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Factors Determining The Elderly to Use Technology

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Abstract
The use of technology among the elderly depends much on their acceptance and willingness to explore and apply a technology. Previous studies have been conducted to understand the factors that influence the acceptance of electronic technology among the elderly. Therefore, there is a need to have further study on this. In the Malaysian context, studies among the elderly on the acceptance of technology are not ignored. The Malaysian government puts in tremendous efforts to disseminate information and develop facilities for the public through information technology (ICT). The proposed methodology would be quantitative and qualitative. Therefore, the factors that influence the acceptance of technologies among Malaysian senior citizens are interesting to be explored and thus, this becomes the objective of this research.
Keywords: Innovation, Technology, Elderly, Malaysia, Technology Acceptance Model.

Introduction
The term "elderly" refers to people who have attained the age of 60 or more, as defined by the World Assembly on Aging 1982 in Vienna. Malaysia's population aged 60 and above has been expected to reach three point six million in 2021, accounting for 11.2 per cent of the total population. Meanwhile, seven point four per cent of the population, or two point four million people is 65 and above (DOSM, 2021). The elderly population increases every year which is by 2044, 14 per cent of the population is expected to be above 65. This will make Malaysia as an "aged society". This circumtance indicates that the transition in Malaysia happens at a similar trend with Japan and follows the trend of other high income economies (World Bank, 2020). Thus, managing the elderly is a significant challenge to the country.

The increase in age usually comes together with a decline in health and ability to perform daily tasks. However, most of the elderly favors to live independently at their homes and remain in their communities if they can (AARP, 2010). Thus, this choice must come together with the ability of elderly to manage themselves. This condition might be more difficult during the Covid-19pandemic. The Covid-19 pandemic has brought about changes to people's routines, and they must embrace new norms. People are avoiding themselves to commute from one place to another or having face-to-face meetings in order to avoid from being exposed to the risk of being infected by the COVID-19 virus. Consequently, activities like

working, shopping and communication are done via online. Besides, the usual walk-in treatments in hospitals are now made by appointments only. Since they are the high-risk group because they are vulnerable to the virus, such changes become a challenge for the elderly. These changes have disrupted their routines, access to care and contact with friends and family members and this scenario eventually leads to more serious problems.

The findings of a study shows that COVID-19 has affected the mental and physical health among the elderly. They feel the stress and pain from not being able to get proper medical treatment, having limited access to medical and health care, and being isolated from family members and friends which have eventually accentuate the feelings of loneliness (Heidinger & Richter, 2020). Besides, they also need assistance in managing themselves and the internet might be the answer that is seek for in addressing this issue. Therefore, familiarisation of internet and technology like telehealth/telemedicine services among the elderly is required in order to manage health delivery system especially in Malaysia (Nazri et al., 2020).

There are many accessible technologies and services that could assist the elderly to communicate, work, be educated on an issue and to spend their leisure time. Among the tools that do these are mobile phone, computer, smart watch and television. Smart phone is no longer a luxury item, but it is now a common item that is significant. This device allows us to download social media such as WhatsApp, Instagram and Tiktok. However, there are some of the elderlies who prefer to have a bigger screen than that of the smart phone. Hence, they use a tablet or computer. Tools like smart phones, tablets and computers can benefit them in which they can learn new things from applications such as Zoom or YouTube. In addition, tools or gadgets can also be used to monitor their health with the use of applications such as fitness tracker or oxygen monitor. By using these gadgets, the elderly could monitor their heart rate, count their daily steps, monitor their calories burn and identify sleeping pattern. Gadgets could also be the connectors that the elderly can use to do video calls, make regular calls or send text messages via applications such as Whatsapp, Telegram and Snap Chat. Thus, with the use of gadgets, they could avoid loneliness and keep them connected with friends and family. Besides, gadgets could also work as security tools which the elderly could use to make calls or send text messages especially in the case of an emergency. According to Azimi et al (2016), there is an increasing demand for developing novel technologies to provide efficient remote elderly monitoring services too.

The use of technology among the elderly depends much on their acceptance and willingness to explore and apply a technology. Previous studies have been conducted to understand the factors that influence the acceptance of electronic technology among the elderly. Therefore, Peek et al (2014) suggested on the need to have further study on this. In the Malaysian context, studies among the elderly on the acceptance of technology are not ignored. The Malaysian government puts in tremendous efforts to disseminate information and develop facilities for the public through information technology (ICT). Therefore, the factors that influence the acceptance of technologies among Malaysian senior citizens are interesting to be explored and thus, this becomes the objective of this research.

Literature Review
The Need of Technologies among the Elderly
It is reported that the world population of the elderly has increased from 10 per cent in 2000 to 15 per cent by 2025 and is expected to be at 21 per cent by 2050. This rapid growth of

population is eminent in developing countries. In Malaysia, it is expected that the proportion of elderly will grow from six point three per cent in 2000 to 15.0 per cent by the year 2030 (Ramely et al., 2018).

In some Asian countries including Malaysia, the elderly staying with their children is a common tradition. However, changes due to by modernisation and development are taking place and these changes have influenced the traditional family structure. Family issues such as increasing number of divorce cases, putting parents in elderly care by force and abandoning responsibilities are getting more rampant. For example, in Malaysia marriage decreased at one point two per cent and divorce increased at 12 per cent in 2020 compared to the previous year (DOSM, 2020). This statistic is a cause for concern because it may affect the roles of traditional culture and family institution in taking care of the elderly. This alarming scenario requires a change in policy making and people's way of life.

In addition, a study by Aizan et al (2021) suggested that attention should be given efforts on social networks arrangement in order to improve the mental health of the elderly. This is coherent with a previous study conducted among the elderly in Korea, in which its findings Park et al (2014) stated that older adults who had stronger social support were more likely to have higher life satisfaction and better mental wellbeing. Thus, with the increasing number of the elderly, there is a need for studies to be conducted on emerging technologies that may help ease the life of this group of people.

According to the 2000 census, seven per cent of the elderly was as a single member household in Malaysia (Yahaya et al., 2010). The number is expected to increase, with the proportion of elderly women (six point six per cent) is higher than elderly men (five point eight per cent) (Rabieyah & Hajar, 2003; Ramely et al., 2018). Thus, since the number of the elderly living by themselves is on the rise, there is a need for the country to provide more services that support the elderly's well-being. In Malaysia, the level of education among the elderly male is higher than the elderly female (Ramely et al., 2018). However, the present trend of Malaysian residents obtaining higher education (university level) may reverse this situation in the future. In the context of the elderly living by themselves and managing their routines on their own, acceptance of technology among them is crucial. Technology could provide them with more information, help them to cope with the challenges of living in a modern and sophisticated world and enhance their communication with their loved ones. These would assist them in reducing social isolation and improving the quality of their life (Roupa et al., 2010).

The Acceptance of Technology among Elderly
Technology helps the elderly in improving their quality of life and their well-being. The birth of Internet has affected the elderly's life. This is because, Internet allows them to do routines like shopping, paying bills, watching films or dramas, listening to music, communicating with loved ones faster and in an independent way. According to Internet Users Survey 2020 Report by MCMC, the older generation are embracing modern technology more than before. The survey determined that the percentage of Internet users in 2020 stood at 88.7 per cent, a one point three per cent increase from 87.4 per cent in 2018. Internet usage among the elderly age 65 and above has declined from 12.6 per cent in 2018 to 11.3 per cent in 2020. Expectedly, more than half of the non-Internet users are 60 years old and above (51.8 per cent) (MCMC, 2020). Though the numbers of elderly using the computer and internet is increasing, there is still a gap or digital divide between the elderly and the youngsters. Studies have shown that although information and communication technology improve the elderly's quality of life, the acceptance of technology among them is rather low compared to the youngsters. In

addressing this low acceptance, there is a need for social engineers and psychologists to understand the factors behind it.

In a study conducted by Lancaster University in 2018, the fear of using internet results from the difficulty and tediousness of applications used and the long hours spent in surfing for information. Another fear is that users are afraid of being scammed when doing online transactions especially online banking (Lancaster Uni, 2018). Users especially the elderly are also concerned with local business, in which they are afraid that online transactions might cause these local shop owners to reduce the number of workers and as a result, some might lose their source of income. The elderly also feels more comfortable interacting face-to-face than online. Doing online shopping limits their interaction with others and consequently, they feel isolated. This will lead them to other mental health issue like feeling lonely and depressed.

Tsertsidis et al. (2019) have identified several themes on the acceptance of digital technology among the elderly based on the literature review conducted on articles published from the year 2010 to 2018. The themes are listed below:
   i)   Concerns/Problem regarding technology – e.g. technical errors, etc.;
   ii)   Positive Experience with technology - e.g., ease of use factors and privacy implication
   iii)   Benefits of technology - e.g. increased safety, companionship, increased security;
   iv)   Willingness to use technology - e.g., perceived need to use;
   v)   Social influence - e.g., influence by peers, family or surroundings; and
   vi)   Characteristics of older adults - e.g., past experiences/attitudes, physical environment.

Methodology
This section outlines the search strategy and search criteria adopted for this study. Articles with no specification on the study design or the methodology dated from 2016 to 2021 were searched from three research databases. These databases were Emerald, JStor dan Wiley Web Online. The searched articles could either be employing qualitative, quantitative or mixed-method approach. Boolean "AND" and "OR" have been used to construct formulation of the search strategy at the executing stage. The purpose of the search string was to trace the research works that were related the acceptance of technology among the elderly. The keywords used were "innovation" AND/OR "elderly" AND/OR "technology" AND/OR "Malaysia" and a total of 1,110 research works were identified using these keywords. Any duplication of the title of articles and DOI was removed and after the filtering process on title and abstract was done, the relevant literatures were selected through practical screening and the sum of articles left was 76. The searching was then expanded through a manual search from Google scholar database and "snowball" concept was applied as this is to ensure that all the works of literatures that were not indexed in any libraries would be handled as well. From the Google Scholar database, five additional works of literatures were found, and the final list of literatures was 81. Screening for technology, innovation and elderly using quality criteria was conducted to assess the credibility, relevance, value and comprehensiveness of the selected papers (Okoli & Schabram, 2010).

All retrieved papers in digital libraries must be written in English. Any article that did not follow the inclusion criteria was excluded. Finally, articles that followed the criteria were ready for the synthesis review. Hence, it was found that fundamentally, there were six main factors that influenced the acceptance of technology or innovation among the elderly. The factors were (i) concerns regarding technology; (ii) experienced characteristics of technology; (iii) experience benefits of technology; (iv) willingness to use technology; (iv) social influence; and (v) characteristics of elderly.

Therefore, this study will implement a mixed qualitative and quantitative approaches in the future. For the quantitative data, the OPQOL and TAM questionnaire will be employed, while a semi structured interview will be used to gather the qualitative data. The questionnaire will be used to perform a cross-sectional study of 200 Malaysians over 60 years old. The questions are divided into two sections: (i) demographic information; and (ii) factors that influence how the elderly use technology. The questionnaires are written in Bahasa Melayu. Due to the obvious respondents' diverse background, the questionnaires will be administered via face-to-face interview rather than self-administered. The interviewer will present and repeat responses to the interviewees to ensure that their responses are correctly recorded.

Discussion

One of the objectives of this research is to propose a conceptual framework. Consequently, the Theory of Reasoned Action (TRA) and the Technology-Organization-Environment (TOE) frameworks are mentioned. Fishbein and Ajzen (1975) proposed TRA, which asserts that an individual's behavioural intentions are determined by his or her attitude toward the behaviour and subjective norms. The Theory of Planned Behavior (TPB) and the Technology Acceptance Model are both extensions of the TRA (TAM). According to Ajzen (1991), behavioural intentions are influenced by an individual's attitude toward the behaviour, subjective norms, and perceptions of behavioural control. TAM is an information systems (IS) field adaptation of TRA. The model postulates that perceived usefulness, perceived ease of use, and subjective norms all influence technology acceptance (Davis, 1989). Individual technology acceptance is postulated to be influenced by relative advantage, ease of use, and image in Rogers (1962) and Moore and Benbasat (1991) Innovation Diffusion Theory (IDT). The Technology Readiness Index (TRI), proposed by Parasuraman (2000), asserts that an individual's technology acceptance is determined by "an interaction between technology readiness's drivers (optimism, innovativeness) and inhibitors (discomfort, insecurity)" (p.317). However, this model considers only personal factors rather than social ones, whereas the TOE framework addresses technology acceptance in organisational settings.

The TOE framework considers technological, organisational, and environmental factors, giving it a broader coverage than other models. However, TOE was originally designed for organisational contexts that explicitly consider organisational factors. The organisational factors incorporated into TOE are incompatible with individual acceptance of technology. Rather, personal factors should be considered when determining individual acceptance of technology. Hence, this article proposes a derivation of the TOE framework in examining the effects of technological, personal, and environmental contexts on technology acceptance among individuals. This framework is referred to as the Technology-Personal-Environmental (TPE) model.

Proposed Conceptual Framework
Based on the literatures, the conceptual framework for this study is depicted below.
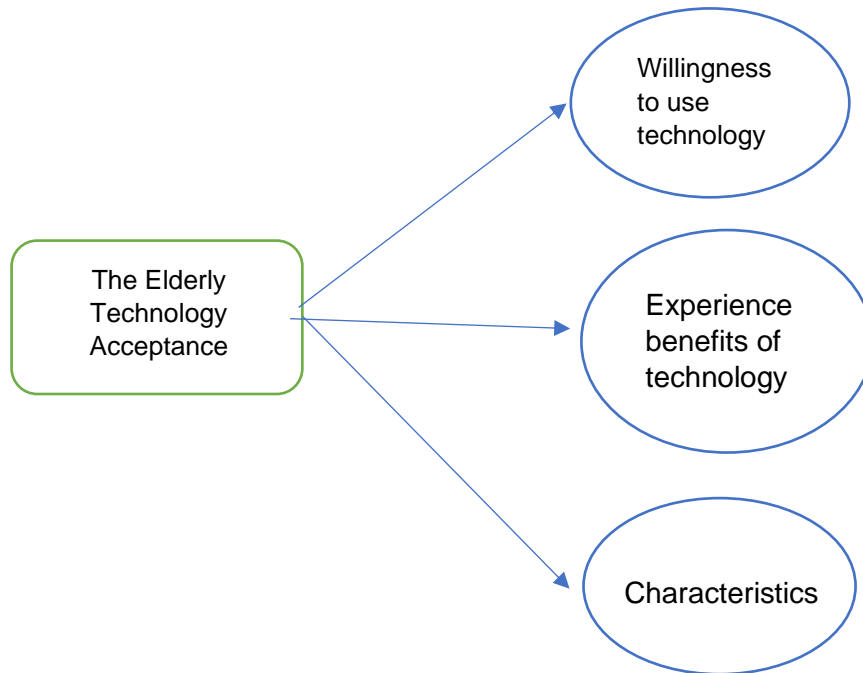
This model consists of three main factors. These factors are social influence on willingness to use technology, individual or elderly characteristics and experience with technology benefits. Each of the factors is explained in detail in the following paragraphs.

Technology
All variables related to technology are categorized into this dimension. The possible variables as suggested by literatures are technical errors, ease of use factors, privacy implications, experience benefits of increased safety, companionship, increased security and the willingness to use technology for example, perceived need to use the technology. Nowadays, technology is one of the main elements that is utilised as a medium to collect, store and distribute information. Hence, due to the potential benefits, many organisations have implemented technology to ease the process of distributing information and communication (Daud et al., 2020).

Social
The social dimension may include variables related to the social influence, for example, influence by peers, family or surroundings. Giger et al. (2015) have pointed out that participants require more time to use the technology and that the interaction is highly affected by social influences. The last characteristic of the technology that has been appreciated by seniors was unobtrusiveness; they reported that they felt the technology was not intruding their lives.

Characteristics
This dimension may include the elderly's past experiences/attitudes, and physical environment. The openness to accept technology is essential for the elderly in order to cope with the changing lifestyle for example, using Mysejahtera application in monitoring health risk against COVID-19 and accessing necessary information from the Ministry of Health.

Conclusion

All in all, this article contributes to a greater understanding of the factors that influence the elderly's willingness to use technology, particularly during the Covid-19 pandemic. Despite their gradual adoption of technology, studies have shown that they also see the advantages. The outcome may differ depending on the situation. However, earlier studies have provided a foundation for a study to be conducted in Malaysia. Therefore, in the future, this study will adopt a mixed of qualitative and quantitative approaches to confirm the discovered factors that influence the elderly to use technology in Malaysia.

References

AARP. Research and Strategic Analysis. (2010). Home and community Preferences of the 45+ population. Retrieved from https://assets.aarp.org/rgcenter/general/ home-community-services-10.pdf

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, *50*(2), 179-211.

Azimi, I., Rahmani, A. M., Liljeberg, P., & Tenhunen, H. (2017). Internet of things for remote elderly monitoring: a study from user-centered perspective. *Journal of Ambient Intelligence and Humanized Computing*, *8*(2), 273-289.

Daud, R., Ab Rahim, N. Z., Ibrahim, R., & Ya'acob, S. (2017). The Knowledge Communication Conceptual Model in Malaysian Public Sector. In *International Conference on Knowledge Management in Organizations* (pp. 27-38). Springer, Cham.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.

Department of Statistics Malaysia (DOSM). (2021). Population Size and Annual Population Growth Rate. Retrieved from https://www.dosm.gov.my/v1/index.php?r=column/pdfPrev&id=ZjJOSnpJR21sQWVUcUp6ODRudm5JZz09

Department of Statistics Malaysia (DOSM). Marriage and Divorce Statistics, Malaysia. (2020). Retrieved from https://www.dosm.gov.my/v1/index.php?r=column/cthemeByCat&cat=453&bul_id=QmZ1cE4xRFAvYWQ0R05hTk1rWm5KQT09&menu_id=L0pheU43NWJwRWVSZklWdzQ4TlhUUT09

Giger, J. T., Pope, N. D., Vogt, H. B., Gutierrez, C., Newland, L. A., Lemke, J., & Lawler, M. J. (2015). Remote patient monitoring acceptance trends among older adults residing in a frontier state. *Computers in Human Behavior*, *44*, 174-182.

Heidinger, T., & Theresa, Richternazri, L. (2020). The Effect of COVID-19 on Loneliness in the Elderly. An Empirical Comparison of Pre-and Peri-Pandemic Loneliness in Community-Dwelling Elderly. *Frontiers in Psychology*. 10.3389/fpsyg.2020.585308

Hamid, T. A., Din, H. M., Bagat, M. F., & Ibrahim, R. (2021). Do Living Arrangements and Social Network Influence the Mental Health Status of Older Adults in Malaysia?. *Frontiers in Public Health*, *9*.

Lancaster University. (2018). Why some older people are rejecting digital technologies? ScienceDaily. Retrieved November 14, 2021 from www.sciencedaily.com/releases/2018/03/180312091715.htm

Malaysian Communication and Multimedia Commission. (2020). Internet Users Survey 2020 (IUS 2020) by Malaysian Communication and Multimedia Commission. Retrieved from https://www.mcmc.gov.my/skmmgovmy/media/ General/pdf/IUS-2020-Report.pdf

Moore, G. C., & Benbasat, I. (1996). Integrating diffusion of innovations and theory of reasoned action models to predict utilization of information technology by end-users. In *Diffusion and adoption of information technology*, 132-146. Springer, Boston, MA.

Okoli, C., & Schabram, K. (2010). A guide to conducting a systematic literature review of information systems research.

Park, S., Smith, J., Dunkle, R. E. (2014) Social Network Types and wellbeing among South Korean Older adults. *Aging Men Health*. 18:72-80

Parasuraman, A. (2000). Technology Readiness Index (TRI) a multiple-item scale to measure readiness to embrace new technologies. *Journal of service research*, *2*(4), 307-320.

Rabieyah, M., & Hajar, M. T. (2003). Socio-Economic Characteristics of The Elderly in Malaysia. Paper presented at the 21st Population Census Conference Analysis of the 2000 Round of Censuses, Kyoto, Japan

Ramely, A., Ahmad, Y., & Harith, M. N. H. (2018). Understanding socio-demographic patterns and wellbeing dimensions of the elderly in Malaysia: the way forward in reaching an age nation by 2030. *Journal of Administrative Science*, *15*(1), 1-19.

Tsertsidis, A., Kolkowska, E., & Hedström, K. (2019). Factors influencing seniors' acceptance of technology for ageing in place in the post-implementation stage: A literature review. *International journal of medical informatics, 129,* 324-333.

World Bank. (2020). A Silver Lining: Productive and Inclusive Aging for Malaysia. Retrieved from https://www.worldbank.org/en/country/malaysia/publication/a-silver-lining-productive-and-inclusive-aging-for-malaysia

Yahaya, N., Abdullah, S. S., Momtaz, Y. A., & Hamid, T. A. (2010). Quality of life of older Malaysians living alone. *Educational Gerontology, 36*(10-11), 893-906.