

Key Factors Affecting E-Health Adoption among Young Adults in Malaysia

Haneffa Muchlis Gazali

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Abstract

Introduction: The technological advancement has changed the way people live their life such as communication, travel, learning and shopping. The health sector was also influenced by the technological changes. Objectives: The objective of this study is to develop a model on consumer adoption on electronic health (e-health) in Malaysia. Methods: Extending the Technology Acceptance Model (TAM) with Personal Innovativeness in IT and Social Influence. This paper presents the conceptual foundation on the adoption of e-health among young adults in Malaysia.

Index terms— e-health, TAM, Malaysia, Personal Innovativeness, Social Influence.

1 Introduction

Technological landscape often changes very rapidly. Human personal life is highly dependent on the technology that being developed. This technological advancement has changed the way people live their life such as the communication, travel, learning and shopping, just to name a few. The technological changes also influence the health sector is. The innovation and deployment of technology in the health sector improves the service delivery and outcomes [1]. Prior research has conceptualised the electronic health as all services, a system and activity relating to patient health and supported by technology [2]. The use of e-health application is more prevalent. For instance, researchers have discovered that people are using the e-health application to monitor their health and wellness, to monitor disease and to increase their fitness [2]. Malaysia, like many other developing countries has invested a substantial amount of resources in the ehealth system. For instance, in the 11th Malaysia Plan (2016-2020) the Malaysian Government focused to develop the National eHealth by strengthening the current system with a robust ICT system [3]. In recent years, researchers have shown an increased interest in health technology adoption [1], [4], [5]. In as much the prior research confirms that positive impact of e-health technology, the researchers also highlighted the subtle nuances of the factors that lead to the adoption and utilization of e-health technology especially in developing countries [1]. Several attempts have been made in the context of Bangladesh, German, India and China [4][5][6] [7]. Moreover, most of the empirical evidence come from developed countries like the United States, Canada and Australia [8].

Despite the importance of health technology benefits, there has been little discussion about e-health adoption from Malaysia perspective.

According to the Department of Statistics Malaysia (DOSM) [9], for the third quarter of 2019, the Malaysian population was 32.63 million in estimation. A survey conducted by the DOSM in 2018 revealed that around 81.2% of individuals aged 15 years and above in Malaysia used the internet [10]. The main activities of internet usage by individuals are like participating in social networks, finding information about goods and services, downloading software or applications, telephoning over the internet and many more. Furthermore, approximately 98.2% of the household in Malaysia access the ICT via mobile phone. This is an indication that a mobile phone is one of the most important devices in the modern life of which indirectly increases people health care via the e-health application.

The main aim of this study is to develop a model of consumer adoption on electronic health (ehealth) in Malaysia. Thus, this study seeks to obtain the key factors affecting e-health adoption among young adults in Malaysia. This conceptual paper offers a conceptual framework from the extension of the Technology Acceptance

Model with other two extended variables, which are the Perceived Innovativeness on IT and the Social Influence. This paper is composed of four distinct sections. This paper begins with the introduction. It will then go on to the discussion of Technology Acceptance Model (TAM), Personal Innovativeness and Social Influence. Next is the discussion on the conceptual model followed by the discussion on reshaping Takaful and insurance industry with e-health application. The final section concludes the study and provides the implications, limitations of the study and recommendations for future research.

2 II. Technology Acceptance Model (tam)

The Technology Acceptance Model (TAM) was introduced by Davis in 1989 [11]. In his seminal paper, Davis establishes a better measurement for predicting and explaining. TAM was considered as the modification of TRA Ajzen and Fishben [12]. According to TAM, there are two important antecedences which explain the determinants of system in use; the Perceived Usefulness (PU) and the Perceived Ease of Use (PEOU). A large and growing body of literature has widely documented the TAM model that explain the ICT adoption such as [4], [6], [13]-[16].

3 a) Perceived Usefulness (PU)

TAM proposes that PU influences attitudes and sequentially influences the behavioural intention. The Perceived Usefulness (PU) refers as the degree of a person's belief in using a particular system that it would enhance their job performance. There is a large volume of published studies describing the role of PU towards the ICT adoption [14]- [18]. For instance, Rouibah, Ramayah and May [15] utilised PLS to understand user acceptance of internet banking in Malaysia. Their study found that PU is one of the key determinants that explained behavioural intention to use e-banking in Malaysia.

Similar finding was found when Kallanmarthodi and Vaithyanathan [19] tested TAM among the e-banking customers in Coimbatore City, India. Thus, in the context of e-banking adoption, PU was identified as a vital determining factor on the adoption of a particular system.

Although, several lines of evidence has reported the role of PU in shaping behavioural intention prior studies have failed to demonstrate any convincing evidence on the role of PU towards the adoption of e-health especially from the developing countries like Malaysia. By far the most recent evidence conducted in Malaysia is a study by Saare, Hussain and Yue [13], yet the sample of their study was among the Iraqi Older Adults. Thus, it is relevant to study the role of PU in the context of e-health.

4 b) Perceived Ease of Use (PEOU)

Perceived Ease of Use (PEOU) refers to the degree which a person believes that using a particular system would be free from effort [11]. Several lines of evidence suggest the importance of PEOU of acceptance. For instance, Jackson and Yark [20] confirmed that PEOU has positive relationship towards the acceptance of information technology. They discovered that highly innovated individuals tend to embrace change. A recent study in Bangladesh by Hoque et al. [4] found that PEOU is one of the vital components on the adoption of e-health among patient's in Dhaka City. Hoque extended their analysis and investigated the gender differences towards the intention to utilise e-health. They found that male and females have different perspective on e-health adoption, where the male shows that PEOU has stronger influence on e-health adoption. Thus, they suggest that gender also has significant influence on technology adoption. Contradicting with the previous findings, another line of evidence from Bangladesh revealed that the PEOU does not influence the adoption of e-Health.

Khan et al. [6] aimed to investigate the factors that influence the African expat's intention on e-health in China. Khan confirmed previous findings by Hoque [4] when they validated that TAM is a strong predictor on the e-health adoption among the African expats in China. Khan [6] findings are slightly different from the previous findings, as they revealed that PEOU was less essential compared to PU in users acceptance of technology. PEOU is also captured in Arkorful et al. [1] findings in their study of role of electronic health among health practitioners. The health practitioners feel comfortable and convenient by utilising the health technology, thus the PEOU is found to be the determining factor that serves the practitioners to use electronic health.

5 c) Personal Innovativeness (PI)

Agarwal and Prasad [21] in their seminal paper on A Conceptual and Operational Definition of Personal Innovativeness in the Domain of Information Technology has conceptualised the definition of Personal Innovativeness (PI) as the willingness of an individual to try out any new information technology. They emphasised that in the technology acceptance behaviour via its relationship with beliefs or perceptions manifested the influence of PI. In other words, [21] it symbolised PI as risk-taking propensity that exists in particular persons and not in others. Research discovered that the PI plays an important role in behavioural intention. For instance Lu [22], stated that a higher PI among individuals will lead to a more positive beliefs on the adoption of target technology.

There are a number of large cross-sectional studies suggesting the PI in technology adoption. Both theoretical and empirical evidence revealed the importance of PI in the innovation adoption process [23]. Recent study by Wijesundara and Xixiang [24] discovered the role of PI in technology in predicting the social networking site acceptance. They highlighted that prior study failed to prove the function of PI in SNS acceptance. The most

important findings is PI positively influences PEOU of SNS. By utilising Unified Theory of Acceptance and Use of Technology (UTAUT), Jackson, Yi and Park [20] also shown that highly innovate people have higher tendency to embrace change and have more positive feelings of PU, PEOU and Perceived Behavioural Control (PBC) towards innovation.

6 d) Social Influence

The terms of social norms in this study refers to subjective or normative pressure. Fishbein and Ajzen [25] defined social norms as individual's perception of the likelihood that the potential referent group to her/him think that he/she should or should not perform behavioural in question. Previous studies confirms the role of social influence as a motivation factors for the consumers to adopt new technologies [26]. However, studies have found mixed results on social influence as predictor of intention to use. For instance, Cheung and Lee [27] proposed a theoretical model for online social network. They discovered subjective norm and social identity determine the decision to employ online social network. In the context of online shopping, Shabrina and Zaki [28] revealed that subjective norms positively influence the intention to use online shopping. Furthermore, they found that the higher the subjective norms, the higher the effect towards intention to use online shopping.

In a study conducted by Ramayah, Rouibah, Gopi et al. [29] using a Decomposed Theory of Reasoned Action in determining intention to use internet stock trading among the Malaysian investors discovered that subjective norm has a significant direct relationship with intention to use stock trading. More importantly, social pressure could enhance the intention to use the internet stock trading among the investors.

7 III.

8 Conceptual Framework

9 Reshaping Takaful and Insurance Industry with E-health Application

The adoption of Internet of things (IoT) nowadays could improve the current conditions or perhaps could assist in solving the dilemmas in coping with the rising number of people and ensuring that they are in the state of good health and are protected [30].

Perhaps, the advancement in health technology could shape the Takaful or insurance industry in providing a new business model, commercial partnership and consumer relationships [31]. The advantages of the convergence of health technology present a great potential for both the insurer and the insured person. With technological advancement, the professional can access the data that could improve the health and social care of their clients. On the other hand, the insurer, the industry players and the Takaful or insurance industry may provide better services based on the needs of the customers, provide incentive and engagement programs that improve the quality of life of the insured [30].

The big tech players in the industry eagerly involved in providing innovative health technology ecosystem. For example, Google builds certain applications like wearable with health tracking such as phones, tablets or smart watches [30]. All these devices are part of non-invasive underwriting evidences that provide sources of data that can improve people lifestyle and the habits of the users. Google claims that the built in features on such devices could assist in early detection of contagious disease or other malady. At the same time it aims to empower people in managing their disease better [30]. The weaknesses of previous Takaful and insurance business model is low adoption rates due to the products not relevant and accessible to the customers [31]. Thus, the service provider and the industry player should promote and ensure that the Takaful and insurance products and services are more appealingly.

V.

10 Conclusion

This study proposed a model on consumer adoption on e-health and discussed the key factors affecting e-health adoption among young intellectuals in Malaysia. This study used the extended version of the Technology Acceptance Model as the underpinning theory to explain better the e-health adoption. The discussion of this paper reveals that there are four important factors leading to the e-health adoption among the young adults in Malaysia such as perceived usefulness, perceived ease of use, personal innovativeness and social norms. Taken together, these findings suggest roles for the mentioned variables in promoting e-health adoption among young adults. Before this study, evidence of TAM was purely anecdotal. This study has been one of the first studies to compare the experience of e-health adoption in Malaysia. In addition, this study is relevant to both the practitioners and policy-makers. This study extends our knowledge of e-health adoption among young adults in Malaysia. Despite its conceptual nature, it would be interesting if further studies could establish empirical

evidence on the relationship between the mentioned variables towards e-health adoption.

[Financ et al. ()] , Financ , Serv , Mark . 10.1057/palgrave.fsm.4770120. 2004. 8 p. .

[Agarwal and Prasad ()] 'A Conceptual and Operational Definition of Personal Innovativeness in the Domain of Information Technology'. R Agarwal , J Prasad . doi: 10.1287/isre.9.2.204. *Inf. Syst. Res* 1998. 9 (2) p. .

[Ramayah et al. ()] 'A decomposed theory of reasoned action to explain intention to use Internet stock trading among Malaysian investors'. T Ramayah , K Rouibah , M Gopi , G J Rangel . *Comput. Human Behav* 2009. 25 (6) p. .

[Cheung and Lee ()] 'A theoretical model of intentional social action in online social networks'. C M K Cheung , M K O Lee . 10.1016/j.dss.2009.12.006. *Decis. Support Syst* 2010. 49 (1) p. .

[Arkorful et al. ()] 'An Empirical Investigation of Health Practitioners Technology Adoption: The Mediating Role of Electronic Health'. E Arkorful , Z Shuliang , S Muhideen , I Basiru , A Hammond . 10.1080/01900692.2019.1664569. *Int. J. Public Adm* 2019. 9 (19) p. .

[Kallanmarthodi and Vaithyanathan ()] 'Assessment of a Modified Technology Acceptance Model among E-banking Customers in Coimbatore City'. G Kallanmarthodi , M Vaithyanathan . *Int. J. Innov. Manag. Technol* 2012. 3 (2) p. .

[Fishbein and Ajzen (ed.) ()] *Belief, attitude, attitude, intention and behavior: An introduction to theory of research*, I Fishbein , M Ajzen . Reading, MA Addison-Wesley Addison-Wesley (ed.) 1975. p. 578.

[Fishbein and Ajzen ()] *Belief, attitude, intention and behavior: An introduction to theory and research*, M Fishbein , I Ajzen . 1975. Reading: Addison-Wesley.

[Singh ()] 'Brokers' Adoption of Net Stock Trading : A Study'. A Singh . *Am. Int. J. Res. Humanit. Arts Soc. Sci* 2013. p. .

[Saare et al. ()] 'Conceptualizing mobile health application use intention and adoption among Iraqi older adults: From the perspective of expanded technology acceptance model'. M A Saare , A Hussain , W S Yue . doi: 10.3991/ijim.v13i10.11285. *Int. J. Interact. Mob. Technol* 2019. 13 (10) p. .

[Silvello and Procaccini ()] *Connected Insurance Reshaping the Health Insurance Industry, no. tourism*, A Silvello , A Procaccini . 2016.

[Kleijnen et al.] 'Consumer acceptance of wireless finance'. M Kleijnen , M Wetzels , K De Ruyter . *J*

[Department of Statistics Press Release Ict Use and Access By Individuals and Households Survey Report ()] *Department of Statistics Press Release Ict Use and Access By Individuals and Households Survey Report*, 2018. Department of Statistics Malaysia

[Amin et al. ()] 'Determinants of online waqf acceptance: An empirical investigation'. H Amin , A.-R R Abdul-Rahman , T Ramayah , R Supinah , M Mohd-Aris . 10.1002/j.1681-4835.2014.tb00429.x. *Electron. J. Inf. Syst. Dev. Ctries* 2014. 60 (1) p. .

[Digital adoption in the insurance sector -from ambition to reality? The Economist ()] 'Digital adoption in the insurance sector -from ambition to reality?'. *The Economist* 2015. (The Economist)

[Jackson et al. ()] 'Effects of individual innovativeness on physician Acceptance of information technology'. J D Jackson , M Y Yi , J S Park . 10.1504/IJSS.2010.034458. *Int. J. Serv. Stand* 2010. 6 (1) p. .

[Chitungo and Munongo ()] 'Extending the Technology Acceptance Model to Mobile Banking Adoption in Rural Zimbabwe'. S Chitungo , S Munongo . *J. Bus. Adm. Educ* 2013. 3 (1) p. .

[Dutot et al. ()] 'Factors affecting the adoption of connected objects in e-health: A mixed methods approach'. V Dutot , F Bergeron , K Rozhkova , N Moreau . 10.3917/sim.184.0031. *Syst. d'Information Manag*, 2018. 23 p. .

[Singh and Muthuswamy ()] 'Factors affecting the adoption of electronic health records by nurses'. B Singh , P Muthuswamy . 10.5829/idosi.wasj.2013.28.11.1899. *World Appl. Sci. J* 2013. 28 (11) p. .

[Sampa et al. ()] 'Influence of Factors on the Adoption and Use of ICT-Based eHealth Technology by Urban Corporate People'. M B Sampa , N Hossain , R Hoque , R Islam . 10.4236/jssm.2020.131001. *J. Serv. Manag* 2020. 13 p. .

[Khan et al. ()] 'Investigating Factors Impelling the Adoption of e-Health: A Perspective of African Expats in China'. I Khan , G Xitong , Z Ahmad , F Shahzad . doi: 10.1177/ 2158244019865803. *SAGE Open* 2019. 9 (3) .

[Hoque et al. ()] 'Investigating factors influencing the adoption of e-Health in developing countries: A patient's perspective'. M R Hoque , Y Bao , G Sorwar . 10.3109/17538157.2015.1075541. *Informatics Heal. Soc. Care* 2017. 42 (1) p. .

[Markopoulos and Markopoulos (2019)] *Mapping monetization across various gaming domains*, E Markopoulos , P Markopoulos . August 2019. 2019. Springer International Publishing. 795.

- [Rouibah et al. ()] *Modeling User Acceptance of Internet Banking in Malaysia : a Partial Least Square (Pls) Approach,*” in *E-adoption and socio-economic impacts: Emerging infrastructural effects*, K Rouibah , T Ramayah , O S May . 2011. IGI Global Publisher. p. .
- [Shaik Allaudin ()] *National eHealth: Moving Towards Efficient Healthcare*, F Shaik Allaudin . 2019.
- [Albar and Hoque ()] ‘Patient Acceptance of e-Health Services in Saudi Arabia: An Integrative Perspective’. A M Albar , M R Hoque . 10.1089/tmj.2018.0107. *Telemed. e-Health* 2019. 25 (9) p. .
- [Davis ()] ‘Perceived Ease of Use, and User Acceptance of Information Technology’. F D Davis . *MIS Q* 1989. 13 (3) p. .
- [Lu et al. ()] ‘Personal innovativeness, social influences and adoption of wireless Internet services via mobile technology’. J Lu , J E Yao , C S Yu . 10.1016/j.jsis.2005.07.003. *J. Strateg. Inf. Syst* 2005. 14 (3) p. .
- [Press Release Demographic Statistics Third Quarter ()] *Press Release Demographic Statistics Third Quarter*, 2019. 2019. Malaysia. Department of Statistics Malaysia
- [Wijesundara and Xixiang ()] ‘Social Networking Sites Acceptance: The Role of Personal Innovativeness in Information Technology’. T R Wijesundara , S Xixiang . 10.5539/ijbm.v13n8p75. *Int. J. Bus. Manag* 2018. 13 (8) p. 75.
- [Thakur et al. ()] ‘Technological opinion leadership: The role of personal innovativeness, gadget love, and technological innovativeness’. R Thakur , A Angriawan , J H Summey . 10.1016/j.jbusres.2015.11.012. *J. Bus. Res* 2016. 69 (8) p. .
- [Shabrina and Zaki ()] ‘The Influence of Perceived Usefulness, Ease of Use, Attitude, Self-efficacy, and Subjective Norms Toward Intention to Use Online Shopping’. R Shabrina , B Zaki . *Int. Bus. Account. Res. J* 2019. 3 (1) p. .