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Centre for
Ageing and
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老齡化和醫療管理研究中心

Title	The adoption of smartphone and social media among elderly
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Issue Date	2020
Issue Number	2
Paper Number	1
Citation	Lau, C., Yee, H., Ng, T. & Fong, B. (2020). *The adoption of smartphone and social media among elderly* (CAHMR Working Paper Series No. 1, Issue 2, 2020). Hong Kong: The Hong Kong Polytechnic University, College of Professional and Continuing Education, School of Professional Education and Executive Development, Centre for Ageing and Healthcare Management Research. Retrieved Aug 8, 2020 from http://weblib.cpce-polyu.edu.hk/apps/wps/assets/pdf/cw20200201.pdf
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The Adoption of Smartphone and Social Media among Elderly

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ABSTRACT

Information technology keeps advancing and the use of smartphone and social media has not been widely adopted in the elderly population. The Government has initiated different programmes to promote and enhance the quality of life among older adults. Benefits of using smartphone and social media mainly include maintaining communication with families and friends, finding entertainment, receiving informal education, and enhancing healthcare and safety. However, the elderly gave mixed comments on the use of information technology. Some elderly perceived new technology adoptions as being complicated and difficult to use and non-user-

friendly design. Cost-effectiveness and privacy are also barriers to them. To change attitudes of the elderly, the government may cooperate with non-government organisations to organise more promotional activities. Family members and the manufacturers can also assist the elderly by improving cybersecurity and creating a simple and easy-to-use design.

KEYWORDS: attitudes to technology adoption, social media, smartphone, perceived ease of use, perceived usefulness, elderly, social connectivity

1 INTRODUCTION

Information technology keeps on developing and affects our daily life. Different from traditional cell phones which are mainly used for making calls and sending messages, smartphones have advanced features, including internet access via Wi-Fi connection and mobile network, video and music player, Global Positioning System (GPS) navigation and mobile applications for information, social connectivity and entertainment (Census and Statistics Department, 2019). Social media refer to the forms of social networking, including photographs and videos sharing, discussion forums and blogs (Hafez, Wang & Arfaa, 2017). Multiple media can be accessed through mobile applications and therefore, smartphones become a popular and necessary item as they allow easy access to information and social interactions. The use of smartphones in turn improve people's well-being, quality of life and psychological functioning (Mellor, Firth & Pereira, 2008).

The usage of mobile device and social media has been increased among the elderly aged 65 years or above. Although about 3 in 5 of them had smartphone in 2018, compared to only 2 in 5 in 2016, elderly is still the smallest user group and many of them do not engage in social media usage (Census and Statistics Department, 2019; Hafez, Wang & Arfaa, 2017). Only 57.2% of elderly aged 65 or above had smartphone, compared to over 90% in the other age groups. This is mainly due to resistance or rejection of adopting new technology, and complex perception on managing electronic devices (Abdulrazak, Malik, Arab & Reid, 2013).

In Hong Kong, in order to promote the use of information and communication technology (ICT) among the elderly, ICT Outreach Programme and Enriched ICT Training Programme have been launched by the Office of the Government Chief Information Officer (OGCIO) since 2012 and many positive feedbacks have been received (Office of the Government Chief Information Officer, 2018). Both programmes have been extended into a two-year programme to give more opportunities to the elderly with dementia to enhance their ability in using information technology and to provide advanced training to elderly people. ICT Outreach Programme increases the quality of life by information technology, and encourages the older adults to use electronic devices to increase their interest and knowledge. OGCIO subsidises non-government organizations to teach elderly in using mobile devices and mobile tablets. It also provides treatments and exercises and communication opportunities with others. Enriched ICT Training Programme aims to further enhance elderlies' basic knowledge and abilities in using information technology and encourage them to teach their acquired skills to others. This programme cooperates with the Elderly Academy to provide different aspects of information technology courses and the elderly can apply according to their own interests. Elders should be able to better connect with the community and increase their self-confidence after having completed the programme.

2 ADVANTAGES OF USING SMARTPHONE AND SOCIAL MEDIA AMONG ELDERLY

2.1 Maintaining social connectivity

Many older adults experience decline of interaction, hence increase in isolation from their friends and family members, resulting in social and emotional loneliness (Haris, Majid, Abdullah, & Osman, 2014; Delello & McWhorter, 2017). The use of mobile technologies and social media facilitates closer relationship between elderly and the community through the exchange of

information in the virtual world. Such activities elicit closer family ties and further enhance the connectivity of their pre-existing social connections (Delello & McWhorter, 2017).

The elderly can maintain social ties through text, voice calls and images in different social platforms via smartphones. Facebook and Instagram are popular social networking sites, providing convenient features such as the "Like" button, sharing photos and videos, commenting on others' photos, and viewing videos, to facilitate social bonding and bridging (Jung & Sundar, 2016). They can search information and photographs of family events and the daily life of the family members. They can also make video calls through communication apps like WhatsApp and Skype so they can have live chats anytime and anywhere. This provides the opportunity for online intergenerational interactions as elders can communicate with their children and grandchildren via multimedia features. In a sense, the use of social media connects the elderly with their family members with stronger bonding, links them with others in their age group, and bridges generation gaps.

In the community, the elderly can communicate with people who have similar interests and this enhances social contact. Older adults may participate in activities which can promote better health by using social media (Madden, 2010). They can also join some online social groups and browse news related to the community they live in. Through the use of social media, they can have enjoyment. These actions can prevent isolation and feeling alone among the elderly because there are social supports and the latest information (Leist, 2013; Chopik, 2016).

2.2 Finding entertainment

Apart from connecting with friends and family members, the elderly can use smartphone and social media to entertain themselves. There are many media that offer mobile apps with easy access. For example, YouTube is used for watching videos or listening to music. Google Chrome helps to search for different information like online news. For book lovers, there are free to download applications like Amazon Kindle for e-books online. There are also apps for online movies and television programmes. In addition, mobile games are available from the Internet.

2.3 Receiving informal education

Informal education means 'any voluntary, self-paced learning occurring in various everyday situations' and mobile devices are easily accessible tools that assist elderly in such learning (Jin, Kim & Baumgartner, 2019). Instead of having a formal learning curriculum, self-paced learning through using mobile devices allows the elderly to choose their learning medium and assess different learning material anytime and anywhere, depending on their own preferences (Leen & Lang, 2013; Ng, 2013).

Easy access to the Internet via mobile phone applications can satisfy the elderly's desire for knowledge seeking in terms of their interests such as cooking, language and health related topics like nutrition and physical exercise (Lee, Han & Jo, 2017). Elderly learners can then actively engage in social media and online discussion forums to expand their knowledge by using mobile devices. Moreover, collaborative learning experiences are promoted for learners as they can exchange their acquired knowledge through sharing and commenting other users' postings (Jin,

Kim & Baumgartner, 2019). Therefore, mobile devices provide a very convenient platform for sustainable informal and lifelong learning for elderly (Ng, 2013).

2.4   Improving healthcare and safety

Mobile health devices have functions including recording health status such as heart rate and temperature, monitoring treatment process, and reminding medical appointments (Deng, Mo, Liu, 2014). Many mobile health applications are equipped with automatic link to Internet resources and enable patients to upload health data such as diabetes self-test results to a cloud platform, allowing doctors to make diagnosis and access the data in real time (Weinstein et al., 2014). The most popular online healthcare service in recent years is telemedicine, which is the use of video conferencing and telecommunication to enable medical services such as consultations, diagnostics, and education at a distance (Weinstein, et al., 2014; Bujnowska-Fedak, & Grata-Borkowska, 2015). The adoption of such mobile health technology benefits the elderly in maintaining their health conditions, overcoming mobility issues and promoting independent living.

Some mobile applications are equipped with the functions of navigation and GPS to deal with emergency and safety, to allow family members and caregivers to track the elderly's location and ensure safety, and to provide immediate referral support. A similar technology "e-Care Link TM" has been developed to connect mobile devices with a 24-hour Call and Care Service Centre for emergency services and support to the elderly. The centre also monitors the elderly's location and contacts responsible organisations like the police and ambulance service when necessary. Family members and relatives can also use the mobile application called "e-See Find Service" to check the location of the elderly (Senior Citizen Home Safety Association, 2019).

2.5   Enhancing mental and cognitive health

Social ties and connections are facilitated by the adoption of technology and social media among elderly, resulting in the reduction of loneliness, isolation and depression symptoms, leading to improvement of psychological well-being (Cotten, Anderson & McCullough, 2013; Heo et al., 2015; Chopik, 2016). Loneliness and social isolation are predictors of cognitive decline among older adults aged 65 and above, and social interaction could help to overcome age-related memory changes (Quinn, 2018). Thus, the frequency of interactions in social media platforms like Facebook protects individuals from developing dementia and cognitive impairment (Seeman et al., 2001).

Engaging in greater social technology will enhance cognitive functioning due to the shift between tasks and concepts during the use of technology (Quinn, 2018). It is noted that brain training, including the ability to change and adapt to new information reduces cognitive decline in ageing (Delello & McWhorter, 2017). Moreover, learning to use new technology and social media has demonstrated improvement in executive functions in dimensions of episodic memory and processing speed (Quinn, 2018; Chan et al., 2016). The elderly can also learn and practice some new skills and movement from mobile applications, helping to enhance their logical and critical thinking when they play some problem-solving games. Thus, gaming can decrease the age-related cognitive decline such as memory loss and cognitive abilities, resulting in the reduction of risk of dementia in older age (Charness & Boot, 2016).

3 THEORIES AND MODELS OF TECHNOLOGY ADOPTION

3.1 Technology Acceptance Model

Adapted from Theory of Reasoned Action (TRA) (Figure 1), Technology Acceptance Model (TAM) (Figure 2) has been developed to explain why people accept or resist the use of computer-based information technology (Davis, Bagozzi & Warshaw, 1989). Expending from the general relationship between personal beliefs, attitude and behavioural intention in TRA, perceived usefulness and perceives ease of use are added in TAM as the primary factors of affecting the intention to use information systems. External variables such as menus, icons and touch screen can enhance usability of information system and affect the behaviour of users.

Perceived usefulness is about the subjective understanding of users which can increase job performance within the organisational context after using the specific application system. It can be measured by the dimensions of the usefulness of the job and increase the productivity, job performance, efficiency and quality of job. They refer to whether technology can help in the task. For example, to communicate with families easier and improving their health conditions and knowledge. While perceived ease of use is the degree about the expectations of using the system, which can be free of effort from users. It can be measured by easy to use, easy to learn, easy to become skilful and easy to understand. They also refer to the accessibility and the achievement of the technology (Davis et al., 1989; Holder & Karsh, 2010).

According to the TAM, perceived ease of use, together with the perceived usefulness, can affect people's attitude in using a new technology. For example, an elderly may think that smartphone and social media are too hard to learn and use, or wasting his/her time, and he/she would not want to accept this technology. However, when an elderly reckons the technology easy to learn and helping them to acquire knowledge, he/she would change his/her attitude and would consider using the smartphone and social media (Charness & Boot, 2016).

Before the actual use of technology, behavioural intention to use is about the end-user satisfaction of acceptance. It is affected by the perceived usefulness and attitude toward using. It is used to measure the outcome of interest only because it predicts the actual use only. It is difficult to measure the end-user satisfaction (Holder & Karsh, 2010). Once people have a behavioural intention to use a new technology, they will take action to use the new system. As TAM is applicable in different technology, it is a useful framework in inferring the benefits and barriers on using the social media and smartphones among the elderly.

3.2 Unified Theory of Acceptance and Use of Technology

Similar to the TAM, the Unified Theory of Acceptance and Use of Technology (UTAUT) includes factors of perceived ease of use which is effort expectancy, and perceived usefulness which explains performance expectancy (Venkatesh et al., 2003). The main difference between TAM and UTAUT includes contextual factors such as social influences and perception on the availability of technical support as facilitating conditions for technology adoption. For example, elder adults are more likely to be a Facebook user when their important family members or friends ask them to join, or assistance and support are available immediately when they encounter difficulties (Charness & Boot, 2016). In addition, influences of experience, voluntariness, gender, and age are four significant moderators, that are identified as integral features of UTAUT. For

example, the effect of social influence is stronger for women than men while performance expectancy effect is stronger in men than women. This theory provides a useful tool for increasing the acceptance of using smartphones and social media, and providing insights into interventions among elderlies.

Figure 1. Theory of Reasoned Action (TRA)
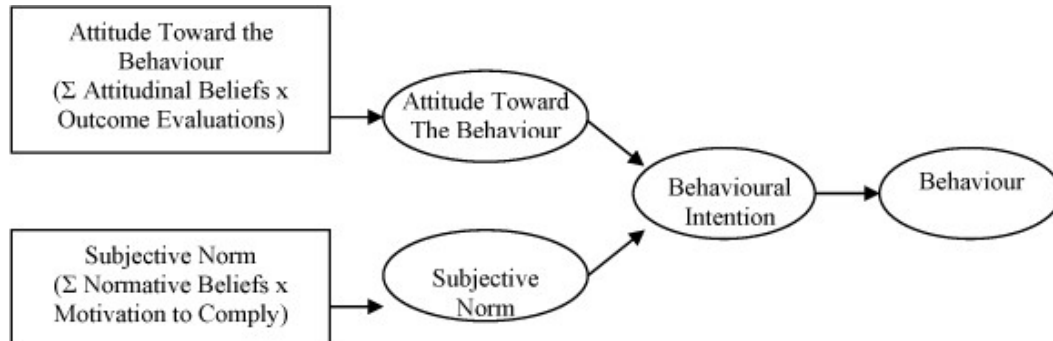
Source from Davis, Bagozzi & Warshaw (1989)

Figure 2. Technology Acceptance Model (TAM)
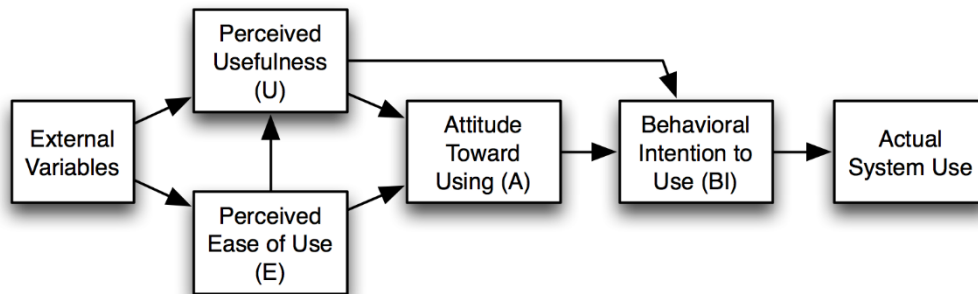
Source from Davis, Bagozzi & Warshaw (1989)

4   BARRIERS IN USING SMARTPHONE AND SOCIAL MEDIA FOR ELDERLY
4.1   No life experience in using computers

Many elderlies have no experience in using computers and the associated software and applications. Some equipment may not be developed for use by the general population when these older adults went to school and university during their young days. Therefore, there is a significant knowledge and experience gap in this group, creating a barrier to the adoption of the new electronic device. The older adults are lack of confidence in learning and manipulating the smartphone.

4.2   Complex functions in design of smartphone

The smartphone is an intelligent device with many functions and applications, but it is too complex for the elderly to handle (Charness & Boot, 2016). Although there are useful functions, including log-in to social media, applications, making telephone calls, setting alarm and taking photographs, the complicated menu is hard to use and makes the elderly frustrated easily (Chen et al., 2013). Furthermore, the size of words and figures are too small to read, and the buttons are too crowded to handle. (Chen et al., 2013). The elderly may unintentionally choose the wrong

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functions by calling someone accidentally or locking the keyboard because they cannot remember the designated functions from the keys. The layout and interface design of the smartphone are not suitable for the elderly with physical limitations in vision or hearing, or arising from arthritis and some rheumatic conditions (Wildenbos et al., 2018). Cognitive ageing makes the learning process slower and thus new technology would be even less appealing to the older adults (Salthouse, 2010; Charness & Boot, 2016). These 'complex' functions affect the perceived ease of use, and hence, motivation in using smartphones.

4.3   Financial burden

Cost of a smartphone and its service fee do not encourage the elderly to adopt the 'new' technology even when they perceive it beneficial. They form another major barrier. It has been shown that income and age are strongly associated with smartphones ownership. The older age group normally has lower income and thus less likely to own smartphones (Charness & Boot, 2016). This is natural because most of the elderly have retired and do not have extra disposable financial resources for expensive items. Many of them may think a simple mobile phone would be good enough as they mainly use the direct calling function rather than texting instant messages. Furthermore, many value-added services in the smartphone such as mobile data for Internet access, call forwarding and polyphonic ringtone charge much more than using a basic mobile phone (Chen et al., 2013).

4.4   Privacy and cyber security

Concerns about privacy and information security are considered as negative facilitating conditions on technology adoption in UTAUT. This is more evident among elderly aged 65 years or above, compared to the more younger age groups (Hoofnagle et al., 2010; Fox et al., 2000). Older adults seldom post their personal information such as photos, date of birth, membership and contact number on the internet. They may not know how to block cookies and delete browsing history (Charness & Boot, 2016).

5   SOLUTIONS

Motivation is essential in driving the elderly to accept new technologies. Managing the electronic functions and accessing supports are often cumbersome and frustrating, resulting in unwillingness to continue to use smartphones and social media among the elderly (Wildenbos et al., 2018). To promote positive perceptions and attitudes towards the use of technology, practical benefits of self-independence and healthy active ageing, as well as usability and reliability, should be promoted (Hawley-Hague et al., 2014). Modification of technologies can result in the ease of use and better experience to the older adults, especially those who are disabled, home-bound or even bed-bound. Such measures modulate the views of the users and uphold their motivation and wish to learn and experience more about the devices in the usefulness in daily living. Therefore, family members, carers, friends and community health practitioners should encourage the elderly and provide assistance to them in order to encourage the adoption of smartphones and social media usage.

The government and non-government organisations (NGOs) can provide financial support and learning opportunities to elderly to acquire and learn how to use smartphones because most

elderly are retired and are less ready to or seldom spend their money on expensive goods. On the other hand, the government can collaborate with NGOs to organise age-oriented ICT training for this group in the community.

The silver market is huge in an increasing world-wide ageing population. Manufacturers of smartphones and creators of social media should capture the opportunity. They ought to be innovative in the design and presentations to attract and facilitate the utilisation of the technologies and devices of elderly (Wildenbos et al., 2018). Designers can provide an easy-to-browse version of the mobile app targeted at the elderly. For example, in the HKTVmall online shopping apps, the creator has set extra-large font and pictures and use the voice search function to help the elderly to search for the items (HKTVmall, 2019). The functions must meet the special needs of the elderly with the easy to carry out different tasks and allow for usefulness, leading to increased motivation and better attitude towards the new technology.

Moreover, family members, carers and friends are in the best position to advise and remind the elderly in proper and safe adoption of smartphone and related technologies such as network security and Internet safety, helping them when they encounter difficulties. Furthermore, family relationship can be enhanced as the elderly become confident and feel safe in learning to use the smartphone and handling the social media.

6   CONCLUSION

Information technology keeps advancing and changing every day. People are using smartphone and social media to collect latest news from the society and exchange information with others, bringing many benefits such as maintaining social ties, providing continuous education opportunity, enhancing mental health and safety concern, etc. to the older adults. However, due to the lack of life experience with mobile technology and cognition degradation in the elderlies, some of them think that technology adoption is complicated and expensive. They may not have the motivation or knowledge to use smartphones. To enhance their perceived ease of use and usefulness, the government, non-government organisations, smartphone manufacturers, mobile app creators and family members should assist elderlies in the adoption of new technology.

7   ACKNOWLEDGEMENT

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