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Conceptual Framework: The Determinant Factors of Intention to Use Interactive Kiosk Technology in The Museum

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ABSTRACT
Interactive kiosk technology (IKT) has become one of the most popular learning tools in the museum sectors because of the effectiveness to increase the level of experience and cognitive engagement among the visitors. However, not all the visitors are interested to use the IKT provided caused by several factors that have been revealed by the previous studies. Based on the content analysis from an extensive literature review of Technology Acceptance Model (TAM) studies, this paper proposes a conceptual framework with highlighting the relationship between the belief factors (perceived usefulness, perceived ease of use) and design factors (system support, user interface design, navigation, accessibility, and comfortability) towards the intention to use the IKT in the museum. Theoretically, this paper contributes to the new perspective and understanding of the technology adoption study in the museum setting for further research.

Keywords: interactive kiosk; technology adoption; museum; design; conceptual framework.

1. INTRODUCTION

The Industrial Revolution 4.0 (IR4.0) agenda in Malaysian government policy emphasised the importance of the digital approach for formal and informal educational institutions (Robandi, Kurniati, & Puspita Sari, 2019). Realised on the importance of interactive technology for museum institutions, The Minister of Culture, Arts, and Heritage of Malaysia has challenged Malaysia's museums to comply and stand with another museum in the world (Saidin, Alwi, & Shaari, 2018). Thus, the idea of using IKT has been brought into Malaysian museums, which offer a different set of applications such as games, multimedia presentations, and interactive books (Nizar, Rahmat, Nabihah, & Nizar, 2018). The IKT was implemented in the Malaysian museum as an active and supportive learning tool to enhance the visitors' learning experiences.

The IKT was selected to be the focus technology device in this research because of the enormous investment was made by the Malaysian government (Jabatan Muzium Malaysia, 2018), the high impact of the implementations on museum learning (Burmistrov, 2015; Kidd, Ntalla, & Lyons, 2011; Saidin et al., 2018), the potentials to be developed (Saidin et al., 2018), and the limited of local studies on the related topic.

There is no doubt that the use of IKT in the museum effectively increases the level of experience and cognitive engagement among the visitors (Pallud, 2017). The effectiveness of IKT usage also has been confirmed in many places of implementations: shopping mall (Rajendran, 2018); retail business activities (H. J. Lee, Fairhurst, & Cho, 2013); health services and hospitality (Abraham, Patel, & Feathers, 2018; Kim & Qu, 2014; Ujang et al., 2016), and; museum exhibition (Burmistrov, 2015; Gonçalves, Campos, & Sousa, 2012; Johari, Roni, Ahmad, & Hasim, 2010; Lo, Tsai, Chen, & Hung, 2004).

However, the problem is aroused when not all visitors are interested in adopting the IKT provided in the museum (Burmistrov, 2015). The rejection to use IKT is a big challenge for Malaysian museum authorities in ensuring the IKT provided is fully utilised by their visitors. Moreover, there is a lack of established research regarding this issue in the local context. The museum sector is expected to maximise technology's full potentials in embracing the IR4.0 and Sustainable Development Goals (SDGs). Unfortunately, the study on technology adoption for the museum sector in Malaysia seems to be marginalised recently. The latest reviews for technology adoption in Malaysian museum only resulting in a paper for the late three years ago in the Google Scholar database (Nizar et al., 2018). Thus, new research is needed to help the Malaysian museum sectors in understanding how the IKT can be adopted by the visitors from a new perspective.

2. LITERATURE REVIEW

2.1 Technology Acceptance Model (TAM)

TAM model has been used widely applied to a diverse set of technologies in various research disciplines from 1986 until today because the theoretical relationship is simple and easy to understand (Dugar, 2018; King & He, 2006). Moreover, TAM has been mostly used amongst all models and theories related to technology acceptance because of its consistency and validity in explaining the usage behaviour in different contexts (Liu & Yu, 2017). Based on the extensive literature review, a new conceptual framework is proposed, which is an extension of the TAM model, subsequently provides a better explanation for the hypotheses proposition of this research.

2.2 User belief factors on the Technology Usage Intention

The individual differences in beliefs are a critical assumption on technology usage. The empirical evidence on the belief impact has been reported by numerous researchers in technology adoption studies (Hill, Fishbein, & Ajzen, 1977; Hsu & Lu, 2004; B. C. Lee, Yoon, & Lee, 2009; Mc Knight, Choudhury, & Kacmar, 2002; Porter & Donthu, 2006; Scherer, Siddiq, & Tondeur, 2019). Certain studies also focus on the extension of the belief factors because of the high significance of technology acceptance (Hsu & Lu, 2004).

Generally, the belief factors of Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) may increase the technology use because of the impacts on job productivity, performance, effectiveness, profitability, save time and money, and eventually enhance living quality (Davis, 1989). This prediction theory has been confirmed by Ying Chieh et al. (2012) towards the IKT devices as the self-service technology. However, PU and PEOU need to be replicated and reconfirmed for different research models. Therefore, the belief factors were adopted and discussed in the conceptual framework of this research

2.3 Design Factors on the Technology Usage Intention

Design in this research context is referring to the technical ‘‘design and functionality’’ of IKT in the museums (Chin, 2016; Chin & Ahmad, 2015; Szymanski & Hise, 2000). Davis (1989) has indicated that the design features have an impact to perceived ease of use and perceived usefulness of technology, subsequently increasing the technology acceptance. Other researches also have proved that design values make the user enjoy using the interactive technology because of the benefits to the ease of use and usefulness (Chin, 2014; Lin & Hsieh, 2006). For example, Szymanski and Hise (2000) had found that the easier design features increase the attraction of consumers to use the online shopping system. In similar findings, the online shopping site's design significantly influences the consumers’ intention to use the system rapidly (Belanger, Hiller, & Smith, 2002; Mc Knight et al., 2002). Design features were also confirmed to directly affect behavioural intentions in other technology adoption studies (Fikri & Ramadhan, 2011).

3. CONCEPTUAL FRAMEWORK

The researcher proposes a conceptual framework as shown in Figure 1 to visualize how this study's ideas are interrelated with each other within the theory understanding. TAM was adopted with a general understanding that the belief factor and design factor significantly affected the usage intention in the technology adoption phenomenon. After an extensive literature review been conducted, the researcher proposes seven determinant factors that potentially affect to the IKT usage intention in the museum: (1) perceived usefulness; (2) perceived ease of use; (3) system support; (4) user interface design; (5) navigation; (6) accessibility, and; (7) comfortability.

TAM originally has attitude variable as a mediator between the belief constructs and intention to use. However, the attitude was excluded by Venkatesh and Davis (1996, 2000) in the final version of TAM and TAM2 because of the weak role as mediator, subsequently theorized a direct relationship between the determinant factor and usage intention (Yi et al., 2006). Some of the studies also modified and used TAM without positioning the belief factors; perceived usefulness (PU) and perceived ease of use (PEOU) as the moderating effects between the external factors towards usage intention (Kamal et al., 2020; Shahbaz, Gao, Zhai, Shahzad, & Hu, 2019; Ying Chieh et al., 2012). Although this relationship format is not the original format in TAM, it has been employed in recent studies and capable of providing a new perspective for prediction compared to the TAM's traditional way. Hence, this study adopts the TAM model without attitude towards use, actual usage, and moderating effects between the determinant factors and usage intention. All factors are linked for a direct relationship toward usage intention, except the PEOU.

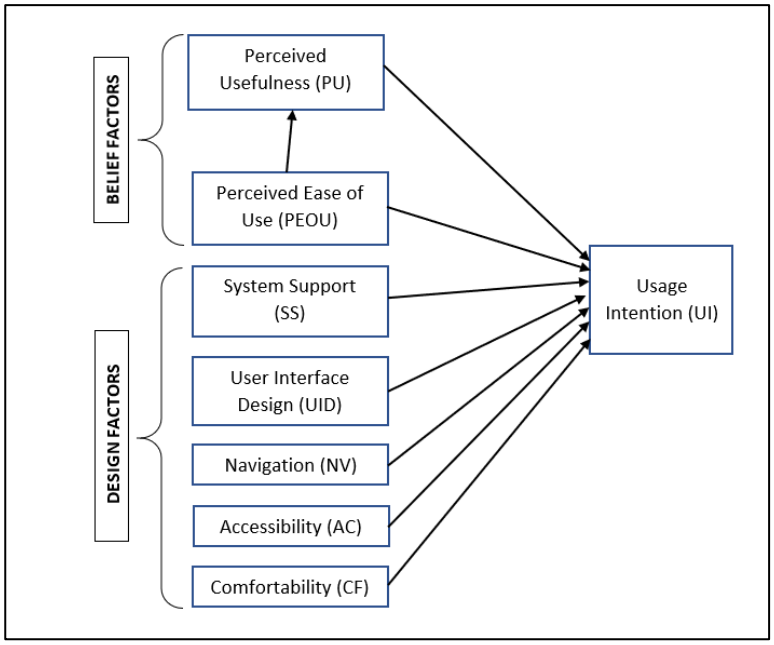

Figure 1: Conceptual Framework

3.1 Usage Intention (UI)

Behavioural intention is directly associated with technology usage (Davis, 1989) because it is the main predictor of behaviour (Marangunić & Granić, 2015). Johari et al. (2010) recommend that the researchers study behavioural intention to translate the actual use of technology. Parallel opinion with Ayala and Henderson (1995), it is essential to understand the behaviour and attitude towards using to understand the acceptance or rejection better to use the IKT technology.

The constructs of behavioural intentions originally come from the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1969). The construct was adopted into TAM and extended by many researchers until it became an important dependent variable in a technology adoption study. There are several terms been used for the same construct meaning in various technology adoption studies: behavioural intention (Prieto, Migueláñez, & García-Peñalvo, 2014; Tsai, Chang, Chen, & Chang, 2017); behavioural intention to use (Shahbaz, Gao, Zhai, Shahzad, & Hu, 2019); intention to use (Davis, Bagozzi, & Warshaw, 1989; Ying Chieh et al., 2012); purchase intentions (Belanger et al., 2002); consumer's intention to use (Tan, 2019); intention to continue purchase (Boakye, McGinnis, & Prybutok, 2014), and; usage intention (Kamal, Shafiq, & Kakria, 2020). Usage intention or intention to use can be interpreted as user willingness to use the technology or system (Mardiana, Tjakraatmadja, & Aprianingsih, 2015). Thus, the researcher adopts the terms "usage intention" from the latest study (Kamal et al., 2020) as the dependent variable in this conceptual framework.

3.2 Perceive Usefulness (PU)

According to TAM's founder, PU is the degree to which a user believes that using technology would enhance their job performance (Davis et al., 1989). In this research, the visitors form intention toward using the IKT based on their cognitive judgement of how the IKT will improve their learning performance in the museum setting.

The museum can be defined as a storehouse of knowledge (Bello, Rotimi-williams; Mohamed, 2018). Therefore, the use of technology is useful as the supportive learning tools and facilitates the museums' tour activities. Interactive technology is useful for knowledge transmission and increasing the multi-level performance in museum exploration (Allen & Lupo, 2012). Various innovative technological learning aids in museums are useful for museum learning in enhancing visitors' visiting experiences (Pop & Borza, 2016).

3.3 System Support (SS)

There are several definitions been given on the system support factor from previous studies. System support was defined as the perceived effectiveness of system support for a system (Cho, Cheng, & Lai, 2009). Similarly, system support is also referred to as the technical and customized support to access the needed information without difficulties (Wilkinson, Forbes, Bloomfield, & Fincham Gee, 2004). This research adopts the definitions summarized by Tsai et al. (2017), where the system support was well-defined as "the perceived effectiveness of system support at avoiding and recovering from errors". This factor explains that a good system support of the user interface helps users avoid making errors when operating the IKT and consequently enhance the usage intention.

3.4 User Interface Design (UID)

The user interface design (UID) is related to the visual appearance of the system and menu design features such as layout arrangement, icons, colour schemes, buttons, fonts, control bar, and screen design (Eraslan Yalcin & Kutlu, 2019; Graham, Hannigan, & Curran, 2005). Numerous researchers had found that the usability of UID is one of the factors that affect end-user satisfaction (Gupta, Priyadarshini, Massoud, & Agrawal, 2004; Matolcsy, Booth, & Wieder, 2005; Park & Hwan Lim, 1999). Subsequently, the usability of the UID also increased users' intentions towards a technology (Scholtz, Mahmud, & Ramayah, 2016). Therefore, the researcher defines the UID as the degree of the beneficial and usefulness feeling of users towards the technological characteristics in the visual appearance and menu design features of the system (Eraslan Yalcin & Kutlu, 2019; Mouakket & Bettayeb, 2015).

3.5 Navigation (NV)

Several studies reported that a complex navigation system is the main cause of disorientation feeling, which subsequently increases the users' cognitive load (Dillon, 2000; Marchionini, Plaisant, & Komlodi, 1998). Supported by a finding from Tsai et al. (2017), the navigation features in UID have a high positive effect on the usage intention via the belief factors. Thus, this research predicts a direct effect between the navigation towards the usage intention without the belief factors as the moderation effects. Adapted and modified from Tsai et al. (2017), the navigation factor is defined as the easiness level of navigation features to access the information from the UID.

3.6 Accessibility (AC)

Several technology adoption studies used the accessibility factor to measure the systems' effects on the attitude and usage intention (Karkonasasi, Yu-N, & Mousavi, 2018; Saenphon, 2017). As mentioned by Moore and Benbasat (1991), accessibility means the user's capability to access a system through a communication network or without being restricted by space or time. The definition same goes for Saenphon (2017), the accessibility refers to the degree of ease, which a user can access and use the system as an organizational factor.

3.7 Comfortability (CF)

Typically visitors spend less than 20 minutes for certain museum exhibitions depending on topic and size (Serrell, 1997) and spend less than 10 minutes using a multimedia program in a public gallery (Economou, 2008). However, the period of interaction might increase if the visitors attracted to the topic given. Several studies have found that certain failure on the physical design of interactive technologies has caused body discomfort and physical loads to the users if the interaction occurs over a long period (Kang & Shin, 2014; Parikh & Esposito, 2012; Shin & Zhu, 2011). A recent study has empirically proved that an ergonomic and comfort design significantly affects the intention to use a technology (Turja et al., 2020). Therefore, the user needs to feel easy and comfortable to use the technology. As mentioned by Pujol-Tost (2011), comfortability is the most important factors to understand the physical design for specific users.

4. CONCLUSION

Previous studies have showed that the relationship of variables in TAM can be different depending on the technology devices and research field. The inconsistency of TAM findings makes it reasonable to be replicated and reconfirmed for different research contexts. Based on the literature review, it was found that the belief factor and design factor are significant towards intention to use a technology device. Therefore, this paper has proposed a conceptual framework to help the future researcher to understand the research phenomenon, exploring the research problems, identify the specific direction to take, and test the new format of relationships between the variables for the interactive kiosk technology in the museum. The conceptual framework explained that the adoption of interactive kiosk technology in the museum could be interpreted by the usage intention behaviour. Whereas the usage intention is driven by seven determinant factors that derived from belief and design dimensions: (1) perceived usefulness; (2) perceived ease of use; (3) system support; (4) user interface design; (5) navigation; (6) accessibility; and (7) comfortability.

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