourth industrial revolution has introduced several channels to advance the healthcare system and patient care. Lee and Lim (2017) evaluate the fourth industrial revolution and its implications on home care for an ageing population. The authors present what is known as the “tipping points,” which were discussed at the World Economic Forum (2016). These include statistics such as: ten percent of all people wearing clothes will be connected to the internet, and 90 percent of these individuals will have free or unlimited storage. The forum also discussed the emergence of robotic pharmacists, and the fact that over a trillion sensors will be connected to the internet as a tipping point (World Economic Forum, 2016). These points are estimated to come to fruition by 2025, which creates opportunities for the Internet of Things within the healthcare sector. In the latter part of the 2020s, intelligent sensors are expected to have materialized, which will make the development of a “connected home” and a human centered healthcare home a reality (Lee and Lim, 2017).
The industrial revolution has been accompanied with the introduction of an integrated care paradigm as there is a transition from the patriarchal model. In this regard, IR4 has transformed the manufacturing and the video consumption products that are available (Chute and French, 2019). Healthcare providers as well as governments across the world are actively attempting to improve their systems through innovations of the IR4. For instance, in the United Kingdom, there are numerous policies that encourage research on technologies that advance personalized care and shift health resources out of the traditional hospitals and into the community (Chute and French, 2019). The governance of healthcare quality is a major area of concern in assessing the implications of IR4 as it is the major barrier or facilitator of successful distributions of these programs within the community. Brown, Dickinson, and Kelaher (2019) conducted a study to elaborate on the corporate governance of healthcare quality and how this aspect can influence the adoption of new technologies or innovations. The authors found that boards in Australia and other developed economies were aware of the importance of medical technology and the need for its introduction within the system. However, one of the major areas of concern, which were also influential on adoption is the financial restraints (Brown, 2019). Despite the potential benefits associated with medical technology, many of the proposals are theoretical and would require billions of dollars in investment and take years before they are approved for safety.

As technology continues to become an integral component of the healthcare system, people are still skeptical of the benefits and the future of this revolution both from the perspective of the patients, and the professionals. With regards to the former, Harari (2016) states that medical progression is leading to alteration of biological and physiological norms. Hence, this creates a fear of losing humanity, and leads to hesitation in allowing the efficient inclusion of different technologies into the healthcare system. On the other hand, Topol (2019) addresses the issue from the physicians’ viewpoint as many of the activities that were previously performed by clinicians can now be done by computers. Machine learning algorithms exist that can interpret diagnostic image at the same level or better that experienced radiologists (Topol, 2018). Therefore, many professionals in this field are worrisome about their occupational status and the future of the profession. On the other hand, there are also general concerns within the field as mistakes by physicians affect a limited number of patients; however, if some faults occur with the algorithm, this will potentially harm thousands or even millions of people.

However, as indicated above, the potential benefits of this revolution are extensive to the extent that there are numerous private and government organizations that are willing to remain in pursuit of their application. Jung (2019) illustrates how these benefits to the community can begin at an elementary level through applications such as eight cubs which aims to ensure that all people drink sufficient amounts of water. However, this product also raises another important question as it is not guaranteed that a mere reminder through an application will lead people to drinking more water. On the other hand, the benefits are more distinct in other areas of care such as reminding patients when to take their medication. Jung (2019) also provides insight on big data and states that one person who is born today will produce more that 1 million gigabytes of data in their lifetime. This is a concept of interest for many of the larger organizations such as Deloitte (2017) who mentioned the benefits of big data and medical technology, and how it is a necessity with the rise in the prevalence of chronic conditions.
3.3 Malaysian Healthcare System
To understand the implications of IR4 in the context of healthcare in Malaysia there is a need to evaluate the healthcare system and its unique attributes. Malaysia is a federation that consists of 2 territories and 13 states that are governed by a parliamentary democracy. The head of the government is the Prime Minister, and there is a constitutional monarch who is elected by the Sultans. The community is multicultural, and Sunni Islam is considered the official religion of the territory. The world bank classifies the country as upper middle income, and both the economy and the society have been vastly transformed by an economic growth in the latter part of the 20th century (WHO, 2019). The population is estimated to be 28 million and approximately 70 percent of the residents reside in the urban area. This has led to a highly developing medical system, with good sanitation and access to clean water and other basic resources. Similar to other developed healthcare systems, non-communicable diseases are the leading causes of mortality in the country.

The governance and organization of the healthcare include government and tax funded health services, which are both hospitals and primary care centers (WHO, 2019). However, in the past decade there has been a growth in the private sector, which mainly include local clinics by physicians and larger hospitals in the urban area. The services that are provided in the public sector are offered through the Ministry of Health and its district, state, and central offices (WHO, 2019). The ministry also regulates the activities of the private sector as well as the food safety, and pharmaceutical industries. Health care officials that are looking to practice in Malaysia are mandated to register with professional licensing bodies (WHO, 2019).

The healthcare expenditure accounts for 4.6 percent of the GDP, and there are more than 2,000 small community clinics and 802 centers. Numerous efforts and programs have been made to expand services to all population. Another focal area among policy makers is the emphasis on the wellness along with disease attribute of a patient. Although there has been extensive development of public care networks, one of the major strains affecting them is the shortage of staff. The main thrusts of the healthcare system can be summarized as follows: increasing the surgery day centers, improving the specialty care in larger hospitals, and increasing the number of high end private medical facilities to cater for the tourism market.

3.4 Diffusion of Innovation Application
The diffusion of innovation theory (DOI) provides the appropriate theoretical framework to evaluate the Malaysian healthcare system, and how concepts of IR4 and medical technology apply to this setting. With regards to the latter, the appeal of this approach stems from the inequality that exists within the system as not all people have the appropriate access. There are several factors that affect this area, and Malaysia is mainly impacted by the shortage of staff in some locations. Therefore, the adoption of medical technology such as telemedicine will aid in ensuring that specialists are available in a broader range of locations. In line with the diffusion theory, telemedicine presence a relative advantage in comparison to practices that are currently applied. For instance, individuals that live in East Malaysia at times need to travel long distances to meet the appropriate specialist (Fun et al., 2019). Furthermore, the data indicates that the highest
shortage is among the nursing staff members, which is a similar trait in the majority of healthcare systems.

Drennan and Ross (2019) report that the global shortage of nurses is predicted exceed 10 million by 2030. At present, the nurses have to work longer hours and manage more patients, which leads to stress and subsequently reduces the quality of patient care. Therefore, medical technology contributes to better conditions for both the professionals and the patients. The Malaysian healthcare system stands to benefit from innovations that help overcome the deficit of staff members, which positively influences the likelihood of adoption. The technologies such as machine learning, and the use of big data have also been found to be promising and will potentially alter the process of care for different patient groups. However, this technology is will face more challenges in adoption within the Malaysian healthcare system as well as others across the world. As stated by Scott Kruse (2018), the use of these methods is still restricted, and many of the proposed interventions are still within the trial phase. This aspect will affect the number of early majority adopters, late majority adopters, and laggards as there is limited evidence or statistics to support many of the claims.

Novel technologies may also face challenges because of complexities and the skepticism that physicians and the healthcare system as a whole have in introducing change. In cases of the remote areas, which are occupied by 30 percent of the population and have a greater need for the technology, the diffusion of innovation faces several barriers. Populations in these areas are more traditional and have lower familiarity with technology. Topol (2018) emphasized on the importance of the human element in medicine, and how this aspect may slow down adoption of technologies as patients may have difficulties interacting with a non-human caregiver, in this case an algorithm. This problem is further increased among the older population and individuals that are less familiar with advanced technology. The diffusion theory emphasizes on the importance of audience awareness, and in the case of Malaysia, there is a need to select technologies start with technologies that human controlled and slowly transcend towards further automation. Granted, in urban areas such as Kuala Lumpur, automated strategies may be accepted and integrated faster.

The fourth industrial revolution in Malaysia is also influenced by different factors, and there are several areas that may be improved to further enhance the progress that has been made in the healthcare sector. The “tipping points” that were discussed at the World Economic Forum emphasize on the importance of devices and internet connection. A survey that was conducted by the Malaysian Communications and Multimedia Commission (MCMC) found that 61 percent of the population uses the internet. The smartphone was identified as the device that most frequently used for accessing the internet (MCMC, 2018). Specifically, the survey indicated that the nine of the ten participants used their smart phone to go online.

These traits illustrate the barriers that affect the diffusion of new technologies in Malaysia through the fourth industrial revolution. In comparison to other countries, more than 88 percent of the residents use the internet and by 2022, estimates suggest that 310 million Americans will be active internet users. Hence, this environment enhances the impact of the fourth industrial revolution on the community members, while it acts as a barrier of infusion in places such as Malaysia. Under
these circumstances, the access to novel technologies and procedures will be available to the same people within the urban areas, and not provide a solution for other groups. The restriction in technology would also impact the trials of the different technologies as this limits the ability for different groups to experiment and test the innovation before making a commitment. Hence, this should be a priority for the government as it will impact the development of the healthcare system and the quality of life.

Another area that is also affected is that of home care as the IR4 has led to the emergence of sensors and transferal of care elements to the community (Lee and Lim, 2017). This suggests that the diffusion of medical technology in Malaysia should begin with engagement of local authorities and the promotion of innovations that maximize the benefits of modern technologies. The United Kingdom is an example in this aspect as it facilitated diffusion of new innovations through accommodating policies and actively supporting stakeholders engaged in research through grants and providing access to important data (Deloitte, 2016). Therefore, the government and the Ministry of Health have a central role in the impact of IR4. As illustrated by the progression of the medical system in Malaysia, the government is committed towards initiatives that enhance the access and the quality of care. Therefore, approaching the importance of IR4 from the perspective of healthcare rather than that of communication and technology may be beneficial to the engagement in this process.

As previously stated, the Malaysian healthcare system experienced exponential growth in the past decade; however, much of the efforts were dedicated towards providing access and strengthening the network of care facilities. The Ministry of Health has been successful in broadening the access towards health promoting resources such as clean water. There is a need for more efforts to be dedicated towards the technological aspects of the public healthcare system. It is worth mentioning that steps in this direction have been taken in the private healthcare sector as the government aims to attract foreign patients through the medical tourism sector. However, this objective is counterproductive as it increases the prices of care services and make them less affordable for the local patient demographic.

Epidemiological studies also show that non-communicable diseases are the leading cause of death in Malaysia, which supports the diffusion of medical technology as there is a growing patient group that requires monitoring (WHO, 2019). The increase in the patients with chronic conditions continues to have an economic burden on both the patients and the public healthcare system. As indicated above, the costs of research and attaining the appropriate evidence pertaining to the care are some of the limiting factors for the diffusion of innovation. However, on the background of the morbidity and mortality statistics, investing in the research and innovation of management and monitoring may be the more economically appropriate strategy.

The WHO (2015) conducted a health technology assessment on Malaysia, and the team designed a tool that was aimed at providing updates on the latest developments and educating professionals on the appropriate strategies to implement. The tool discusses a broad range of issues that also include ethical and legal aspects. This approach aligns with the facilitating factors that are suggested through the diffusion of innovation theory, which is the importance of the target
population understanding the innovation (Scott and McGuire, 2017). Healthcare professionals are a central part in the innovations of this sector, and it is essential to ensure that they understand their functionality and ways they can use them to provide better quality patient care. Healthcare professionals should be targeted as the early adopters and, provided with sufficient knowledge to promote the use of the technology and explain the benefits to their patients.

4.0 RECOMMENDATIONS

The literature illustrates the benefits that exist in all the stakeholders working together in Malaysia to improve the effectiveness of medical technology and ensure that the revolutionary technological discoveries benefit the community. The process should begin from the authoritative body, as the Ministry of Health must implement policies that facilitate more research and improve the transition of these technologies into the care system. In fact, the involvement of the ministry should begin from the educational sector by encouraging curricula that incorporate medical technology and ensure that the doctors of tomorrow are aware of the best practices to help patients. It is also essential for the Ministry of Health to collaborate with other departments such as the Malaysian Communication and Multimedia Commission to help realize common goals.

The healthcare professionals are another important group of stakeholders that will facilitate the diffusion innovations. Firstly, clinicians should actively collaborate with the researchers and create open channels of communication regarding ongoing research and application in the clinical setting. Similarly, to the progress that was made in expanding the networks of hospitals in different communities, there should be networks formed between clinicians and researchers. Strengthening these relationships will also help to overcome some of the barriers that were mentioned above, regarding the resistance by caregivers and the potential concerns regarding their jobs. As numerous studies show, the complete replacement of healthcare professionals by algorithms or computers is something that is not anticipated in the near future. The human component of care cannot be replicated by a machine, and there are many cases when doctors use other parameters outside of the disease to aid with their diagnosis, treatment, and communication with the patient. On the other hand, many patients require the compassion and empathy of a human, especially those suffering from chronic terminal conditions. Therefore, it is important to improve the role of experts in both the development and promotion of beneficial medical technology.

The patient population with chronic illnesses is expanding in Malaysia, and there is a need for solutions that promote efficient outpatient management. Telemedicine, one of the oldest aspects of medical technology, is an approach that will significantly enhance the quality of care in Malaysia as it not only provides all members of the community access to specialists, it also facilitates follow up regarding the interventions that have been implemented. This includes determining the efficacy of medication, the need to change prescribed drugs, and providing the patient emotional support and motivation to continue therapy. Studies indicate that the discontinuation of medication is one of key contributing factors to adverse patient outcomes on the background of chronic illnesses such as diabetes. Hence, there should be further investment by public care providers in creating more facilities that are equipped with telemedicine resources and providing specialists incentives to gain qualifications in this area.
5.0 CONCLUSION

The fourth industrial revolution will have some of the modest impactful implications to humanity, particularly through the healthcare sector. Advancements in areas such as machine learning, video and audio quality, and computerized drug synthesis are enhancing the efficiency of managing chronic conditions. The Malaysian healthcare systems has seen many developments in the past decades, which involved expanding access to more community members. However, the next phase of this growth should include medical technology, as this field helps addresses many challenges that are currently faced today. These include shortage of staff, inequality of access, and expanding demographic of patients with chronic conditions. Adopting concepts of the diffusion of innovation theory will help introduce different technologies more efficiently and overcome potential barriers. The paper illuminates on the opportunities presented by personalized treatment, telemedicine, and algorithms for automated monitoring and administration of patient medication. The Ministry of Health and professionals in the sector have a central role in facilitating the adoption of innovation.

References


