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The Influence of Big Five Personality Traits and Technology Readiness on the Intention to Use an E-commerce Application: A Theoretical Review

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ABSTRACT

This study proposes a conceptual framework to examine the effects of five personality traits and technology readiness (TR) on the intention to use an e-commerce application. This article comprehensively analyses the current literature on e-commerce and purchase intent. It also includes a review of personality, acceptance, and TR theories. Using subjective fact-finding, this study proposes a conceptual framework that establishes a connection between these factors. The results indicate that there is the integration of the Big Five personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism) and the four dimensions of TR (discomfort, innovation, optimism, and insecurity) and their impact on the purchase intent of e-commerce applications and thus underlining the realisation of the Technology Readiness and Acceptance Model (TRAM). Most previous studies focused on the external factors affecting the intention to use e-commerce applications, and the remaining internal factors constitute a scientific gap. Therefore, researchers are encouraged to test the proposals for the generalizability of the findings. This article includes the psychological impacts that benefit e-commerce companies on customers' usage of e-commerce applications, facilitating the development of services based on customer demands to enhance the dynamics of commerce in society. The social effects of this study are characterised by the discovery of personalities that are more inclined to use e-commerce and the importance of this commercial field for entrepreneurs to market their products and services well. The study expands the literature by increasing our understanding of personality when adopting e-commerce applications.

Keywords: big five personality traits, technology readiness and acceptance model, purchase intention, e-commerce

INTRODUCTION

One of the most essential global developments is e-commerce, which has advanced intensely during the last decade and become a pillar of the new economic system that centres on the Internet to promote products. The growth of the revenue obtained from the e-commerce market will reach USD4,117.00 billion in 2024, depicting a yearly growth rate of 9.49 per cent, leading to a projected market volume of USD6,478.00 billion in the year 2029 (Statista, 2024). A study found that artificial intelligence (AI) has improved the efficiency of e-commerce companies that are investing significantly in AI in the future to help their businesses develop further (Lari et al., 2022). However, not all businesses have been quick in adopting e-commerce strategies due to the challenges companies face, including the lack of technical knowledge and financial strength (Ma et al., 2022); thus, it has been a relatively slow process.

E-commerce

Any transactions that are conducted online between a company and a customer are called e-commerce (Azhari et al., 2023). Electronic commerce, or e-commerce, refers to the marketing, ordering, payment, distribution, and support of physical and digital goods and services conducted entirely through the Internet (Lestari et al., 2020). E-commerce allows customers to purchase whenever they like conveniently and provides sellers with a method of selling globally (Taher, 2021). Initially, e-commerce only referred to the online money exchange between sellers and buyers for products and services. However, attitudes about online shopping have since shifted. In modern parlance, e-commerce refers to any business dealings that involve the use of the Internet as a mediator. Therefore, non-monetary transactions such as consumer inquiries online now fall within the e-commerce umbrella (Cabrera-Sánchez et al., 2021). According to the writers, the contemporary term for e-commerce involves everything on the website, from browsing and purchasing goods to exchanging information with customers and making payments. E-commerce uses a gadget that provides access to the Internet, usually the computer, with mobile e-commerce as an extension of e-commerce by enabling online transactions via mobile devices and computers (such as smartphones and tablets) (Reardon et al., 2021). In 2014, e-commerce expanded instantly, and mobile Internet access surpassed fixed internet access (Kotane et al., 2019).

E-commerce involves banking, travel reservations, and shopping transactions initiated and/or entirely utilising mobile access to computer-mediated networks with the assistance of mobile gadgets (Dumanska et al., 2021). E-commerce practices through mobile devices are collectively popularly known as mobile shopping, and they are embraced by modern consumers who want to peruse, order, or pay for products utilising a mobile device (Maduku & Thusi, 2023). M-shopping is the embrace of wireless Internet service for shopping activities using a mobile device (Patil et al., 2020).

E-commerce in Malaysia

In Malaysia, e-commerce flourished significantly during the Movement Control Order (MCO), the period of the COVID-19 pandemic and soon after (Azhari & Yusof, 2023). The Malaysian Communications and Multimedia Commission (MCMC) has been mandated to move the country forward on the path of digital transformation by helping her to transform into a high-income digital one, which requires spreading willingness and acceptance to encourage the embrace of the digital transformation development by the Malaysian society (Malaysian Communications and Multimedia Commission (MCMC), 24 August 2022). Researchers are expanding their study of e-marketing to include audience opinions and reactions and the elements that influence the consumer on smartphones (Stocchi et al., 2022). Recent research studies have centred on the trends and e-commerce applications on adoption behaviours. Malaysian e-commerce revenue is anticipated to depict a yearly growth rate (CAGR 2024-2029) of 11.25 per cent, leading to a forecasted market volume of USD 13.43 billion by 2029 (Statista, May 2024).

According to the Department of International Trade, the Malaysian government has admitted the growth of e-commerce in the country and has supported small and medium enterprises' embrace of e-commerce (Mentek, 2022). Moreover, through government support, the Malaysia Digital Economy Corporation (MDEC) was formed in 1996 under the Ministry of Digital's purview to lead Malaysia's digital economy and bolster the nation as the digital hub of ASEAN (Malaysia Digital Economy Corporation (MDEC), 2024). MDEC has also drawn the National E-Commerce Strategic Roadmap (NESR) to encourage a "collaborative approach between the public and private sectors to enhance and accelerate growth and innovation of Malaysia's e-commerce ecosystem" (Malaysia Digital Economy

Corporation (MDEC), 2022). Considering this, e-commerce promises the future success of markets and raises commercial dynamism, which means that this field is essential for future research studies.

Development of TRAM

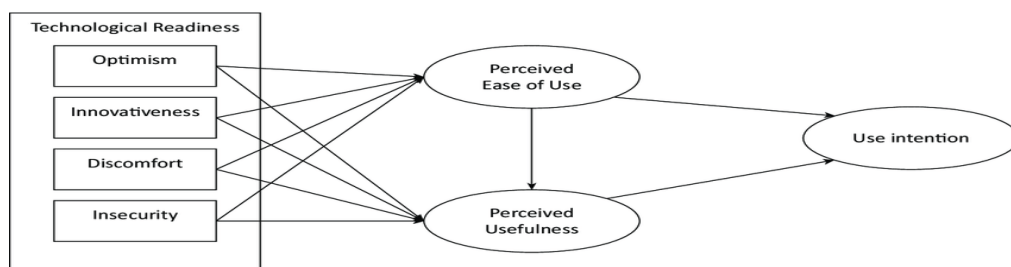
The Technology Acceptance Model (TAM) alone may not be sufficient to explain consumers’ technology adoption behaviours. To identify and examine the mental processes that impact a person’s evaluation of a technology’s worth, it may be required to include factors of individual differences in the model. To address this need, Jin (2020) recommends the TAM extension, that is, the Technology Readiness and Acceptance Model (TRAM), to factor in personality traits that influence the technology readiness index through the Technology Readiness Index (TRI) or Technology Readiness (TR). TRI is denoted as a person’s general thought about technology (Parasuraman, 2000) and is an individual’s propensity to adopt and utilise new technologies (Lai & Lee, 2020).

Theoretically, the TR can be combined with TAM because they share the acceptance factor albeit differ conceptually in that TRI refers to individuals’ general dispositions of technology acceptance (individual specific). At the same time, TAM uses perceptions that are particular to a system to elucidate technology acceptance. TRAM was validated by Lin et al.’s (2007) study. Generally, consumers engage in an internal search through recall (Bettman, 1979). As a result, people’s general beliefs about technology obtained from experience may produce ease of use and perceptions of its usefulness. People’s prior beliefs, fashioned through expertise, are also crucial in directing information processing and behaviour (Afonso et al., 2018). Based on prior beliefs saved in the memory, expectations of consumers can impact consumers’ perceptual encoding or interpretation of promotional information.

Parasuraman and Colby (2007) have portioned the TR construct into four variables: optimism, innovativeness, discomfort, and insecurity. Scholars classify optimism and innovativeness as action enablers, while discomfort and insecurity are inhibitors. Blut and Wang (2020) recommend that the four variables be condensed into a construct of two dimensions - motivators (innovativeness, optimism) and inhibitors (insecurity, discomfort).

Since TR is fundamentally a personal concept, by including it in TRAM, the focal point is the end users. To comprehend the users’ psychological processes involved in the lengthy and challenging journey of technology adoption, TRAM can be applied to discover users’ differences before determining their user intention with the technology. Simply put, TRAM is a model that combines TR and TAM in the adoption of e-services that espouses the impact of TR on use intention is entirely mediated by both perceived ease of use (PEOU) and perceived usefulness (PU) as proven by the study by Lin et al. (2007).

Figure 1: A simplified version of the Technology Readiness and Acceptance Model (TRAM) posited by Lin et al. (2007, p. 646).



Studies on TRAM

As its theoretical framework, TRAM will be the foundation for the researchers' proposed research design. According to previous studies, the TR construct in TRAM is a concept that envisages how people feel about the practicality and efficiency of new technologies (Blut & Wang, 2020; Suwannakul, 2021; Wiese & Humbani, 2020). Lin et al. (2007), the founders of TRAM, treat TR as a high-order factor and investigate its impact on PEOU and PU, with some researchers maintaining that the connections between TR and TAM factors (i.e. PEOU and PU) are not clear (Huy et al., 2019; Jarrar et al., 2020; Lai & Lee, 2020; Mukerjee et al., 2019; Napitupulu et al., 2018; Sani et al., 2020).

It is essential to comprehend that there are both positive and negative variables of TR, that represent people's different attitudes toward cutting-edge innovation (Napitupulu et al., 2018; Yosser et al., 2020). Some researchers have claimed that TRAM should distinguish between positive and negative TR variables to explain their precise effects better (Blut & Wang, 2020a; Lai & Lee, 2020; Mukerjee et al., 2019; Sani et al., 2020). As TR may be split into positive and negative elements, it was proposed that TRAM be revised to reflect this development (Jarrar et al., 2020; Masudin, 2019; Suwannakul, 2021; Wiese & Humbani, 2020). Researchers have illustrated that positive and negative TR variables influence TAM cognition in ways that make it different. For instance, Jin (2013) indicates that Facebook users' opinions of the site's usability and usefulness were influenced favourably by, and negatively by TR.

Similarly, Kim and Chiu (2019) positive and negative TR variables significantly impacted PEOU and PU. The notion of the positive effect of TR was coupled with health consciousness (HC) in a study that used TRAM as a theoretical framework to predict a person's attitude to the intention to download and adopt applications for dietary and fitness activities (Chen & Lin, 2018). The findings convey that, supplementary to technology readiness, health consciousness positively affects the PEOU and PU of dietary and fitness apps.

A study further condensed the four variables of TR with the optimistic and innovative attributes that make up TR's positive component named as motivators and inhibitors, including insecurity and discomfort, making up the harmful component generated from the data of 193 independent samples taken from 163 articles that were reported by 69, 263 individuals (Blut & Wang, 2020). The study's findings recommend stronger relationships for classifying variables under motivators than for inhibitors. Motivating factors encompassing optimism and innovativeness are further supported by other studies (Jarrar et al., 2020; Masudin, 2019; Suwannakul, 2021; Wiese & Humbani, 2020). They are the forces that drive progress to TR. To be innovative means to be a trendsetter and an early adopter of new technologies (Parasuraman, 2000). According to Wiese and Humbani (2020) the article, people with a high level of natural acceptance of innovations (i.e., openness to new ideas) are more likely to examine new technologies and ultimately become innovators or early adopters. Optimism denotes the conviction that technology can enhance people's lives by giving them more power, freedom, and effectiveness (Mukerjee et al., 2019). Those with a more positive outlook on technology as a whole, also known as optimists, are more likely to take note of the positive features of individual technologies (in terms of convenience, for example) and are less apprehensive about the probable drawbacks (Napitupulu et al., 2018).

The effect of 'optimism' on users is identified through their impressions of the products' usefulness and how simple they find them to use; optimism is a meta-construct that sums up how some individuals feel about technology and demonstrates why it is beneficial (Qasem, 2021). Some scholars

argue that people's lives will advance faster than ever due to the development of information and communication tools, such as converging tools (Diamandis & Kotler, 2020). Optimists tend to obtain the most adaptable equipment, while pessimists are inclined to settle on the opposite. Optimists perceive technology as making their lives easier and perceive positive outcomes as unfavourable (Bajdor, 2021). Optimists are more inclined to be receptive to novel experiences and technology and less likely to settle on setbacks. Optimists are less likely to try to flee from their problems and more likely to embrace them (Blut & Wang, 2020a; Lai & Lee, 2020; Mukerjee et al., 2019; Sani et al., 2020). Optimists, hence, are most likely to use cutting-edge tools. As a result, they foster a more optimistic outlook and can even encourage people to transform their negative attitudes toward computers. Some researchers hypothesised that optimists have a more favourable impression of technology due to their alleviated worry about its potential drawbacks (Napitupulu et al., 2018).

Optimism affects perception towards ease of use of technology. Ease of usage is how much a user enjoys using a piece of technology (Iriani & Andjarwati, 2020). Two studies found that "usefulness had a significantly greater correlation with usage behaviour than the ease of use" (Davis, 1989, p. 319). Another study found that customers are less likely to be able to and want to utilise the technology if they find it challenging to comprehend and operate, as seen among the elderly (Guner & Acarturk, 2020). People more accepting of learning about new technologies have a greater probability of understanding how they function, which may lead them to think that it involves less effort to operate than it does in reality (Chen & Lin, 2018). The optimistic worldview makes its advocates more likely to invest time and energy in pursuing technology. As a result, more optimistic consumers have less perceived effort in using technology than people who are less hopeful and more pessimistic (Kim & Chiu, 2019). People who have a lot of anxiety have less faith in their abilities to utilise new technologies as they feel they do not have enough control over them. The reason is that an individual's perception of a technology's ease of use is significantly impacted by his or her sense of competence. (Chen & Lin, 2018)

The negative perspective of TR also includes the characteristics of discomfort and insecurity. They are the factors that work against a person's TR and reduce its degree. According to Jarrar et al. (2020), unease arises when one feels helpless given technological advancements. Since being uncomfortable makes one feel powerless, it must have a negative impact. High-anxiety individuals avoid using technology since doing so leads to stress and anxiety. Fear of technology is rooted in suspicions of its reliability and anxiety about its possible adverse effects (Mukerjee et al., 2019). It integrates a desire for reassurance with concerns about safety and fears of potential harm. If people are sceptical, they will see more risks than advantages in technological advancement and will likely shun it.

Feelings of helplessness and frustration while interacting with technological systems are what we mean when discussing discomfort (Kim & Chiu, 2019; Napitupulu et al., 2018; Yossier et al., 2020). Those who are not technologically savvy may assume that the public will not use specific tools because they make them feel powerless. This causes them to be cautious about utilising modern gadgets (Huy et al., 2019; Jarrar et al., 2020; Lai & Lee, 2020; Mukerjee et al., 2019; Sani et al., 2020). Many difficulties arise for those who are uneasy, such as a sense of helplessness in the face of technological advancements. These issues can be resolved by providing beneficial feedback and making technological adjustments. Those who are inherently uneasy tend to perceive technology as challenging (Suwannakul, 2021; Wiese & Humbani, 2020).

It is apparent that perceived usability and efficacy are affected by ‘insecurity.’ Distrust in technology and doubts about its efficacy denote insecurity (Jarrar et al., 2020; Lai & Lee, 2020; Mukerjee et al., 2019). Insecure people commonly have less faith in the dependability of modern technologies. They may be right to think that embracing cutting-edge innovation has its share of dangers. Prior studies have hypothesised that individuals’ risk evaluations affect their considerations of a product's utility and ease of use.

On the other hand, once individuals have faith, they will reap important advantages from adopting new technology and be ready to encounter the associated risks (Blut & Wang, 2020a; Lai & Lee, 2020; Sani et al., 2020; Suwannakul, 2021). Several studies have proven that personality traits under the TR construct influence the PEOU and PU of technology in forming the intention to adopt it. The notion of personality traits needs to be expanded to include the Big Five personality traits, which are significant yet underutilised in research studies.

Big Five Personality Traits

Many modern personality psychologists define ‘Big Five’ personality qualities, which they regard as capturing the essence of the various types of personalities. The Big Five construct is a taxonomy encompassing five higher-order personality traits which distinguish people and is considered the world’s most researched and used personality at present: with ‘big’ referring to broad personality traits (Kabigting Jr, 2021).

A study validated the five-factor model of personality (neuroticism, extraversion, openness to experience, agreeableness-antagonism, and conscientiousness-undirectedness) (also condensed into the acronym - OCEAN) advocating their adoption in personality research studies and assessment (McCrae & Costa, 1987). Extraversion, agreeableness, openness to experience, conscientiousness, and neuroticism are the ingredients of the Big Five personality traits, which are agreed upon by personality psychologists (Cherry, 2023). The trait approach to personality is a central theoretical area in the study of personality. It recommends that people have specific essential traits, and their personalities differ in strength and intensity (Cherry, 2024).

Openness

Individuals with a high score on ‘openness’ are likely to adopt innovations (Compernelle et al., 2018). It is a dimension with two extremes, with the opposing end being closedness (Costa & McCrae, 1992). Openness to experience is denoted as open-mindedness, curiosity, tolerance, interest in art and culture, creativity, and educational experiences (McCrae & Costa, 2008).

Conscientiousness

The conscientiousness dimension relates to one being organised and having the ability to control oneself and is positively associated with technostress, which refers to the perception of stressors related to the utilisation of information and communication technologies (Korzynski et al., 2021). Conscientiousness is a personality dimension that explains a person’s achievement level, work motivation, organisation and planning, self-control and acceptance of traditional norms, and virtue and responsibility to others (Costa & McCrae, 1992). For scholars, the opposing extreme of this direction is undirectedness. Regarding conscientiousness as a personality trait, individuals who exhibit high levels of this trait are inclined to be more comfortable with the PU and PEOU of green banking channels, as evidenced by a study (Wattjatrakul, 2016).

Extraversion

The personality attribute of extraversion exhibits itself in a person described as sociable, outgoing, chatty, forceful, and emotionally expressive (Bajwa et al., 2016). Those who score high on the extraversion scale lean towards being extroverted and re-energized by their engagement with others. Those who are low in this attribute are often known as introverted and innately more reserved. They are exhausted by social interactions as they need more energy to provide. Many introverts require time alone to ponder to 'recharge' themselves. The opposing party of the extraversion dimension is introversion (Costa & McCrae, 1992).

Agreeableness

Agreeable people are usually friendly, with the opposing people being antagonistic (Costa & McCrae, 1992). Agreeableness is principally an interpersonal behaviour dimension; it represents the interaction characteristic "along a continuum from compassion to antagonism" (Costa & McCrae, 1985, p. 2).

Neuroticism

This trait expresses feelings of sadness and psychological weakness, which have adverse effects (Costa & McCrae, 1985), while the opposite is emotional stability (Costa & McCrae, 1992). Neuroticism is an essential factor in most personality assessments and models, and it incorporates dimensions that comprise anxiety, hostility, depression, self-consciousness, impulsiveness, and vulnerability (Costa & McCrae, 1992).

TAM, TRAM, Personality Traits and E-Commerce

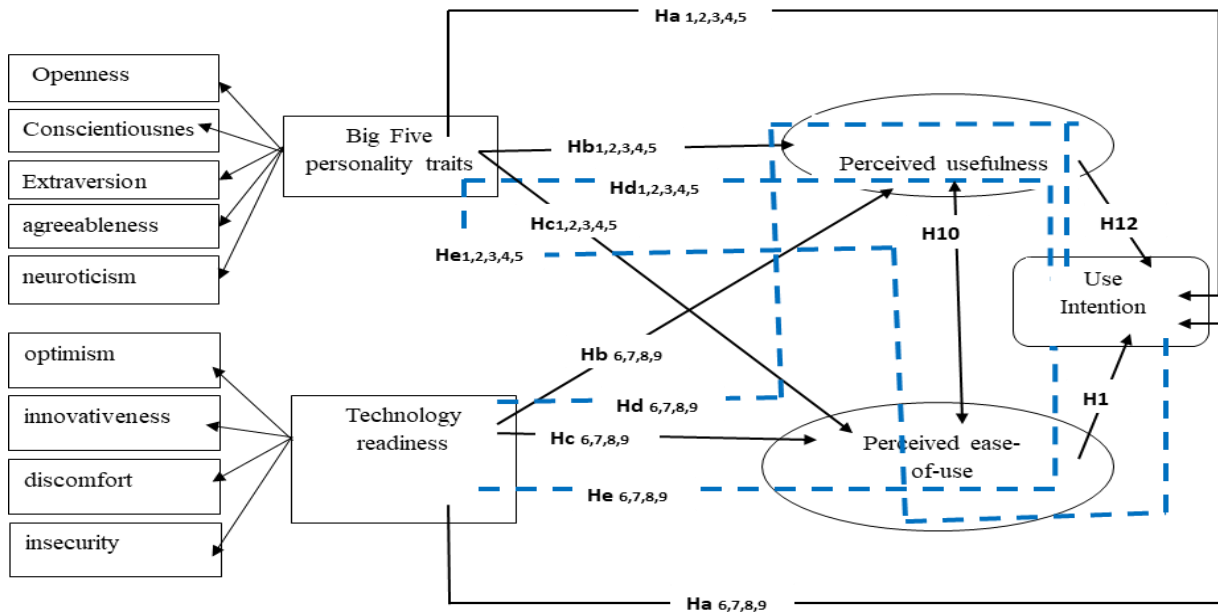
Various studies have indicated the link between personality traits through TR and technology acceptance (Denden et al., 2021; Malik & Singh, 2022). A study found that personality differences may impact individuals' acceptance of technology, which proved that "positive TR has a positive influence on PEOU and PU and hostile TR has a negative influence on PEOU and PU. PEOU and PU led to the intention to use sports wearable devices (Kim & Chiu, 2019). A study by Panday (2015) found that the optimism variable negates the notion of a significant impact on PU. Variables such as innovativeness and discomfort have a significantly positive effect on PU, while the variable insecurity has a significantly negative impact on the variable PU.

Prior research studies have combined personality traits (Big Five or Five Model personality theory) and TRI (Srivastava et al., 2021) or TAM (Joy & Venkatachalam, 2024; Kaushik & Agrawal, 2021; Khan et al., 2014; Özbek et al., 2014; Salar & Hamutoglu, 2022) but there appears to be only one recent study combining Big Five personality traits and TRAM specifically (Lixăndroiu et al., 2021). The sole study found that individuals with greater extraversion, openness, and agreeableness will exhibit higher technology acceptance (Lixăndroiu et al., 2021). The researchers suggest a mediating role of interpersonal innovation and extraversion in the relationship between functional value, value relations, and symbolic attitude.

More research is needed to fill the research gap on TRAM, the Big Five personality traits, and e-commerce. Thus, a conceptual framework must be produced (see Figure 2).

Conceptual Framework

Figure 2: Conceptual framework proposed



The conceptual framework proposed in Figure 2 illustrates the correlation between individual components of the Big Five personality traits and technology readiness, with PEOU and PU acting as mediators. PEOU and PU mediate the relationship between technology readiness and the Big Five personality traits' propensities and intentions to use the e-commerce platform.

CONCLUSION

In conclusion, intention to use e-commerce can be influenced by various factors, including personality traits, TR, PEOU, and PU. Personality traits such as openness, conscientiousness, extraversion, agreeableness, and neuroticism can shape an individual's inclination to embrace new technologies and their willingness to use e-commerce. TR, which encompasses optimism, innovativeness, discomfort, and insecurity, also plays a crucial role in e-commerce adoption.

Additionally, the PEOU and PU of e-commerce platforms influence consumers' intentions and actual usage. TRAM and Big Five personality traits provide theoretical foundations for better comprehending the relationship between personality and technology acceptance. These factors can help businesses and researchers better understand and predict consumers' intentions to use e-commerce, leading to more effective strategies and improved user experience in the digital marketplace.

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