Chapter 14
Examining the Underlying Attitudinal Components Driving Technology Adoption, Adaptation Behaviour and Outcome in Entirety

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14.1 Introduction

The ever-increasing use of and interaction with technology has intensified researchers' and practitioners' interest in technology adoption and adaptation behaviour (Muhammad et al. 2018). Use and adoption of technology has grown exponentially and has become an integral part of individuals' lives. The exponential growth of mobile telephony (Sharma 2017), cloud computing, 4G and 5G networks have created many more technological touchpoints. As a result, individuals are found to be connected to technology (smartphones, tablets, smartwatches, Cortana, Siri and Alexa) 24/7.

However, new technology creates various expected and unexpected outcomes in users' environment. They interpret and assess these outcomes in a number of ways by inducing different types of behavioural responses. Coping Model of User Adaptation (CMUA) describes that new technology or modification of the existing technology can bring about changes that are perceived as novel by users and cause disruption in their environment (Beaudry and Pinsonneault 2005; Louis and Sutton 1991; Lyytinen and Rose 2003). The acts that users perform to cope with such outcome of novelty and disruption etc. are called adaptation behaviour. Such adaptation behavioural responses range from restoring emotional stability to that of

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resisting or abandoning technology completely (Beaudry and Pinsonneault 2005). Similar stance was taken by Morris and Venkatesh (2010) and Venkatesh et al. (2010) that individuals' resistance to and acceptance of new technology or change in the existing technology has been a big challenge. Users perceive a number of changes in their environment around technology and experience many expected and/or unexpected outcomes of such technological disruptions. Based on such technological disruptions, individuals undertake different adaptation behaviours to cope with situations (Beaudry and Pinsonneault 2005; Fugate et al. 2008). Such situations or experiences, as described by Bala and Venkatesh (2016), result in negative consequences which may lead from underutilisation to complete abandoning of technology. Therefore, it is important to examine users' adoption and adaptation behavior in its entirety along with their outcome.

It is not known as what factors determine such adoption and adaptation behaviour and their outcome in its entirety especially in the current context of technology-related opportunities and users' privacy and security concerns. Researchers, academics and practitioners alike have not addressed this research gap as to how users react to technological changes and how their adoption and adaptation behaviour impacts on the consequences of such behaviour. Similarly, limited attention has been given to the interaction between antecedents of technology adoption and adaptation behaviour.

Although users' engagement with technology has received significant research attention (Al-Jabri et al. 2015; Charlesworth 2014; Hajli 2014; Hsu and Wu 2011; Akar and Topçu 2011; Hau and Kim 2010), there is paucity of research that identifies and analyses the factors that influence individuals' technological adoption, adaptation behaviour and outcome. Moreover, individuals' attitude was not given the due consideration in technology adoption. It is argued that technology adoption models need to re-introduce attitude into technology adoption models because attitude is the perceptions and dispositions held by individuals regarding the technology and the context (Dwivedi et al. 2017a, b).

Furthermore, we feel attitude is more relevant in this dynamic world of digitalisation and mobile applications, which have provided technology customers an entirely different world of technological innovation and technological devices (Agarwal et al. 2017). The advent of social media and the exponential growth in mobile telephony, cloud computing, 4G and 5G networks have created many more technological touchpoints (Sharma 2017). These ubiquitous technological touchpoints have enhanced connectivity and flexibility for customers (Chhonker et al. 2017) to adopt technology and be connected to technological devices 24/7. As a result, customers live virtually on these technological platforms using multiple devices such as tablets, smart phones including smart devices like Alexa, Siri and Google Home leaving their digital traces for marketers. Such digital footprints are not just identities but also memories, moments and behaviour. Social media providers that collect and crawl these digital footprints can determine how and why customers behave and purchase on digital platforms (Fish 2009). Therefore, technology adoption and adaptation behaviour help marketers analyse customers' sentiments and shared contents by using advanced analytics to gain deeper insight into their

behaviour and develop their profiles (Charlesworth 2014; Dwork and Mulligan 2013). Hence, further investigation is needed in this context to contribute to technological adoption and adaptation scholarship. This chapter addresses this research gap by reflecting on the existing literature and developing a theoretical understanding of the factors that determine individuals' adoption and adaptation behaviour and their outcomes.

Nonetheless, technology adoption and adaptation have been researched by previous studies. However, technology adoption has been researched more extensively (Davis et al. 1989; Hsu and Wu 2011; Lin and Anol 2008; Lu et al. 2009a, b; Venkatesh et al. 2003, 2012) than technology adaptation behaviour especially in the context of negotiating with new technological disruptions and users' perceptions of the consequences of such behaviour as to how they change their beliefs, attitude, knowledge and skills. Prior scholarly works focused mainly on adoption, antecedents and use of technology. They provided a landscape of theoretical frameworks on the adoption of technology (Hsu and Wu 2011; Lin and Anol 2008; Lu et al. 2009a, b; Venkatesh et al. 2012), for instance, Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), Decomposed Theory of Planned Behaviour (DTPB), Motivation Model (MM), Model of PC Utilisation (MPCU), Social Cognitive Theory (SCT), Innovation and Diffusion Theory (IDT) and the Unified Theory of Acceptance and Use of Technology (UTAUT and UTAUT2) are widely cited theories and frameworks for assessing individuals' adoption of technology.

TRA identified attitude and subjective norm as determinants of technology adoption. Attitude was identified as an individual's positive or negative feelings towards certain behaviour, subjective norm as an individual's perception of how others think an individual should use technology (Fishbein and Ajzen 1975). Similarly, TAM further developed the adoption of technology by identifying the functional attributes of perceived usefulness (enhance job performance), ease of use (free of effort) and subjective norms identical as in TRA (Davis 1989). TPB, on the other hand, added a new cognitive construct of perceived behaviour control (individual's self-evaluation of the inner capabilities and how easy or difficult one feels on the use of technology) to attitude and subjective norm constructs of TRA (Ajzen 1991). In addition to the above factors, MPCU identified constructs of job fit (enhance job performance), complexity (innovation difficult to use), affect (feeling of joy) towards acceptance and outcome that would pay off in the future (Thompson et al. 1991). Similar position was adopted by Davis et al. (1992), who theorised the Motivation Model and postulated extrinsic (valued outcome) and intrinsic motivations as an explanation of adoption behaviour. In addition, SCT proposed personal outcome expectation (self-esteem), anxiety (emotional reactions while using technology), self-efficacy (ability to accomplish certain task) and affect as liking certain behaviour (Compeau and Higgins 1995). Whereas IDT propounded relative advantage, ease of use, image, compatibility, voluntariness and result demonstrability. As a result, Venkatesh et al. (2003) unified the commonalities amongst the above eight models in their UTAUT model and combined the constructs having common themes into four constructs of performance expectancy, effort expectancy, social influence

and facilitating conditions as the key determinants of adoption of technology. They subsequently added more constructs in the form of habit, price and hedonic motivation in consumer context and proposed UTAUT2 (Venkatesh et al. 2012). Although UTAUT was initially developed to explain employees' adoption of technology in organisational contexts (Venkatesh et al. 2003), it was later extended into consumer technologies and finally into a Multi-Level Framework for cross-context theorising (Venkatesh et al. 2016).

The above theoretical landscape highlights the key antecedents of technological adoption but little focus is given to individual's adoption, adaptation behaviour and outcome of such behaviour in entirety. Adaptation behaviours are the acts that users undertake to cope with the perceived and emotional consequences/outcome of the technological event(s). Adaptation acts are performed by individuals in response to the change and disruptive event in their environment.

CMUA posits that an individual employs cognitive appraisal and adaptation behaviour when a user encounters a change in his/her environment or faces a stressful event (Beaudry and Pinsonneault 2005). Similarly, Bala and Venkatesh (2016) argue that individuals employ two processes when they face technological disruptions. First is the cognitive appraisal of the situation and second is the adaptation behaviour which represents the cognitive and behavioural efforts to cope with the technological disruption. Bala and Venkatesh base their arguments on the seminal literature of Beaudry and Pinsonneault (2005) that an individual copes with the change of technology through two sub-processes. Firstly, they evaluate the outcome of the event for personal relevance (primary appraisal). If it is positive and has benefits, they consider it as an opportunity or if it is negative and has harmful effects, they consider it as a threat based on personal well-being (Folkman et al. 1986; Major et al. 1998). In addition to the primary appraisal, individuals also evaluate the coping options (secondary appraisal) available to them. Coping options denote how much control or resources users have to deal with the event. Such interactions of both primary and secondary appraisals explain adaptation behaviour (Bala and Venkatesh 2016).

Adaptation behaviours are different actions (coping efforts) an individual performs to deal with the situation which is a combination of cognitive and behavioural efforts categorised as either problem focused (managing the disruptive event, dealing with the specific issue e.g. alleviating, altering the environmental issues, barriers and resources or changing oneself by developing new set of behaviours such as learning new skills or procedures and finding new channels of gratification) (Lazarus and Folkman 1984) or emotion focused (changing individual perception rather than the event e.g. regulating personal emotions and regulating personal distress or maintain a sense of stability minimising the consequences of threat; maintaining hope, positive comparison, passive acceptance, avoidance, denial and seeking emotional support). The specific combination of problem and emotions focused depends on individual's appraisal of the situation. They choose the particular coping strategy that has a major chance of success. Also, emotion focused mainly happens where an individual feels to have limited control on the situation while problem focused happens when one feels in control. Bala and Venkatesh (2016) argue that individuals

adapt problem focused and emotion focused coping strategies when they face technological disruptions make similar argument. The former is used when an individual directly engages with the situation to solve the problem at source, whereas the latter is used when they manage emotional distress. In addition, they suggest four technology adaption behaviours. First is about maximizing personal benefits by taking full advantage of the opportunities offered by a technology. Second is about benefit satisficing which means taking limited advantages offered by a technology. Third is about disturbance handling that denotes to minimising perceived negative consequences of technology and restoring personal emotional stability. Fourth is about self-preservation and restoring personal emotional stability with no impact on individuals' performance of a technology.

Hence, it can be argued that adoption literature has made strong contribution to IS scholarship over the years. Models such as TRA and TPB focused on users' attitude to determine users' adoption of technology (Ajzen 1991; Davis 1989; Davis et al. 1989; Fishbein and Ajzen 1975), whereas Venkatesh et al. (2003) argued that the impact of attitude on technology acceptance is spurious. In addition, TAM, UTAUT and UTAUT2 analyse technology adoption predictors at the micro and individual level, others such as IDT look into the diffusion of technology at the macro level. The other classic models such as TTF analyse technology use against specific task and job-related issues. Subsequent models and concepts emanating from these classic frameworks mostly deal with the factors that determine technology adoption. While some literature redefines some of the factors, others have introduced fresh new components to enrich and advance the understanding such as UTAUT2 model for consumer technologies by Venkatesh et al. (2012) and their subsequent Multi-Level Framework for cross-context theorising (Venkatesh et al. 2016). Nonetheless, these scholarly works predominantly based on quantitative modelling have been criticised by a different stream of literature that deals with a parallel notion. Over the years, the likes of Orlikowski, De Sanctis and Poole, and Beaudry and Pinsonneault have worked on how technology is further applied, extended and appropriated. It essentially raises questions on whether or not technology adoption literature should be confined only with technology adoption and determining factors. Simultaneously, a significant research stream within IS has developed in the last two decades that seeks to assess the impact of technology use. As such, adoption is not an end in itself and it needs to be studied as a component of the entirety of adoption, use, adaptation and outcome study. This study aims to develop a broader conceptual framework by examining the above propositions in the context of Coping Model of User Adaptation by examining the relationship between the antecedents (cognitive and affective) of adoption and adaptation behaviour and their outcomes.

The current theoretical models take into account factors that influence users' acceptance and use of technology but they do not fully capture the joint attitudinal components of cognitive and emotional influence on both technology adoption and adaptation behaviour. As Alwi and Kitchen (2014) suggest attitude is not only about cognitive but also affective evaluation of behavioural responses. As such, technology adoption is not an end in itself and it needs to be studied as a component of the

entirety that adoption, adaptation behaviour and their outcome when new technology or change in the existing technology is introduced. Therefore, the existing frameworks do not fully capture the dynamics and kinetics of technology adoption, adaptation and their outcome. In addition, they do not address the interaction between the adoption and adaptation behavioural antecedents as how such antecedents influence the outcomes of adaptation behaviour. They provide limited scope for generalisation.

In technology adoption literature, attitude has received most attention as psychologists have researched it for decades. It is defined as an overall judgement of an object (Fazio 1986) but Thurstone and Chave (1929) highlighted it as an evaluative or affective response to the attitude object. Zajonc and Markus (1982) defined attitude as two component structure of cognition and affect but the most popular definition of attitude in consumer psychology is proposed to consist of affective, cognition and connation (behaviour), the three responses to an object (Chiu 2002). Fishbein and Ajzen (1975) suggested that actions are controlled by intentions, which are determined by attitude towards behaviour that is personal positive or negative evaluation of the performing behaviour. Similarly, Chiu (2002) argues that affect-based components of attitude consist of emotions and feelings, whereas the cognition-based components include beliefs, judgements, or thoughts associated with an object. Attitude towards behaviour can be determined by salient beliefs and/or affect about the behaviour, each belief or affect links the behaviour with some valued outcome.

Moreover, the hierarchical causality of cognitive and affective aspects of attitude have been discussed immensely in the previous studies and their interaction had not been resolved (Lazarus 1982) such that several sequences are possible that emotions may precede cognition or vice a versa or they may have a dual process. Fishbein and Ajzen (1975) argued that affective components are based upon cognition. Similarly, previous studies concluded that emotional components germinate from cognitive elements (Da Silva and Syed Alwi 2008; Franzen and Bouwman 2001), which means that cognitive process precedes the emotional components, leading affective response. Whereas Zajonc (1980) propounded a strong counter argument that affect has primacy in the formation of certain preferences, that is, affect precedes cognition and at times functions autonomously.

Similar to this explanation, the determinants of technology adoption propounded by the previous models (TRA, TPB, TAM, UTAUT, UTAUT2 and Multi-level framework etc.) neither explicate the joint attitudinal components (cognitive and affective) leading to adoption and adaptation behaviour nor determine the hierarchical causality of cognitive and affective aspects of attitude. According to Alwi and Kitchen (2014) attitude is not only about cognitive but also affective and behavioural responses. Moreover, recently researchers (Dwivedi et al. 2017a) have not only re-introduced attitude into technology acceptance models but also highlighted the role attitude in technology acceptance and adoption (Dwivedi et al. 2017b; Rana et al. 2017, 2016). Dwivedi et al. (2017a) argue that it is important for technology acceptance and adoption models to reconsider the role of attitude in technology adoption. They posit, even though the four exogenous constructs of UTAUT are

based on technological (performance and effort expectancy) and contextual attributes (social influence and facilitating conditions), in effect they underline the individuals' perceptions of a technological application within a given context. The key element missing from UTAUT is the individual characteristics, user dispositions, such as attitude explaining the adoption behaviour. Nevertheless, adoption and adaptation of technology not only denote the cognitive or functional attitudinal attributes but also related to emotional, symbolic, affective and hedonic aspects such as fun, enjoyment and self-enhancement (Diffley et al. 2011; Park and Kim 2014). Henceforth, it can be argued that prior models have not paid enough attention to such attitudinal components with partial explanation of users' attitude and do not fully capture the impact of joint attitudinal components. Moreover, so far there has been little discussion around the negative attitudinal components around perceived threat, privacy and security risks and trust on technology adoption and adaptation behaviour. Such factors as this research aims to examine can influence users' adoption and adaptation behaviour of technology (Boyd 2008; Chew et al. 2008; Lee et al. 2013). It is, therefore, vital to consider both cognitive and affective attitudinal components for their joint impact on users' adoption and adaptation of technology and focus on the key outcome of such adaptation behaviour.

Looking at new technology attraction for users, it is based on both functional aspects related to tangible benefits such as usefulness, ease of use and convenience etc. whereas emotional aspects are manifest in their feelings of attitude towards technology (Chiang 2013; Hajli 2014; Zhang et al. 2014). Technology adoption and adaptation scholars such as Venkatesh, Bala, Beaudry and Pinsonneault have recognised the cognitive appraisal but did not touch on the emotional components. Hence, it can be argued that both cognitive and emotional attributes jointly determine adoption and adaptation behaviour and an individual assesses the outcome of technological disruption jointly rather than merely cognitive appraisal. The extant literature (Ajzen and Fishbein 1980; Al-Gahtani et al. 2007; Bhattacherjee 2001; Compeau and Higgins 1995; Davis et al. 1989; Lin and Anol 2008; Moore and Benbasat 1991; Muhammad et al. 2018; Plouffe et al. 2001; Thompson et al. 1991) suggested several determinants on technology adoption hinging around the key social, personal and technological factors but little on joint attitudinal components. Looking to this line of argument, prior models have indistinctively posited the key antecedents (attitudinal components). Therefore, they provide limited expositions of users' joint attitudinal components of adoption, adaptation behaviour and outcome. Even Venkatesh et al. (2016) in their revised multi-level framework acknowledge that UTAUT has reached its practical limitations and research. The revised framework was formulated based on a comprehensive literature review of UTAUT from 2003 to 2014 to understand the developments on the use and adoption of technology. They identified key limitations of technology acceptance and adoption of UTAUT with little focus on adaptation behaviour but with focus on technology feature outcome studies (Lu et al. 2009a, b; Venkatesh et al. 2008, 2012, 2016). Moreover, they posited that there was a lack of paradigm shifting research in technology adoption (Venkatesh et al. 2016).

This research is in concordance with the view that a paradigm shifting research is needed to study technology adoption, adaptation behaviour and outcome. The paradigm shifting research is vital because it is evident from the above discussion that users (consumers, citizens, employees), organisations, including contexts (online buying, posting, blogging etc.), and tasks (buying, sharing, filing tax return) all hinge on user's attitude towards adoption and adaptation behaviour of technology depending on the joint cognitive and emotional dispositions towards new technological disruption.

Therefore, in this chapter we aim to address this gap in the literature and develop a model of technology adoption and adaptation behaviour based on prior technology adoption models (UTAUT, TAM, TPB etc.) and CMUA to identify attitudinal antecedents and outcomes of such behaviours. It is to focus on the recursive interactions amongst technology adoption, adaptation behaviours of an individual and the outcomes of such behaviour (Bala and Venkatesh 2016; Nan 2011). It provides insight into two distinct adaptation behaviours. The first is about individuals' actions to appropriate technological features and adapt technological behaviour (explore and exploit technological benefits, explore to revert or avoid technology completely). The second is about recursive actions that include changes in contexts such as control mechanisms. Individuals undertake several adoption and post-adoption behaviour to embrace different adaptation strategies to cope with the new technology or change in an existing technology.

14.2 Conceptualising Adoption and Adaptation Behaviour

From the above scholarly works, several technology adoption factors determine users' acceptance and reluctance to adopt or adapt technology. There are not just cognitive but also affective (emotional) attitudinal components that influence their adoption and adaptation behaviour. Psychologists have discussed attitude for decades and it has received much attention in consumer behaviour research (Chiu 2002). Attitude is defined as a mental state of readiness exerting influence upon an individual's response to an object and contains cognitive, affective and behavioural responses to an object or stimuli. Cognitive is what an individual knows about an object, affective refers to feelings or emotions and conative is how the individual is likely to act on his/her knowledge and feelings (Chiu 2002; Breckler 1984; Edwards 1990).

To analyse a user's attitude towards technology and their fear of privacy and security and feeling of threat about technology adaptation behaviour, it is vital to throw some light on attitude in technology adoption and adaptation behaviour. Prior studies suggest that attitude is linked to an individual's intention, as intention is assumed to accurately capture the motives that determine actual behaviour (Armitage and Conner 2000; Gupta and Pirsch 2006). Furthermore, it is also argued that behaviour is well explained by intention, attitudes and normative beliefs, whereas

numerous studies have used cognitive and affective attitudinal components to determine individuals' attitude towards an object or entity (e.g., Armitage and Conner 2000; Gupta and Pirsch 2006; Lwin et al. 2002; Pike and Ryan 2004).

As such, attitude is formed on the basis of cognitive, affective and behavioural components with numerous conceptualisations of attitudes (Chiu 2002; Eagly and Chaiken 1993; Ford and Smith 1987; Lazarus 1982; Rosenberg and Hovland 1960). Eagly and Chaiken (1993) argue that a cognitive component exists when an individual processes information about the attitude object (technology), which forms into beliefs. Similarly, Ajzen and Fishbein (1980) highlighted that attitudes are formed of beliefs that get accumulated during an individuals' lifetime. Due to which an individual will perceive the outcome of his/her action either positive or negative based on his/her beliefs. It means if an individual has a positive belief about the outcome of behaviour, they will have a positive attitude about the behaviour and vice a versa. Kwon and Vogt (2010) suggest that affective attitudinal components are emotional experiences or preferences. Both positive (e.g. enjoyment) and negative (e.g. fear) emotional influences can arise from positive and negative experiences of the attitude object (technology) such that a positive emotional reaction to an experience are more likely to evaluate an attitude favourably (adopt technology) and vice a versa (Eagly and Chaiken 1993). Kwon and Vogt (2010) claim that attitude is composed of affective components such as delight, satisfaction and fear, whereas behavioural response is an action that an individual exhibits as a result of particular attitudinal attribute(s).

Reflecting upon the above academic debate around users' attitude towards an object (technology), Beaudry and Pinsonneault (2005) in their Coping Model of User Adaptation have ignored the affective (emotional) element in technological adaptation behaviour. They argue that an individual undertakes primary and secondary cognitive appraisals to cope with the consequence of a new technological event. Since this study aims to examine technology adoption and adaptation behaviour as a composite phenomenon, it is vital to examine the joint impact of cognition and affection on technology adoption and adaptation behaviour. Based on the review of the scholarly works and being parsimonious towards the antecedents of technology adoption and adaptation behaviour, this study convincingly proposes the joint cognitive and affective antecedents of adoption and adaptation behaviour with the details discussed later in this chapter.

Therefore, this study, unlike CMUA, posits that it is not only cognition but also affective components that influence technology adoption and adaptation behaviour and expound four cognitive antecedents (perceived opportunity, perceived relative advantage, perceived social influence and perceived control) as the cognitive utilitarian attitudinal components of technology adoption and adaptation behaviour and five affective attitudinal components (enjoyment, self-enhancement, threat, fear and trust) as affective (hedonic) attitudinal components of technology adoption and adaptation behaviour along with key outcomes. Each of these constructs is discussed below.

14.2.1 Adoption

14.2.1.1 Perceived Opportunity

Bala and Venkatesh (2016) define perceived opportunity as the degree to which an individual believes that new technology would offer them success such that they may perceive new technology as providing personal growth opportunities, reward, job performance. Hence, they develop a holistic assessment of the opportunity with the introduction of the new technology. Similarly, Venkatesh et al. (2003) suggested that when users adopt technology, they develop tend to believe that the use of new technology will enhance their job performance. Dutton and Jackson (1987) suggest that perceived opportunity is a positive situation in which users' gain is expected to happen. It can be argued that a user having adopted the technology, based on their cognitive appraisals, assesses the outcome of the use of new technology as how they would be personally and professionally affected. Such assessments determine an individual's adaptation behaviour and from such assessment they may infer that the new technology is less tedious and more fun. It offers more opportunities to learn new things and new skills. Hence, such assessment of the consequences or outcome of technology adoption is considered as perceived opportunity by an individual (Dutton and Jackson 1987). However, technology is multifaceted and can be assessed by individuals to have both positive and negative consequences. It depends on the relative importance of these consequences and based on such assessments adaptation behaviour will occur (Lazarus and Folkman 1984). In addition, Beaudry and Pinsonneault (2005) highlight that the adaptation behaviour of an individual starts as soon as they become aware of the consequences of the adoption of technology, they evaluate the new technological disruption in terms of personal and professional relevance and importance. Louis and Sutton (1991) argue that the individuals who have strong locus of control about the external stimuli would be able to have adaptation sooner. They identify individuals' locus of control as their personal belief that they would be able to control their destiny. In the context of technology adoption literature, the more technology provides control to individual users, the adoption of technology would abound and henceforth their adaptation behavioural efforts will occur. Coping literature and CMUA have their locus on a certain point that individuals develop their assessment of technology based on certain features of technology or functional characteristics that they perceive to be novel. Such assessment leads to their perceived compatibility of technology with their individual values and needs and expected task and technology fit which they perceive as an opportunity. When individuals believe strong task technology fit, they will perceive that as an opportunity to improve their performance and technology will be assessed positively (Karahanna et al. 1999; Venkatesh et al. 2003; Zigurs and Buckland 1998).

Agarwal and Prasad (1999) argue that individuals who have high personal innovativeness are likely to perceive technology more positively. Hence, it can be argued from the above discussion that individuals when face any technological disruption in their environment, they will develop the assessment of such technological

disruption based on the consequences. If they believe that new technology or change in the existing technology improves their tasks, improve their job or bring about a success in certain aspects of their lives, they would perceive such technological disruption as an opportunity.

14.2.1.2 Perceived Relative Advantage (PRA)

Perceived relative advantage, as a key measured construct, is defined and operationalised as follows. Relative advantage is used in previous studies in several dimensions; however, mainly with common themes. This research has taken a similar stance and operationalised PTI to embody the key constructs of performance and effort expectancy adopted by UTAUT (Venkatesh et al. 2003) along with the theme of relative advantage for technology users (Zolkepli and Kamarulzaman 2015). Hence, this research postulates that PRA includes usefulness, ease of use, technological innovation and convenience affecting cognitive utilitarian attitude. This exposition also complements the premise that UTAUT was formulated in 2003. Although it was revised in 2012 in the consumer context and multi-level framework in 2016, it does not fully capture the joint attitudinal components (cognitive and affective) and the rapid technological advancement, which has brought a paradigmatic shift in users' acceptance of technology worldwide.

Previous studies identified perceived utility, perceived usefulness, ease of use, and relative advantage as predictor of intention to use technology (Compeau and Higgins 1995; Davis et al. 1989; Moore and Benbasat 1991; Plouffe et al. 2001; Thompson et al. 1991). Venkatesh et al. (2003) incorporated these constructs under a unified construct of performance and effort expectancy. Similarly, this research incorporated them into one utility cognitive construct of PRA based on the similarities found in the previous studies (Chiang 2013; Gironda and Korgaonkar 2014; Wang et al. 2012; Zhang et al. 2014; Zolkepli and Kamarulzaman 2015). Relative advantage is defined as the degree to which technological innovation is perceived being better than its precursor, perceived usefulness to enhance job performance (instrumental in achieving valued outcome) and perceived ease of use is identified to be free of effort (e.g., Chen et al. 2009; Chiang 2013; Davis 1989; Garcia and Calantone 2002; Hsu et al. 2007; Jan and Contreras 2011; Kitchen and Panopoulos 2010; Lean et al. 2009; Lee et al. 2011; Lin 2011; Papies and Clement 2008; Rogers 2003; Vijayasarathy 2004). This research incorporates them into a utility cognitive construct of Perceived Relative Advantage and postulates that PRA unifies the aforementioned utility constructs.

14.2.1.3 Perceived Social Influence (PSI)

Social influence is defined as the degree to which an individual perceives that important others think he/she should use technology and subjective norms are a type of social influence by referent group (friend, family etc.) to influence behavioural

intention (Ajzen 1991; Chiasson and Lovato 2001; Dholakia et al. 2004; Fishbein and Ajzen 1975; Talukder and Quazi 2011; Venkatesh et al. 2003). Venkatesh et al. (2003) suggests that social factors, subjective norms and social image are related terms and combines them into social influence.

Similarly, this research posits that social influence is users' perceived social pressure (PSP) which are their cognitive psychological goals to develop and maintain social relations with others and enhance interpersonal utility (Ellison et al. 2007; Grieve et al. 2013; Whiting and Williams 2013). As a result users perceive social pressure to connect, collaborate and communicate with others on technology (Chang and Chuang 2011; De Valck et al. 2009; Hussain 2012; Trivedi et al. 2016). Hence, PSP is users' cognitive psychological pressure from external factors to interact, maintain social relations and enhance interpersonal utility of technology (Bharati et al. 2014; Chiasson and Lovato 2001; Grace et al. 2015; Talukder and Quazi 2011; Venkatesh et al. 2003). Such perceived social pressure drives social interaction; desire to connect, collaborate and communicate with others through technology (Chang and Chuang 2011; De Valck et al. 2009; Hussain 2012; Trivedi et al. 2016), establish social ties with others (friends, colleagues and family), social bonds, shared goals, increased social belonging to the community (Blanchard and Markus 2004; Hau and Kim 2010; Chiu et al. 2006; Chow and Chan 2008; Cohen and Prusak 2001; Ridings et al. 2002) and social support; a social aspect of exchange to help and share information with others on technology (Ali 2011; Crocker and Canevello 2008), willingness to help, fulfill social needs that result in warmth online relationship (Laurenceau et al. 1998; Liang et al. 2011; Maslow 1954; Zhang et al. 2014). Hence, this research postulates that PSP denotes users' perceived social pressure for social interaction, social ties and social support.

Social interaction is highlighted as the desire to communicate, interact with others and build relationship (Al-Jabri et al. 2015; Ko et al. 2005). It is human nature to socialize and interact with others (Dyson 1998). Technology is perceived by users to enhance social interaction, connect them anywhere and complement their offline relationship (Park et al. 2009; Papacharissi 2009; Rosen 2007). Users are led by psychological goals to develop social relations, increased social motivation, companionship and interpersonal utility with other technology users to gratify their socialisation needs (Amichai-Hamburger et al. 2002; Ellison et al. 2007; Cheek and Buss 1981; Grieve et al. 2013; Korgaonkar and Wolin 1999; Nie 2001; Oldmeadow et al. 2013; Palmgreen and Rayburn 1979; Papacharissi and Rubin 2000; Park et al. 2009; Whiting and Williams 2013). Hence, they feel pressured from others (peers, family etc.) to adopt technology (Grace et al. 2015). Users' behavioural intention is positively associated with social strengths and their behaviour can be determined by social influence that enhances their technology use and acceptance (Hsu and Wu 2011; Lin and Anol 2008; Lu et al. 2005; Venkatesh and Morris 2000; Wei et al. 2009).

Social support is an exchange of resources between a provider and a recipient with the intention to enhance the well-being of the recipient (Shumaker and Brownell 1984). Social support is more a personal and social aspects of exchange with the function to share information with the ones who are loved or cared for

within the communication network (Ali 2011; Cobb 1976). Social support is a major social value for technology users from the online community (Obst and Stafurik 2010; Shaw and Gant 2002). Social support is understanding and providing information (solution, advice and recommendation) to other technology users, that is, if social support is present, it is natural for technology users to share commercial information (Crocker and Canevello 2008; Taylor et al. 2004).

14.2.1.4 Perceived Control

This research proposes that if technology provides more control to users, they will have positive attitude towards technology. It also improves their trust in technology. As a result, it will reduce their feeling of threat and fear and enhance their trust (Cheung et al. 2015). Ridings et al. (2002) argue that if technology users are given more control, their trust in technology will enhance. Similarly, extant literature suggests that users' online transaction decisions depend on the level of control regarding information disclosure is given to users by technology which in turn builds their trust in the integrity and reliability of vendors and reduces the level of risk (Culnan 2000; Eastlick et al. 2006; Hadjikhani et al. 2008; Hoffman et al. 1999; Li et al. 2006; Morgan and Hunt 1994; Warrington et al. 2000; Wu et al. 2010). Tucker (2014) suggests that users react positively when web platforms give control to them. Similarly, perceived control on personal information can enhance trust among technology users. If they are able to control their information on technology, their trust on technology will improve and risk of privacy will reduce (Cheung et al. 2015; Krasnova et al. 2010).

14.2.1.5 Enjoyment

Venkatesh et al. (2003) unified facilitating conditions from perceived behaviour control and compatibility from Theory of Planned Behaviour (TPB), Technology Acceptance Model (TAM), Innovation Diffusion Theory (IDT) and Model of PC Utilisation (MPCU). This research posits that compatibility and facilitating conditions are cognitive utilitarian factors and therefore incorporated them into PTI but users' hedonic factors are operationalised as follows.

Enjoyment constitutes of users' intrinsic emotional factors driving their perceived intrinsic sensory pleasure (hedonic and emotional) (Park and Kim 2014) that satisfies their hedonic needs of enjoyment. Vroom (1964) highlighted that individuals' target behaviour can be determined based on certain hedonic benefits that satisfy their needs. Enjoyment is intrinsic motivation that encourages users to share information, participate in discussion and engage in a sensation (Lin et al. 2008; Nov et al. 2010). Hence, this research postulates that users are driven by their intrinsic sensory elements of joy and enjoyment, hedonic and emotional self-focused dimensions originated from self-interest that drives users' attitude (Hau and Kim 2010). Similarly, pleasure is identified as playfulness, fun and an

intrinsic acceptance of technology (Moon and Kim 2001; Sledgianowski and Kulviwat 2009; Van der Heijden 2004; Zolkepli and Kamarulzaman 2015). Furthermore, flow is highlighted as users' full immersion in an online activity leading to culmination of enjoyment (where nothing else seems to matter) and ensuing more online activity and significant effect on users' purchase intention (Domina et al. 2012; Huang 2012). It can be argued that flow enhances users' enjoyment driving their attitude toward technology. Hence, enjoyment is constituted of pleasure and flow, optimal psychological experience in online activity resulting in greater enjoyment, revisit of websites, prolong usage, purchase products and revisit technology (Csikszentmihalyi 1977; Cyr et al. 2005; Hsu and Wu 2011; Jackson and Marsh 1996; Kabadayi and Gupta 2005; Koufaris 2002; Lu et al. 2009a, b; Novak et al. 2000; Rettie 2001; Wu and Chang 2005). Thus, users' affective needs are intrinsic by nature, arousing from within, ensuing pleasant hedonic motivation of joy, fun and pleasure (Champoux 1996; Chiang 2013; Franke and Shah 2003; Füller et al. 2007; Hau and Kim 2010; Jeppesen and Molin 2003; Lerner and Tirole 2002; Porter et al. 2003). Similarly, Kim et al. (2011) argued enjoyment as intrinsic fun resulting in pleasure and satisfaction from a playful experience.

14.2.1.6 Self-Enhancement

Self-enhancement and self-esteem are the positive feelings about oneself for self-fulfillment (Hepper et al. 2011; Sedikides and Gregg 2008). High self-enhancers have high self-esteem due to which they overwhelmingly update and present their self-focused status online, share information regarding themselves and anything that they feel would enhance their self-status, image and attract attention from others (Hennig-Thurau et al. 2004). Self-status and self-esteem are the important factors that gratify technology users' self-fulfilling hedonic needs of self-esteem behaving and presenting themselves to portray the desired impression (Ali and Lee 2010; Sas et al. 2009; Terry et al. 2007). Similarly, self-presentation, which Boyd and Ellison (2007) argue, is the key element to motivate for technology adoption. Users reveal desirable information on technology to formulate the impression they wish to produce on others (Krasnova et al. 2010) and they also apply positive self-presentation strategies to reveal information for their subject well-being (Kim and Lee 2011). This research posits that self-esteem and self-enhancement enhance self-presentation and self-image expression on technology.

14.2.1.7 Affective Hedonic Attitude

Attitude is composed of affective components such as enjoyment and self-enhancement, whereas behavioural component has been highlighted as the actions that an individual exhibits in relation to the attitude object (Kwon and Vogt 2010).

Similarly, this research proposes that affective attitudinal components are users' positive emotions (e.g. enjoyment, flow) which arise from positive technology experiences. As a result such positive emotional reactions turn users' attitude more favourable to technology. It posits that technology adoption and adaptation behaviour is not only determined by cognitive attitudinal attributes but also more emotional and hedonic technology attributes such as fun, enjoyment, self-enhancement and self-presentation (Diffley et al. 2011; Park and Kim 2014). As Chiu (2002) confirmed that affect-based component of attitude consists of emotions and feelings. This research has a similar stance and therefore postulates that users' affective attitudinal components are emotional positive feelings of enjoyment, flow and self-enhancement which arise from positive experiences of technology such that their positive emotional reactions influence attitude positively. As such, it can be argued that enjoyment and self-enhancement are the affective attitudinal components which determine users' affective hedonic attitude.

14.2.1.8 Threat

Liang and Xue (2009) highlight that individuals make emotional appraisal when coping with technological threats. They define technological threat as when they feel that they are susceptible to malicious technology and the consequences of such technological disruptions are severe, they will feel threatened by technology. Similar argument is echoed by Bala and Venkatesh (2016) that the degree to which individuals believe that technological disruption and new technology brings about harm to their well-being, success or growth, they will perceive it as a threat. Some will feel technology will have an impact on their performance, it will downgrade or belittle their status and reputation in the organisation and amongst friends and they consider the technology as a threat (Beaudry and Pinsonneault 2005). Extant literature for example Liang and Xue (2009); Lapointe and Rivard (2005) posit that individuals develop an overall feeling of threat from the new technology. This leads individuals to feel that new technology has a negative impact on different aspects of their lives which they feel as a threat. They further suggest that individuals resist and avoid technology when they feel it as a threat and they consider that threat is a key antecedent to avoidance of technology.

According to Bala and Venkatesh (2016) individuals develop overall feeling about technology when they develop anxiety about specific situation. In the context of feeling about new technology, such anxiety can have negative influence on technological adaptation behaviour. Also, such assessment leads to their perceived incompatibility of technology with the values, needs and past experiences and task and technology misfit which could be felt as a threat by individuals (Dishaw and Strong 1999; Venkatesh et al. 2003; Zigurs and Buckland 1998). Hence, it can be argued from the above discussion that individuals when face any technological disruption in their environment, they will feel threatened of such technological event.

14.2.1.9 Fear

Privacy is the right to be left alone, the ability to control and select to divulge personal information (Eastlick et al. 2006; Ha and Stoel 2009; Warren and Brandeis 1890). It is defined as the individual's sense of fear on the consequences of disclosure of personal information, that is, the fear of identity theft, cyber harassment, and personal record for scrutiny by the public, the disruption when personal information goes viral. It is the fear of users that has negative relationship with the sharing of personal information online (Boyd 2008; Chew et al. 2008; Featherman and Pavlou 2003; Gross and Acquisti 2005; Im et al. 2008; Krasnova et al. 2010; Lee et al. 2013; Pavlou et al. 2007; Phelps et al. 2000; Rosenblum 2007). Akar and Topçu (2011) in their study on consumers' acceptance of technology found that users' fear had a huge impact on the use of technology. Furthermore, Ghosh et al. (2014) claimed that users' sense of fear impacts purchase intention and credibility which influence their decision making on the use of technology. Consumer behaviour in the virtual world is affected by consumers' fear of privacy and security (Cheung et al. 2015).

This research focuses on users' fear of privacy and security on technology adoption and adaptation behaviour. By adopting technology, individuals create public profile, connect and share information. These revelations and adoption of technology lead to fear of privacy and security (Cheung et al. 2015; Krasnova et al. 2010). It is the fear of the threat from the disclosure of information, abuse or unauthorised access to their personal information. Hence, the adoption of technology causes fear and anxiety amongst individuals (Karyda et al. 2009; Lanier and Saini 2008).

14.2.1.10 Trust

In addition to fear and threat of technology, trust is found to affect users' adoption and adaptation behaviour. It is users' sense of uncertainty over technology or confidence in the features of technology to provide them protection or improved their performance (Cheung et al. 2015; Cheung and Lee 2006; Gefen et al. 2003; Krasnova et al. 2010; McKnight et al. 2002; Metzger 2004).

In addition to fear, trust is found to affect users' adoption and adaptation behaviour. It is users' feeling of uncertainty over the ability of technology to provide them protection and confidence as users pay considerable heed to the features of technology and the integrity and reliability of such technological features (Cheung et al. 2015; Cheung and Lee 2006; Gefen et al. 2003; Krasnova et al. 2010; McKnight et al. 2002; Metzger 2004).

Users' attitude towards technology depends on the feeling of trust users have with the technology (Szmigin 2018). It refers to how confident they feel on the reliability of technology. Feeling of trust depends on technology's ability and reliability in handling users' expectations (Moorman et al. 1993). The feeling of trust is found

to have a key relevance to users' feeling of fear. Higher protection and confidence in technology may enhance users' feeling of trust in technology (Cheung et al. 2015). It can be argued that users' feeling of trust in technology play a significant role in users' fear of the outcome of technology adoption. Gamboa and Gonçalves (2014) suggest that trust enhances user loyalty. Equally, Pentina et al. (2013) found that consumers' trust in technology influences their intention to continue using technology. Trust is suggested to have a key relevance to users' fear and threat. It can be argued that the lack of reliability of technology will make the users more reluctant to adoption. Hence, if users' trust in technology is low, they would resist or abandon technology completely.

14.2.2 Adaptation Behaviour

Coping are those adaptation acts which individuals perform when they encounter a stressful event in their environment. The introductions of new technology or changes in the existing technology are major concerns for technology users (Beaudry and Pinsonneault 2005).

14.2.2.1 Exploration to Maximise Technology Benefits

Bala and Venkatesh (2016) highlighted maximizing personal benefits as the first adaptation behaviour which takes full advantage of the opportunities offered by a technology. Lazarus and Folkman (1984) describe that when individuals appraise the consequence of technological disruption as an opportunity, they take full advantage of the technology and tend to maximise personal benefits. Similarly, Boudreau and Robey (2005) argue that individuals are likely to maximise their efforts to technology and explore new technological features which improves their work and provide them opportunities to accomplish their job in innovative and creative ways. The same argument was propounded by Thatcher et al. (2011) that exploration of feature exploration of technology is tantamount to maximising innovative ways to use technology and maximise benefits of such technological features. Likewise, Bala and Venkatesh (2016) suggest that individuals who explore new technological features cognitively engage with benefit maximising strategy to take optimum advantage. Furthermore, it is argued that if individuals perceive new technology as an opportunity for instance improve their performance, brings success or growth in their job, they will both maximise the use of technology and take full advantage of technological features (Lapointe and Rivard 2005). Hence, one set of adaptation behaviour relates to optimizing the benefits of the technology by exploring various means of its use.

14.2.2.2 Exploitation to Satisfice Technology Benefits

Individuals in a certain situation where they perceive the outcome of new technology as an opportunity by making positive appraisal (both cognitive and emotional) of technological features, they will exploit technology benefits. However, if they perceive that they have limited control on technological features, they will have minimal adaptation acts (Beaudry and Pinsonneault 2005), which means their adaptation efforts will reduce. It is due to individuals' beliefs that the lack of perceived control on new technology limits their exploitation of technological features as they believe that they cannot avail the technological benefits (Folkman and Moskowitz 2000). Due to which individuals will explore to satisfy the limited benefits technology offers. Similarly, Bala and Venkatesh (2016) identify exploitation to satisfice technological benefits as routine and regular use to accomplish certain tasks. In other words they are known habitual features. It would mean they would not be able to exploit additional benefits because of the lack of perceived control on those technological features and individuals' inability to go beyond such technological features. Hence, in such a situation individuals will satisfice themselves with the limited benefits that a certain technology offers. Zuboff (1988) described that minimal adaptation was carried out when the new control system introduced in an organisation provided interesting opportunities to enhance employees' job performance but provided limited autonomy to employees to change their work and technological features. In addition, Bala and Venkatesh (2016) and Beaudry and Pinsonneault (2005) highlight that benefits satisficing is both problem and emotion focused strategy due to which individuals would be willing to exploit technological features. However, they will not be able exploit additional technological benefits because of their inability to go beyond technological features they learnt to exploit.

14.2.2.3 Exploration to Revert

Individuals perform different coping strategies when they assess the consequence of dealing with the technological disruption as a threat. Lazarus and Folkman (1984) describe such strategies are problem or emotion focused. Problem focused strategies are the combination of cognitive and behavioural efforts that is managing a disruptive event by alleviating and/or altering the environmental issues by developing new set of behaviour. It means they focus on managing the external event. In emotion focused strategies they change their individual perception by regulating personal emotions, personal distress to bring a sense of stability and minimise the consequences of threat. The combination of problem and emotion focused dimensions depend on individuals' appraisal of the event and the feelings that they have some control on the situation. If the threat is appraised as problem focused whereby they assess that threat can be managed well by managing the external event, they would adopt problem focused coping strategies. Similarly, if the threat is appraised more as an emotion focused, they will focus on minimising the inner emotional anxiety and distress. Similar argument is posited by Beaudry and Pinsonneault

(2005) that when individuals assess a situation as a threat they rely on both problem focused adaptation efforts (managing the situation by reverting it) and emotion focused adaptation efforts (minimizing the inner emotional distress and restore emotional stability) and it also depends on the individual perceived controllability of the situation. Hence, they may minimise the negative outcome of the event and restore emotional stability. Also, adaptation efforts get orientated to oneself, technology and task they perform. Majchrzak et al. (2000) argue that when an individual's adaptation efforts are orientated to oneself, s/he would likely seek more training. If it gets orientated to technology, individuals would look to revert technological features and make the efforts to minimise the negative features of technology. Likewise, if it gets orientated to task, they may change work procedures so as to better fit with the technology. Similar stance is expounded by CMUA that when individuals appraise the consequences of new technological features as a threat, they restore emotional stability and minimise the negative outcome of new technology. As a result they engage in exploration to revert adaptation behaviour by searching old ways of performing tasks. Also, Bala and Venkatesh (2016) posit that when individuals perceive that new technology is harmful for their well-being or may hinder their growth or damage their reputation, they explore ways to minimise the harmful consequences of such technological event.

14.2.2.4 Avoidance of Technology

Beaudry and Pinsonneault (2005) describe that when individuals assess a situation as a threat and they have limited control on the situation, they tend to opt to avoid technology altogether. It is because individuals' adaptation efforts will be mainly emotion focused. They would want to come out of the distress and their main focus would be restoring emotional stability (Folkman 1992; Lazarus and Folkman 1984). Individuals would also have strong intention to avoid technology if they find that there is high task and technology misfit. In addition, where individuals perceive that new technology would deskill or eliminate their job, they would completely avoid technology (Patrickson 1986). Bala and Venkatesh (2016) conceptualise the avoidance of technology as emotion focused adaptation because they posit individuals would eliminate psychological distress completely by avoiding technology when they assess technology as a threat and having no control on technology causing distress. Therefore, individuals would resort to self-preservation strategy and reducing distress caused by the technology. Similarly, the same argument is reflected in the CMUA theory and some qualitative IS literature (Dey et al. 2013; Carroll et al. 2003) that individuals will completely abandon technology if they perceive that new technology may cause tension and is characterised to be unhelpful. Unlike exploration to revert adaptation behaviour, where individuals assess the technological event (both problem and emotion focused) by changing the event (seek more training, change technological features or change work procedures), in this case they would resort to self-preservation strategy and complete avoidance of technology to restore emotional stability (Liang and Xue 2009).

14.2.2.5 Adaptation Behaviour and Outcome

Extant literature e.g. (Beaudry and Pinsonneault 2005; Kessler 1998; Lazarus and Folkman 1984) highlight that situational outcome of adaptation behaviour is determined by both primary and secondary cognitive appraisals. Bala and Venkatesh (2016) identified two adaptation behavioural outcome for employees; job performance and job satisfaction. They argue that following a technology implementation in an organisation, employees' exploration to maximize technological innovation or technological benefits will have a positive influence on their job performance and their job satisfaction. However, they also suggest that new technology brings about a change in employees' work processes. If employees perceive those changes as a threat and explore to revert or use old ways of doing their work, these employees will not be effective and efficient in doing their job. The implementation of new technology will make their job less efficient and decrease their job performance. Such adaptation to revert behaviour may develop negative reactions towards their work and may find their job demotivating and a feeling that new technology has neither enriched nor transformed their job. Hence, employees feel threatened from the work environment resulting in frustration and demotivation (Bala and Venkatesh 2016).

14.3 Summary

This chapter highlights some of the key issues around technology acceptance, adoption and adaptation and the role of attitude. In so doing it identifies and responds to the research gap and discusses the key underlying antecedents and discrete adaptation behavioural outcomes for technology adoption, adaptation and appropriation. Moreover, this chapter also sheds light on the joint attitudinal cognitive (perceived opportunity, perceived relative advantage, perceived social influence, perceived control) and affective (enjoyment, self-enhancement, threat, fear and trust) components, which are the key antecedents to adoption and adaptation behaviour. As such the chapter contributes to the advancement of the scholarship of technology adoption, adaptation and appropriation and offers theoretical impetus for further empirical investigation.

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