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The Importance of E-Wallet Technology

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Abstract

The development of e-wallet technology is seen as an added value to the society's lifestyle today. However, each user will make a choice and show a different response to a new technology whether to accept or reject it. The world is developing more and more from time to time until the human role is taken over by various new technologies. Malaysia is no less great in implementing the introduction of the e-wallet payment system as a new facility for users. Various ICT sophistication and development are implemented to influence and change the minds of users to switch to e-wallet technology. Therefore, this conceptual paper is very important to develop the awareness to the readers and become a reference for all parties to understand the behavior of the community in Malaysia towards the acceptance of e-wallet technology.

Keywords: Importance, Acceptance, Development, e-Wallet, Technology

Introduction

The use of ICT is seen to be very widespread involving administration, national development, economy, education and so on (Misdi et al., 2009). According to Rogers (1993), ICT is a tool used by an individual to interact with other individuals and use it for the purpose of creating something. While Musa (2002) stated that ICT helps speed up a process and activity more efficiently and reduce errors. This situation has indirectly improved the standard of living of the world population to become better (Holmes, 2005).

The existence of ICT in Malaysia began around 1996 when the government announced the implementation of the technology as an engine of national economic growth (Luaran, 2013). This can be seen when the Multimedia Super Corridor Project or MSC (Multimedia

Super Corridor) was announced in August 1996 as a driver to achieve the 2020 vision (Mohamad, 1998). Therefore, Malaysia has been known as one of the countries that shows determination to explore progress in the digital field (Mohamad, 2002).

The development of technology today is seen as an important phenomenon that has had a major impact on the daily lives of people worldwide. This is because everything that happens in human society is always changing through the development and change of technology (Abd Rahman et al., 2017). This matter is also driven by the sophistication of Information and Communication Technology (ICT) which has made a country and society more advanced in the era of globalization (Jorgenson & Vu, 2016).

However, not many communities fully accepted ICT technology in the early 2000s (Ahmad et al., 2014). In addition, there are situations where some individuals are still hesitant to make choices and show different responses to ICT (Straub, 2009). Therefore, the government continues to be committed to producing Malaysians who are ICT literate and skilled and contribute to the progress of the country (Mohamad, 1998). This can be seen through the Seventh Malaysia Plan (RMK-7) for the period 1996-2000 which emphasizes the development of ICT in the community (Mohamad, 2002).

RMK-7 has outlined various transformation programs to ensure that the people are not left behind in using ICT (Mohamad, 2002). This can be seen when the 'Satu Keluarga Satu Komputer' campaign which was implemented starting on 1 July 2000 made it easier for people to own a computer through the issuance of Account 2 in the Employees' Savings Fund (Mahathir Mohamad, 2002). Thus, it can reduce the digital knowledge gap between urban and rural residents (Mohamad 2002). In addition, the community can also increase productivity through ICT to stimulate their sources of income (Ahmad et al., 2014).

The emergence of digital technology and the internet which is growing rapidly every year has finally contributed to the improvement of the quality of life and communication of society drastically (Damanpour & Schneider, 2009). This can be seen when the percentage of Internet use in Malaysia has increased to 84.2 percent in 2019 compared to 81.2 percent in 2018 (Mohd Uzir Mahidin, 2020). In addition, individuals using the Internet in Malaysia aged 15 and above have also increased to 80.1 percent in 2017 compared to 71.1 percent in 2015 (Alias, 2018).

According to the Head of the Malaysian Statistics Department, Mahidin (2020), there are five most popular activities among Internet users. Among the activities involved are the use of social media (97.1%), downloading pictures and videos (84.7%) and searching for information about goods or services (83.5%). In addition, users also often make calls via Internet / VoIP (77.4%) and download software and applications (77.1%). Thus, the development of ICT in Malaysia is seen to have become a very important medium of communication and has a positive impact on society today (Faradillah Iqmar Omar et al., 2015).

The Role of ICT in the Malaysian Economy

The rapid development of ICT greatly affects the economic growth of a country in facing the era of digital economy today (Damanpour & Schneider, 2009). In Malaysia, current economic changes have created a new economic ecosystem known as Knowledge-Based Economy or K-economy (Abdulai, 2001). According to Basri (2015), K-economy has two basic principles which are knowledge and ICT. Therefore, K-economy is seen as an important source for the country to generate income in this day and age (Basri, 2015).

According to a report on the development of science, technology and industry in 2006, it is estimated that more than 50 percent of the Gross National Product in the main economy is based on the K-economy (OECD, 2006). This includes activities contributed by intensive knowledge-based sectors, namely the education, communication and information sectors (OECD, 2006). Therefore, every country involved in K-economy activities needs to increase efforts in research and development (R&D) for the science and technology sector (Salmi, 2005). This is because the field of K-economy is always growing rapidly and requires high ICT capabilities and skills (Aubert, 2005).

The development of ICT technology in Malaysia is also very important to face and compete in the K-economy system at the global level (Omar et al., 2015). This is because if a country fails to compete in this global economy, then that country will fall behind and be listed in the backward country category (Basri, 2015). Therefore, joint ventures with foreign countries are very necessary to strengthen trade relations, development, environment and so on (Siegler, 2007). In addition, the discussion on the sharing of ICT technology that crosses borders also needs attention (Mohnen, 2005). This is so that Malaysia does not fall far behind in pursuing changes in the current K-economy industry (Mohnen, 2005).

According to Bajunid (2005), Malaysia is seen as always committed to producing highly knowledgeable human capital, especially in the field of ICT. This is to face the challenges of employee competition as well as the digital divide which is an obstacle to economic development and growth (Salmi, 2005). In addition, local industry players are also advised to play a role by providing incentives for the use of employees in an effort to improve ICT knowledge (Kamara et al., 2007). This includes the provision of personal computers and access to the internet at work (Kamara et al., 2007).

Overall, Malaysia has recorded positive developments in the K-economy industry (Raman, 2018). This can be seen when approximately seven percent of Malaysia's GDP is derived from digital products and services produced directly through ICT (Raman, 2018). The use of technology involved is the Internet of Things (IoT) and the use of smart devices (Stewart, 2008). Therefore, Malaysia's digital economy is expected to continue to increase and contribute to approximately 45 percent of GDP by 2022 (Raman, 2018).

Implementation of Technology in Online Business

Today's economic transformation exists due to the change in setting goals and strategies from conventional businesses to digital businesses (Perry & Sherlock, 2008). This is because digital business is seen to be able to improve the performance and profits of a company (Perry & Sherlock, 2008). According to Flecknoe (2008), the incorporation of ICT has seen the emergence of various types of electronic commerce or E-commerce (e-commerce). It also includes other electronic services that are preferred by most corporate organizations (Flecknoe 2008). In addition, E-commerce is also seen as one of the solutions to the problems faced by business firms in the past (Flecknoe, 2008).

However, the use of ICT in E-commerce business is seen to have a serious impact on the use of physical money and checks in the future (Flecknoe, 2008). This is because users think that online transaction payments are easier and safer to do (Venkatesh et al., 2003). In addition, E-commerce also changes the way of life of a user because it is more efficient and improves the level of performance of the individual towards ICT compared to others (Ishak, 2014). Therefore, E-commerce is seen to have drastically changed the business landscape in Malaysia to the extent that it has successfully influenced users' trust in the online platform (Saad & Daud, 2016).

According to Roman and Riquelme (2014), the high level of internet knowledge among users influences this group to use E-commerce services. This is because online purchases provide more comfort to consumers compared to purchases at business premises (Azmi & Peng, 2014). In addition, online purchases can also save buyers time to get the desired goods or services (Zendehdel & Paim, 2013). Therefore, E-commerce platforms are now the choice due to the factors of usefulness, convenience and normative beliefs that influence users (Yulihastri et al., 2011).

Advertising on the internet is also seen as an important medium to attract and retain E-commerce users (Haque et al., 2007). This is because advertisements are a measure of customer attraction and satisfaction towards purchasing goods online (Wolfenbarger & Gilly, 2001). In addition, online advertising should also be constantly increased along with improvements in E-commerce services (Bodreau & Watson, 2006). This is so that online traders can increase awareness of their products while managing demand risk more effectively (Bodreau & Watson, 2006).

ICT's contribution to the national economy is also seen to continue to grow in 2018 by 18.5 percent compared to 18.3 percent in the previous year (Mahidin, 2019). This at the same time gives awareness to the industry and society to change to economic activities that have added value to drive the development of Malaysia (Rashid, 2019). Therefore, E-commerce and ICT services are predicted to be major contributors in the country's efforts to achieve the target of 17 percent of Gross Domestic Product (GDP) in Malaysia's digital economy (Abdul Razak, 2013). In addition, the digital economy through ICT is also able to benefit the community of digital entrepreneurs, small and medium industries, the B40 group and the youth (Abdul Razak, 2013).

The Use of Technology in E-Banking Transactions

The development of the digital economy in Malaysia continues to show a huge impact, especially on the local banking industry (Suganthi et al., 2001). This is because conventional banking is no longer able to meet all the current needs and wants of customers (Jamal & Jamil, 2016). As such, ICT has encouraged banking institutions to create alternative channels of other services through electronic banking (e-banking) such as Automated Teller Machines (ATM) and internet banking (Suganthi et al., 2001). In addition, customers no longer need to go to the bank to do financial transactions but instead only access internet banking at home (Bala & Vijayan, 2003).

According to Jamal and Jamil (2016), transactions through e-banking have shown that the amount of online payments is at a high level. This is because customers are more likely to use e-banking services to get more cost effective (Barry et al., 2002). In addition, easy operation is also an important aspect for users to use the service (Cooper, 1997). Therefore, e-banking is seen to have very bright prospects in the future and it is not impossible that it will be the main choice of users to deal with (Jamal & Jamil, 2016).

The rapid development in the e-banking ecosystem is predicted to continue to introduce new facilities to users (Shukri, 2019). This is because Malaysia is currently planning to establish a digital bank network in line with the steps taken by other developed countries (Ali, 2019). Therefore, digital banks will work to protect the e-banking system in addition to being targeted at underserved segments such as start-up companies and micro enterprises (Ali, 2019). In addition, digital banks will also offer new experiences with faster and easier services compared to traditional concepts (Shukri, 2019).

However, service quality in e-banking is difficult to measure compared to goods products (Parasuraman et al., 1985). This is because the user cannot see, touch or feel the service offered (Parasuraman et al., 1985). Therefore, an organization or bank must always strive to improve the ability and quality of service to meet the wishes and needs of customers (Khalil, 2011). This is because customer perception is very important for organizations involved in order to survive in the banking industry (Khalil, 2011).

As such, local commercial banks over the past few years are seen to be constantly competing to develop online banking applications more seriously (Taasim & Ali, 2013). This is in line with the choices and habits of online transactions by users (Lim, 2017). In addition, the study also found that the extent of use and dependence among users is increasing for mobile phones and tablets (Lim, 2017). Therefore, the banking applications available in the market generally have a variety of interesting functions compatible with the convenience of applications available in tablets and smartphones (Abllah, 2017).

Use of E-Wallet Technology in Malaysia

The use of smartphones nowadays has spread widely throughout the world to the point that it has become a necessity for some individuals (Rathore, 2016). In Malaysia, the percentage of household access to mobile phones remained at 98.2 percent in 2019 (Mahidin, 2020). This is because most smartphone users make various transactions through online services (Basaruddin, 2019). In addition, Malaysia is also seen to have recorded a high penetration rate for cashless payment services which is 67 percent (Basaruddin, 2019). Therefore, the good development of this electronic transaction finally created another new technology known as e-wallet (Chowdhury, 2019).

According to Mandeep Singh and Shabana Naseer Ahmad (2019), e-wallet is a new payment medium that is easy and can be used especially in financial matters. This is because the community has started making various types of e-wallet payments through smartphones (Rathore, 2016). Among the uses of this e-wallet is to pay bills, order food, transport services and so on (Salodkar et al., 2015). In addition, there are many e-wallet applications offered to users for different purposes (Salodkar et al., 2015).

The 3G, 4G and 5G technology provided by telecommunication companies also proved to help the use of e-wallets faster (Shukla, 2016). This is because users only need to make payments by accessing the internet (Shukla, 2016). According to Chauhan (2013), e-wallet users can make payments with various internet access including smartphone data, broadband facilities (wifi) in homes or public places. In addition, the e-wallet also has the feature of connecting to a bank account through the user's credit or debit card number, making it easy to add value (Rathore, 2016). Therefore, the e-wallet payment method is believed to be easier and safer for the public to use (Chauhan, 2013).

According to the Head of the Malaysian Statistics Department, Mahidin (2020), there are various age groups of users identified as using e-wallets. This is because 45.1 percent of individuals aged 25 to 29 prefer to order goods and services online. In addition, individuals aged between 35 and 39 years are more active in using services related to travel or accommodation (32.6%). However, the use of e-wallet is limited to users under the age of 21. This is because e-wallet top-up requires the monitoring of parents who have access to bank accounts to transfer money to children's e-wallet accounts (Chong, 2019). For that reason as well, the average e-wallet user account balance is between RM 10 to RM50 (Milo, 2018).

The use of e-wallets in Malaysia is seen to have increased in recent years (Iprice, 2019). This is because e-wallet technology receives continuous support from the government as well

as active marketing by various companies involved (Iprice, 2019). Therefore, the e-wallet technology that is introduced should be easy and fast to obtain and can be communicated to others (Ika Destiana et al., 2013). Therefore, many individuals will be able to make a choice and show different reactions to this e-wallet whether to accept or reject it (Straub, 2009).

User Behavior Towards the Acceptance of E-Wallet Technology

Every new technology that is introduced is expected to contribute to improving the quality of life as well as the challenges faced by society (Damanpour & Schneider, 2009). However, e-wallet technology is seen to have a different impact on users (Sahut, 2008). This is because an individual's behavior tends to change due to the rapid phase of technology (Mustaffa & Ibrahim, 2014). Therefore, it will lead to the division of community groups based on the mastery of a certain technology (Mustaffa & Ibrahim, 2014).

The behavior of a user is closely related to the intention within him (Rigopoulos & Askounis, 2007). According to Kim et al (2001), intention drives an individual's behavior to try a newly introduced technology. In addition, behavior is also influenced by an individual's intention to live in a modern era (Venkatesh, 2000). This means that if an individual has good intentions, then he will start to adapt to technology and use it gradually (Dastan & Gurler, 2016). According to Chern et al (2018), experience also affects the behavior of e-wallet users. This is because the individual's current behavior is influenced by past experiences whether good or bad (Yahaya et al., 2014). In addition, a somewhat backward thinking will also have a negative effect on the adoption of technology (Ram & Sheth, 1989). Therefore, the behavior of each individual will change according to the importance of technology that affects them before it is fully accepted in everyday life (Chern et al., 2018).

Social and environmental influences also influence an individual's behavior to try a new technology (Chua et al., 2020). This is because humans are easy to react when it comes to physical, cognitive, emotional and social behavior (Kostas et al., 2018). According to Chern et al (2018), an individual will act if he gets encouragement and support from his family or close acquaintances. This is because the individual concerned is easily influenced by other individuals to live in a modern world (Sudeep, 2007). Therefore, individual behavior is always driven by confidence and trust to change daily life like other people (Ram & Sheth, 1989).

E-wallet technology is considered an alternative choice for some individuals (Au & Zahar, 2008). This is because e-wallets have different interests for each individual (Taylor, 2017). In addition, the use of e-wallets is also considered a current trend and will not be used continuously (Lee, 2019). This is because many e-wallet users are still completely dependent on cash (Nair, 2018). Therefore, user behavior towards the use of e-wallet is seen to change from time to time (Laleh et al., 2016). However, it may turn into a necessity in daily life if it really brings benefits to users (Laleh et al., 2016).

Overall, the use of e-wallets in Malaysia is seen as a current trend and may not be used continuously (Lee, 2019). This is because there are also a few users who think that e-wallets are not useful enough for them even though they are easy to use (Abdul Kadir et al., 2019). In addition, there are some doubts about e-wallets among a large number of users (Singh & Ahmad, 2019). Therefore, e-wallets are accepted due to the attitude of users who just want to try something new (Lee, 2019)

Conclusion

This study can also contribute to general knowledge related to the behavior of a user in making a decision to accept or reject a new technology introduced. This is because e-wallets

have different interests for each individual (Taylor, 2017). Therefore, user behavior towards the use of e-wallet is seen to change from time to time (Laleh et al., 2016). However, it may turn into a necessity in daily life if it really brings benefits to users (Laleh et al., 2016).

Besides, it is also expected to give implications to the industry, especially the providers of e-wallet facilities and services to develop this technology in the future. In addition, banking and financial institutions can also practice e-wallet feedback submitted by users. This is because the information included in this study can provide guidelines on user behavior as well as important steps that need to be taken to increase the acceptance of e-wallets among users.

In addition, industry players can also intensify the promotion of the advantages of e-wallet to the general public to increase awareness among users. This is because many e-wallet users are still completely dependent on cash. Therefore, the rapid development of e-wallet technology in Malaysia is seen to be able to have a great impact on society if it is implemented correctly and effectively. This is to ensure the continuity of the e-wallet service as well as improve the position of the business in the local market.

Future researchers who are interested in studying the factors that influence the adoption of e-wallets can take some advantages from this study. In addition, other researchers can also use qualitative methods to get feedback closely from the respondents involved or use combined methods. This is because qualitative data can provide clear descriptions and explanations that show the chronological flow of events and always provide (opportunities for) better discoveries. According to Miles and Huberman (1994), qualitative research has an 'undeniable' quality because it has more than one concrete word and is clearly more convincing to the reader than numbered pages.

Further research can also be done by looking at the effectiveness of e-wallet on smartphone users in other states, especially rural areas. This is because they are also important users who contribute to increasing national income through the use of e-wallets. The results obtained then to some extent can help in improving the quality and strengthening the e-wallet technology by the service provider. Furthermore, this study can also be used as a reference source for e-wallet industry players in an effort to face IR 4.0 in addition to expanding the number of users and merchants.

Overall, this study can provide new benefits as well as exposure about the convenience of e-wallet to the general public covering various layers of society. This is because e-wallet is still seen as a new thing to be accepted by the entire community in this country. However, e-wallets will still be accepted if they make it easy and safe for people to use the technology no matter where they are.

References

- Haque, A., Al Mahmud, S., Zaki, A., & Tarofder, A. K. (2007). Internet advertisement in Malaysia: A study of attitudinal differences. *EJISDC*. 31(9):1-15.
- Alias, A. (2018). Malaysia's Internet penetration is now 85.7 per cent. <https://www.nst.com.my/business/2018/03/346978/malaysias-internet-penetration-now-857-cent>.
- Saad, A., & Daud, E. D. (2016). Kepelbagaian model penerimaan teknologi dan sistem maklumat. *International Conference on ICT in Education*.
- Au, Y. A., & Zahar, H. (2008). A multi-country assessment of mobile payment adoption. <http://business.utsa.edu/wps/IS/0055IS-296-2008.pdf>.
- Aubert, J. E. (2005). Promoting innovation in developing countries: A conceptual framework. *World Bank Policy Research Working Paper*.

- Yahaya, A., Boon, Y., Ramli, J., Latif, J. S., Yahya, F., & Abdul, A. H. (2004). *Psikologi Sosial*. Johor Bahru: Universiti Teknologi Malaysia.
- Bala, S., & Vijayan, P. (2003). Service Quality Evaluation Of Internet Banking In Malaysia. *Journal of Internet Banking of Commerce*.
- Barry, H., Rober, H., & Paul. (2002). Consumer Attitude And The Usage And Adoption Of Home-Based Banking In The United Kingdom. *International Journal of Bank Marketing*. 16: 15-23.
- Boudraeu, M. C., & Watson, R. T. (2006). Internet Advertising Strategy Alignment. *Internet Research*. 16(1): 23-37.
- Chauhan, P. (2013). E-wallet: The Trusted Partner In Our Pocket. *International Journal for Research in Management and Pharmacy*.
- Chern, Y. X., Kong, S. Y., Lee, V. A., Lim, S. Y., & Ong, C. P. (2018). *Moving into cashless society: factors affecting adoption of e-wallet*. Kuala Lumpur: Final Year Project, UTAR.
- Chong, J. (2019). The war of Malaysia's e-wallets. <https://www.warc.com/Newsandopinion/news/the-war-of-malysias-e-wallets/42990>.
- Chowdhury, D. (2019). E-dompert mula diterima. <https://www.hmetro.com.my/bisnes/2019/07/473185/e-dompert-mula-diterima>.
- Chua, C. J., Lim, C. S., & Aye, A. K. (2020). Consumers' behavioural intention to accept of the mobile wallet in Malaysia. *Journal of Southwest Jiaotong University*.
- Cooper, R. G. (1997). *Examining some myths about new product winners*. Oxford: The Human Side of Managing Technological Innovation.
- Damanpour, F., & Schneider, M. (2009). Characteristics Of Innovation And Innovation Adoption In Public Organizations: Assessing The Role Of Managers. *Journal of Public Administration Research and Theory*. 19(3): 495-522.
- Daştan, I., & Gurler, C. (2016). Factors Affecting The Adoption Of Mobile Payment Systems: An Empirical Analysis. *Emerging Markets Journal*. 6(1): 16-24.
- David, N. A. (2001). *Malaysia and the K-economy: Challenges, solutions, and the road ahead*. Kuala Lumpur: Pelanduk Publication.
- Rashid, F. (2019). Pasca Belanjawan 2020: Atasi masalah struktur ekonomi sedekad lalu. <http://www.astroawani.com/berita-malaysia/pasca-belanjawan-2020-atasi-masalah-struktur-ekonomi-sedekad-lalu-220573>.
- Flecknoe, M. (2008). ICT doing different things, rather than doing the differently. *Management in Education*. 16(1): 26-30.
- Holmes, D. (2005). *Communication Theory: Media, Technology and Society*. London: SAGE Publications.
- Bajunid, I. A. (2005). *Pendidikan sepanjang hayat; cabaran revolusi cara fikir dan cara hidup kualiti tinggi*. Kuala Lumpur: Persekutuan Badan Pendidikan dan Pembangunan Melayu.
- Iprice. (2019). E-dompert aplikasi paling aktif diguna di Malaysia. <https://www.bharian.com.my/bisnes/teknologi/2019/10/623187/e-dompert-aplikasi-paling-aktif-diguna-di-malaysia>.
- Luaran, J. E. (2013). Perkembangan, cabaran dan aplikasi teknologi maklumat dalam pengajaran dan pembelajaran di Malaysia. https://www.academia.edu/15992543/perkembangan_cabaran_dan_aplikasi_teknologi_maklumat_dalam_pengajaran_dan_pembelajaran_di_malaysia.
- Jorgenson, D. W., & Vu, K. M. (2016). The ICT revolution, world economic growth, and policy issues. *Telecommunications Policy*. 40(5): 383-397.

- Kamara, A. B., Bourish, L., & Nyende, M. (2007). Growing a knowledge-based economy: evidence from public expenditure on education in Africa. *Economic Research Working Paper*. 88.
- Khalil, K. M. (2011). Online service quality and customer satisfaction: a case study of Bank Islam Malaysia Berhad. *Munich Personal RePEc Archive*. 1-22.
- Kim, D. -J., Braynov, S. D., Rao, H. R., & Song, Y. (2001). *A B-to-C trust model for online exchanges*. Boston: Proceedings of the Seventh Americas Conference in Information Systems.
- Laleh, J., Ramin, M., Hyungik, O., & Ramesh, J. (2016). *Human behavior analysis from smartphone data streams*. Amsterdam: HBU. Proceedings. 68-85.
- Lee, J. (2019). Getting small merchants on the digital payment wagon. <https://www.thestar.com.my/business/smebiz/2019/04/15/getting-small-merchants-on-the-digital-payment-wagon>.
- Lim, R. (2017). Pengguna perbankan dalam talian meningkat 106 peratus. <https://www.bharian.com.my/bisnes/lain-lain/2017/09/329908/pengguna-perbankan-dalam-talian-meningkat-106-peratus>.
- Mohamed, M. (1998). *Multimedia Super Corridor*. Subang Jaya: Pelanduk Publication (M) Sdn. Bhd.
- Mohamed, M. (2002). Menggalakkan lebih ramai rakyat agar celik computer. http://lib.perdana.org.my/PLF/Digital_Content/Prominent_Leaders/Mahathir/News_1968-2004/2001005/2002ko/menggalakkan%20lebih.PDF.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook (2nd Ed.)*. California: Sage Publications, Inc.
- Milo, E. C. (2018). The e-wallet usage statistics by Carousell Malaysia. <https://news.ecinsider.my/2018/12/ewallet-usage-statistics-carousell-malaysia.html>.
- Mohnen, P. (2005). Complementarities in Innovation Policy. *European Economic*.
- Abdul Razak, M. N. (2013). ICT perkhidmatan, e-Perdagangan penyumbang terbesar ekonomi digital Malaysia. <http://www.astroawani.com/berita-malaysia/ict-perkhidmatan-e-perdagangan-penyumbang-terbesar-ekonomi-digital-malaysia-25455>.
- Ishak, M. S. (2014). Pemodelan Penerimgunaan Maklumat Berkaitan Islam Di Internet: Pengaplikasian Model Penerimaan Teknologi (Tam). *Journal of Techno Social*. 6(2).
- Mahidin, M. U. (2019). Information and Communication Technology Satellite Account. https://www.dosm.gov.my/v1/index.php?r=column/cthemByCat&cat=319&bul_id=UWpOUFBQsjk2TDhJNXFwUFhJZHNEUT09&menu_id=TE5CRUZCb1h4ZTZMODZlbnk2aWRRQT09.
- Mahidin, M. U. (2020). Malaysian households access to Internet rose to 90.1% end-2019. <https://www.thestar.com.my/business/business-news/2020/04/10/malaysian-households-access-to-internet-rose-to-901-end-2019>.
- Basri, M. (2015). *Jurang digital dan kesan terhadap perkembangan K-Ekonomi*. Selangor: Kolej Universiti Islam Antarabangsa.
- Abu Hassan, M. (2002). *Peranan dan penggunaan ICT di kalangan masyarakat*. Serdang: UPM.
- Basaruddin, N. (2019). E-dompot mula diterima. <https://www.hmetro.com.my/bisnes/2019/07/473185/e-dompot-mula-diterima>.
- Nair, V. (2018). *The Star Online*. Donate to mosques the QR code way. <https://www.thestar.com.my/metro/metro-news/2018/06/11/donate-to-mosques-the-qr-code-way-iconic-masjid-jamek-the-first-to-adopt-banks-cashless-donation-con/>.

- Jamal, N. M., & Jamil, H. K. (2016). Tahap penggunaan dan halangan perbankan internet (Maybank2u) di kalangan pelanggan. http://eprints.utm.my/id/eprint/1439/3/NorizaMohdJamal2006_TahapPenggunaanHalanganPerbankanInternet.pdf.
- Ahmad, N. A., Ab. Halim, K., & Othman, Z. (2014). Potensi penerima guna inovasi pertanian di kalangan petani. *Prosiding PERKEM*. 311-320.
- Abllah, N. (2017). Pengguna perbankan dalam talian meningkat 106 peratus. <https://www.bharian.com.my/bisnes/lain-lain/2017/09/329908/pengguna-perbankan-dalam-talian-meningkat-106-peratus>.
- Azmi, N. F., & Peng, L. W. (2014). Factors Influencing The Intention For Online Purchasing: A Study Among University Students In Malaysia. *International Journal of Management Sciences*. 4(2): 69-74.
- OECD. (2006). *Science and Technology and Industry Outlook*. Paris: Economic Co-operation and Development.
- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A Conceptual Model Of Service Quality And Its Implications For Future Research. *Journal of Marketing*. 49: 41-50.
- Perry, N., & Sherlock, D. (2008). *Quality Improvement in Adult Vocational Education and Training: Transforming Skills for the Global Economy*. London: Kogan-Page.
- Ram, S., & Sheth, J. (1989). Consumer Resistance To Innovations: The Marketing Problem And Its Solutions. *Journal of Consumer Marketing*. 6(2): 5-14.
- Raman, K. (2018). Transformasi digital akan jana AS\$10 bilion kepada KDNK Malaysia pada 2021. <http://www.astroawani.com/berita-bisnes/transformasi-digital-akan-jana-10-bilion-kepada-kdnk-malaysia-pada-2021-167541>.
- Rathore, H. S. (2016). *Adoption of digital wallet by consumers*. Mumbai: Bharati Vidyapeeth's Institute of Management Studies & Research.
- Rigopoulos, G., & Askounis, D. (2007). A TAM framework to evaluate users adoption behaviour towards online electronic payments. *Journal of Internet Banking and Commerce*. 12(3): 1-6.
- Rogers, E. M. (1993). *Communication Technology: New Media in Society*. New York: The Free Press.
- Roman, S., & Riquelme, I. P. (2014). Personal Determinants Of Online Shopping Frustration And Its Influence On Consumers' Positive Word Of Mouth. *Journal of Electronic Commerce Research*. 15(2): 87.
- Abd Rahman, R., Basri, M., Husain, K., Ahmad, W. C. W. S. B. C., & Danuri, M. S. N. M. (2017). Teknologi Maklumat Dan Komunikasi (ICT) Dalam Kehidupan Insan: Integrasi Konsep Dualiti (Konvensional Dan Islam) Dalam Silibus Kursus Pengantar IT. *Jurnal Sultan Alauddin Sulaiman Shah*. 4(1): 1-10.
- Sahut, J. M. (2008). The Adoption And Diffusion Of Electronic Wallets: The Case Of Monéo. *Journal of Internet Banking and Commerce*. 13(1): 13-20.
- Salmi, H. (2005). *Globalization and the knowledge based-economy from a european perspective*. PA: Information Science Publishing.
- Salodkar, A., Morey, K., & Shirbhate, M. (2015). Electronic Wallet. *International Research Journal of Engineering and Technology (IRJET)*. 2(9): 1-10.
- Taasim, S. I., & Ali, H. (2013). Penerimaan Pengguna Terhadap Kaedah Pembayaran Elektronik. *Jurnal Ekonomi Malaysia*. 47(1): 3-12.
- Shukla, T. N. (2016). Mobile Wallet: Present And The Future. *International Journal in Multidisciplinary and Academic Research (SSIJMAR)*. 5(3): 20-28.

- Siegler, A. (2007). European International Scientific in 7th Program. *European Commission Community Research*.
- Stewart, R. (2008). *The Industrial Revolution*. London: Evans Brothers Limited.
- Straub, E. T. (2009). Understanding technology adoption: Theory and future directions for informal learning. *Review of Educational Research*. 79(2): 625-649.
- Sudeep, S. (2007). *Internet banking and customer acceptance: The Indian scenario*. Cochin: PhD thesis, Cochin University of Science and Technology.
- Suganthi, R., Balachandher, K. G., & Balachandran, V. (2001). Internet banking patronage: An empirical investigation of Malaysia. *Journal of Internet Banking and Commerce*.
- Ali, S. (2019). Penubuhan bank digital sihat untuk ekosistem perbankan – MDEC. <https://www.bharian.com.my/bisnes/lain-lain/2019/06/576129/penubuhan-bank-digital-sihat-untuk-ekosistem-perbankan-mdec>.
- Shukri, S. (2019). Penubuhan bank digital sihat untuk ekosistem perbankan – MDEC. <https://www.bharian.com.my/bisnes/lain-lain/2019/06/576129/penubuhan-bank-digital-sihat-untuk-ekosistem-perbankan-mdec>.
- Taylor, J. (2017). The differences between each living generation. <https://www.theodysseyonline.com/the-differences-between-each-of-the-living-generations>.
- Venkatesh, V. (2000). Determinants Of Perceived Ease Of Use: Integrating Control, Intrinsic Motivation, And Emotion Into The Technology Acceptance Model. *Information System Research*. 11(4): 342-365.
- Venkatesh, V., Morris, M. G., & Davis, G. B. (2003). User acceptance of information technology: toward a unified view. *MIS Quarterly*. 27(3). 425-478.
- Wolfenbarger, M., & Gilly, M. (2001). Shopping online for freedom, control, and fun. *California Management Review*. 43(2): 34-55.
- Yuliasri, M. A. I., & Daud, K. A. K. (2011). Factors That Influence Customers' Buying Intention On Shopping Online. *International Journal of Marketing Studies*. 3(1): 128-139.
- Zendeled, M., & Paim, L. (2013). Predicting Consumer Attitude To Use On-Line Shopping: Context Of Malaysia. *Life Science Journal*. 10(2): 497-501.