

Understanding Technology Adoption within the Service-Dominant Logic Paradigm

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Abstract

Purpose

Information and communication technologies (ICT) have revolutionised the marketplace though gaps exist in relation to marketers' ability to understand the distinctive behavioural processes behind consumers' adoption of technology-based services. Traditional consumer behaviour models focus on the "goods-centered" dominant logic (Sheth and Sisodia, 2006). A more appropriate model for understanding today's consumer is one which takes a service-dominant view where the consumer is a co-creator (Lusch *et al.*, 2007).

Design/methodology/approach

This research suggests a new model for understanding consumers' technology acceptance of technology-based services. It integrates Parasuraman's (2000) taxonomy of technology readiness (TRI) and a modified Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh *et al.*, 2003) by hypothesising that TRI's personality traits are antecedents to technology acceptance. This study will measure the relationship between the dimensions of the TRI and levels of UTAUT while taking into account moderating variables such as age.

Findings

Based on the research to date, hypotheses have been developed which will be verified with the support of a major mobile phone network operator by measuring technology readiness aligned to acceptance and use during longitudinal research of technology-based service beta-trials with actual consumers.

Originality/value

This research will provide a deeper insight into the behavioral processes behind consumers' adoption of technology-based services and will enhance marketers' knowledge about their consumers' readiness to interact with new technology based services.

Keywords: Service-dominant logic, technology acceptance models, technology readiness

Paper Category: Conceptual paper

Introduction

This paper describes a research programme which aims to support the concept of the service-dominant logic paradigm, by providing marketers with in-depth knowledge of consumer's propensity to adopt technology-based services coupled with usage intention.

The development of Information and Communication Technologies (ICTs) including the internet (Galletta et al., 2004; Vijayasarathy, 2004), mobile communications (Doolin et al., 2008; Nysveen et al., 2005a; Vrechopoulos et al., 2003), self service kiosks (Lin and Hsieh, 2007; Matthing et al., 2006; Meuter et al., 2003), RFID (Radio Frequency Identification) (Ferguson, 2002), pervasive communication services (Doolin et al., 2008; Venkatesh et al., 2007) and biometrics (Shugan, 2004), have revolutionised the marketplace. ICTs have significantly altered the service landscape with companies increasingly using technology within their service offerings. It should be noted that the term *service* in this paper refers to the application of competences, such as knowledge and skills, for the benefit of another entity or party, where value is generated in-use and in co-creation, which is a core concept within the service-dominant logic paradigm. Within this paradigm, the concept of goods still exists, but goods are seen as a means for conveyance of a particular service (Vargo and Lusch, 2006). For example a mobile phone can be considered to be a *good* which facilitates a communication *service* such as text messaging or mobile internet.

Advances in technology developments can improve service offerings, increase service efficiency, and provide functional benefits for customers (Lin and Hsieh, 2007; Matthing et al., 2006; Meuter et al., 2003). ICTs can enable consumers to enjoy the services they require with a more flexible choice of time and space (Meuter et al., 2003) which should provide a higher degree of satisfaction (Bitner et al., 2000). However, there is also growing evidence of increasing customer frustration when dealing with technology-based systems, with some consumers becoming more alienated due to increasing complexity when using these systems (Parasuraman, 2000). When customers engage with technology, different psychological reactions will occur, depending on the individual's feeling towards the technology-based system (Meuter et al., 2003). Technologies can evoke feelings of anxiety (Meuter et al., 2003; Venkatesh et al., 2003), as well as feelings of fun (Agarwal and Karahanna, 2000), that affect customers' beliefs about, and behaviour towards, technologies.

Many consumer technologies relate to the provision of services. Lusch et al. (2007) suggest that marketing academics and practitioners do not possess a full and adequate understanding of the concept of "service" and its role in exchange between consumers and companies. The proliferation of technology-based services, and evidence of the challenges and frustrations associated with using them effectively, suggest an urgent need for scholarly inquiry on how ready consumers are to embrace and use these technologies. However, there has been a lack of focus on researching the behavioural antecedents that drive today's consumer towards accepting technology-based services (Venkatesh et al., 2007; Venkatesh et al., 2003; Parasuraman and Colby, 2001) which has resulted in void in marketers' ability to understand and predict the behaviour of today's consumer (Lin and Hsieh, 2007; Nysveen et al., 2005a; Meuter et al., 2003; Parasuraman, 2000).

This research gap suggests a need for a model which will allow marketing practitioners and academics to gain an in-depth understanding, not only of reasons for technology acceptance or rejection, but to do this on an individual basis.

Vargo and Lusch (2004) anticipate that the service-dominant logic paradigm will create a substantial shift in marketing thought and will have the potential to replace the traditional

goods-centred paradigm. This approach involves collaborating with, and learning from, customers and being responsive to their individual needs. Vargo and Lusch (2008) posit that *service* is the fundamental basis of exchange and that the service mindset should be the lens through which researchers and practitioners view social and economic exchange. Since the majority of business practice and academic research has focused on goods-dominant logic, there is a need for research which considers service-dominant logic. This research meets this requirement by providing a model which will allow marketing practitioners to gain deeper understanding of their customers, thereby facilitating the development of stakeholder (provider and consumer) relationships.

One of the foundational premises (FP) of service-dominant logic is that value is always uniquely and phenomenologically determined by the beneficiary (Vargo and Lusch, 2008) and this can be linked to the constructs and hypotheses upon which this research is founded, for example, the perceived *value* of a service can be associated with the concept of *performance expectancy* (Venkatesh et al., 2003) which has the behavioural concept of perceived usefulness (Venkatesh et al., 2003; Davis, 1989) as its origin. This research focuses on understanding the adoption behaviour of technology-based services, where service value is created or co-created through usage. Understanding the service user as a consumer and co-creator requires new thinking and research into consumers' adoption and usage behaviour.

The paper begins with a review of the key literature pertaining to the service-dominant logic paradigm, followed by the current models of technology usage and acceptance. A model is then suggested which provides a classification of consumers' general propensity to adopt technologies coupled with constructs which provide an understanding of their service-specific acceptance and intended usage. Developing a dataset which documents consumers' general technology readiness and combining this with specific service adoption and usage behaviour, based on a selected set of mobile phone services, will provide the empirical evidence required to validate the hypotheses described within this paper. This addresses the void in marketers' knowledge about individual consumer psychographics, and the influence of these on technology adoption. Additionally, it provides a means for marketers to understand the levels of complexity that consumer segments, such as innovators and sceptics, perceive in relation to service offerings, thereby having the potential to influence feature sets provided with individual services depending on the target market segment. Following the description of the proposed model and hypotheses, a research methodology and project is described, which will provide sufficient empirical data to analyse and validate the proposed hypotheses. Finally, the paper presents the next stages of the research, and the contributions of this research to both academic theory and practice.

Literature review

The move towards a service-dominant logic

Marketers need to gain an increased understanding of consumers' perception and use of technology-based services (McCarthy et al., 2006; Shugan, 2004; Meuter et al., 2003). A customer's reluctance to adopt a new ICT can be an obstacle for companies that want to provide technology-based services (Liljandera et al., 2006) and therefore it is crucial for marketers to improve their knowledge of factors affecting a consumer's willingness to adopt a new ICT (Walker et al., 2002).

Sheth and Sisodia (2006) argue that companies striving for success in the future need an 'intimate' understanding of their customers and comprehensive knowledge of how these

consumers interact with new technology. Gummesson (2008) supports this notion by positing that suppliers and consumers can no longer be separated, and that the concept of balanced centrality needs to be considered, whereby all stakeholders have the “right to satisfaction of needs and wants” (Gummesson, 2008:17). Shah et al., (2006; 115) support this contention suggesting that true customer centrality is in “creating value for the customer and in the process, creating value for the firm; in other words, customer centrality is concerned with the process of dual-value creation”.

Hunt and Madhavaram (2006) posit that marketing should shift towards the customer-centric, market-driven, services-centered view, and should seek to maximise customers' involvement in developing customised offerings by adapting to their individual needs. Woodruff and Flint (2006) build on this notion by stating that implementing S-D logic depends critically on understanding customer’s perceived value of a service. Vargo and Lusch, (2008:8) note that the S-D logic is “a service-centered view (which) is inherently customer oriented and relational”.

Service-dominant logic represents a departure from the traditional goods-dominant (G-D) logic of exchange. A key differentiator between goods-dominant and service-dominant logic is that the G-D concept of producers offering goods as the focus of exchange is replaced with the concept of producers providing a service to consumers, and that goods can be used as a medium to support this service offer (Vargo and Lusch, 2006). Other differentiating factors are listed in Figure 1.

Goods Dominant Logic	Service-Dominant Logic
Goods	Service(s)
Tangible	Intangible
Operand Resources	Operant Resources
Asymmetric Information	Symmetric Information
Propaganda	Conversation
Value Added	Value Proposition
Transactional	Relational
Profit Maximization	Financial Feedback

Figure 1: Contrasting G-D and S-D Logics (Lusch and Vargo, 2008:90)

According to Vargo and Lusch (2008) the theory of service-dominant logic focuses on a number of foundational premises, which define a needed shift in marketing thought, as summarised below.

Service is the fundamental basis of exchange; Indirect exchange masks the fundamental basis of exchange; Goods are a distribution mechanism for service provision; Operant resources (e.g. knowledge) are the fundamental source of competitive advantage; All economies are service economies; The customer is always a co-creator of value; The

enterprise cannot deliver value, but only make value propositions; All social and economic actors are resource integrators; Value is always uniquely and phenomenologically determined by the beneficiary.

It is clear that increasing knowledge about consumers, their usage and perceptions of a service, and appreciating the value a consumer places on a service are critical elements in an organisation's move towards a service-dominant logic marketing approach.

To date when studying consumer behaviour, traditional models have focused on the goods-centered dominant logic and the transaction perspective inherent in hierarchical models (Sheth and Sisodia, 2006). Many behavioural scientists have questioned the adequacy of such models since they portray the process of proceeding through the decision-making process as linear and as taking a logical problem solving approach (Foxall, 2002; Erasmus et al., 2001). Moreover, the dominant models in consumer behaviour, such as the Engel et al. model (1968) or Howard's consumer decision-model (1960), tacitly assume that products arrive in the marketplace with their benefits, meaning, and uses fully pre-determined (Chunyan et al., 2008). There is a limited understanding of the behavioural antecedents that drive the consumer towards accepting new products or services (Matthing et al., 2006; Von Hippel and Katz, 2002; Rust and Lemon, 2001) or of the reasons why and how consumers act creatively during the decision-making process (Burroughs and Glen Mick, 2004). As a result, much research in marketing has been preoccupied with decision-making, focused on consumers acting as passive buyers of what others produce rather than treating consumers as "active value creators" (Chunyan et al., 2008: 109).

In particular, current research highlights the importance of gaining a more comprehensive understanding of the drivers or antecedents behind acceptance and adoption of emerging ICTs (Venkatesh et al., 2007) and to use this knowledge as a means to "strengthening positive technology readiness drivers and reducing technology readiness inhibitors in order to raise technology readiness of customers as a whole" thereby increasing satisfaction and behavioural intention (Lin and Hsieh, 2007: 1608). Meuter et al. (2003) posit that it is critical for researchers to understand customer usage and perceptions of technologies, from an attitudinal, behavioural and psychographic viewpoint. Venkatesh et al. (2007:286) argue that a deeper understanding of the dynamic behavioural influences is needed and future research should focus on identifying constructs that can add to "the prediction of intention and behaviour *over and above* what is already known and understood". This research aims to address these issues by enhancing a model of technology adoption and usage, by integrating it with a model which details psychographic factors related to technology readiness.

The following section provides an overview of the extant literature related to consumer's acceptance and usage of technology, and consumers' psychographic traits related to this adoption and usage activity, with a view to demonstrating its applicability in relation to technology-based services within the scope of the service-dominant logic paradigm.

Modelling technology acceptance and adoption

Numerous studies have examined technology acceptance and adoption since this area of research emerged during the 1970s, with researchers building on the results of others, and culminating in the development of the Unified Theory of Acceptance and Usage of technology (UTAUT). Combining the insights from the literature, the diagram below outlines the evolution of the key models used to analyse users' acceptance of, or intention to use technology.

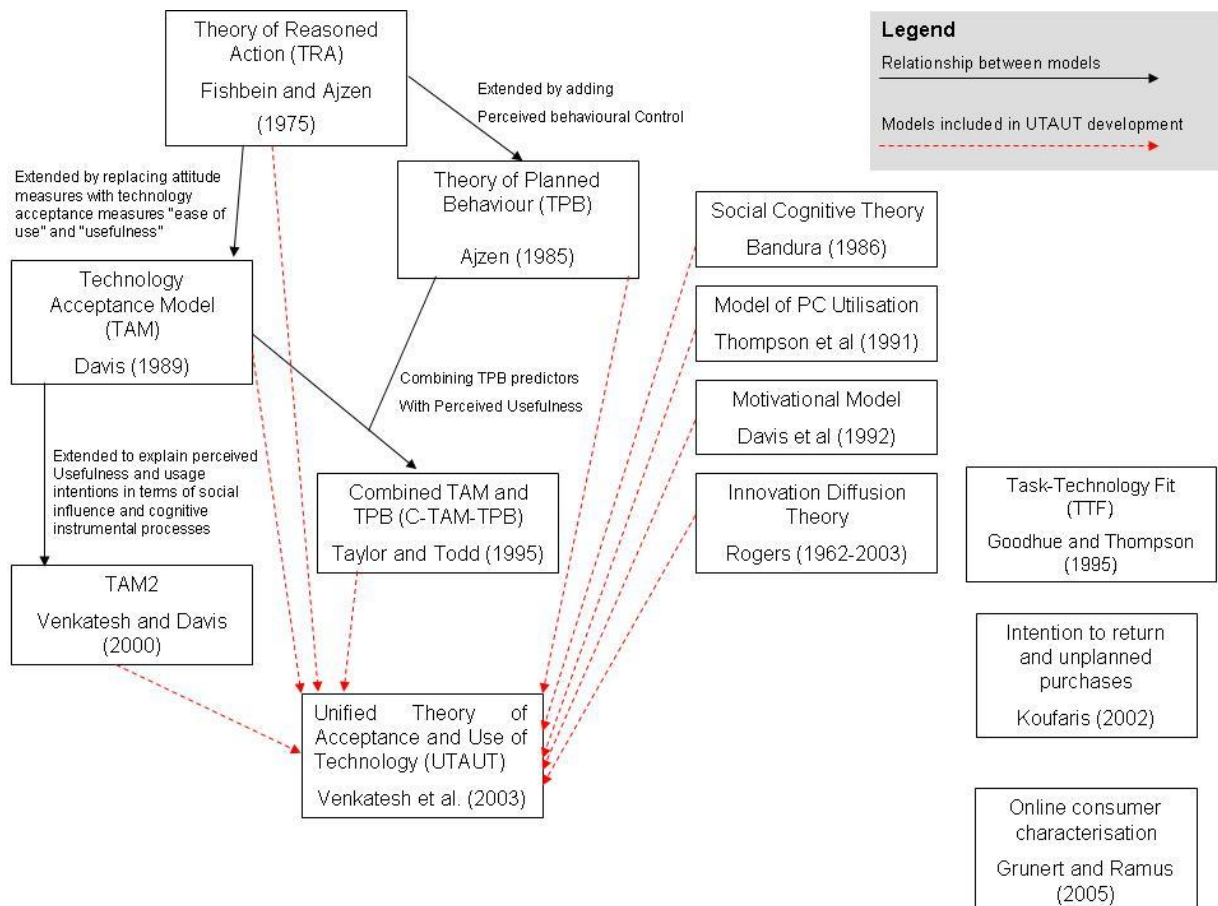


Figure 2: The evolution technology acceptance and adoption models

Source: Claffey and Brady (2008:3)

Within this area of inquiry, there have been several streams of research. One stream focuses on individual acceptance of technology by using intention or usage as the dependent variable (Venkatesh et al., 2003; Compeau and Higgins, 1995; Davis et al., 1989). Other streams have focused on organisation-level implementation (Frambach and Schillewaert, 2002; Leonard-Barton and Deschamps, 1988) or the relationship of task to technology (Yao-Sheng, 2006; Dishaw and Strong, 1999; Goodhue, 1995; Goodhue and Thompson, 1995). To date, extant explanations of why users behave in particular ways toward ICTs have mainly been organisational-based and have focused predominantly on instrumental beliefs as drivers of individual usage intentions (Venkatesh et al., 2007; Barron et al., 2006). As already described, addressing these issues on a consumer basis is a key factor of this research programme.

Venkatesh et al. (2003), in an attempt to integrate the main competing user acceptance models and thus improve the predictability and understanding of technology acceptance, formulated the UTAUT. This model explains an organisational user's intention to use an information system and to define the user's subsequent usage behaviour. The main thrust of the developed model is that four key constructs (facilitating conditions, social influence, effort expectancy and performance expectancy) and four key moderating variables (experience, voluntariness, gender, and age) will directly determine intention and usage behaviour. The UTAUT was developed by consolidating elements across eight key models (i.e. The Theory of Reasoned Action, Technology Acceptance Model, Motivational Model, Theory of Planned Behaviour, The Combined Theory of Planned Behaviour/Technology Acceptance Model, Model of PC Utilisation, Innovation Diffusion Theory, and Social Cognitive Theory) used to predict or explain usage behaviour in relation to information systems as shown in Figure 2.

The UTAUT has improved upon existing technology acceptance models constructs and explains 70% of the variance of intention to use technology whereas the previous models only explain between 17 and 53% of the variance (Venkatesh et al., 2003).

The UTAUT provides a means for capturing technology adoption and usage of information in an organisational setting (Anderson and Schwager, 2006; Pu Li and Kishore, 2006; Reunis et al., 2006; Venkatesh et al., 2003). A modified UTAUT can be generalised with different technologies in focus and on an individual basis in the consumer environment, as verified in a number of recent studies (AbuShanab and Pearson, 2007; Carlsson et al., 2006a; Pu Li and Kishore, 2006). Findings from these studies in relation to usage of the UTAUT are described in the hypothesis section below. Other benefits of using the UTAUT model are that it combines, and builds on existing empirically proven models (Venkatesh et al., 2003), it has been validated in a number of empirical tests (AbuShanab and Pearson, 2007; Anderson and Schwager, 2006; Carlsson et al., 2006b; Pu Li and Kishore, 2006; Venkatesh et al., 2003) and it provides a means to understand the cognitive determinants behind intended adoption and usage of technology (Reunis et al., 2006; Venkatesh et al., 2003).

Limitations related to the UTAUT include that it is organisational based and must be modified for the consumer environment. It is also focused primarily on information systems; therefore, the research instruments must be modified for the technology being studied.

Pu Li and Kishore (2006) advise applying a certain level of caution when interpreting results from studies conducted using UTAUT scales in a consumer environment because there is significant invariance in effort expectancy across groups according to the level of general computing knowledge. Finally, the UTAUT fails to take users psychographic traits into consideration and as many technology-based services cause apprehension in those who lack sufficient experience with the technology, it has become increasingly important to understand the factors affecting consumer attitudes and consumers' psychological traits.

In order to address these limitations, research must consider consumers' levels of technical knowledge, to understand the dynamics of technology adoption among different consumer groups and to gain a deeper understanding of consumers' personal psychological traits (Lin and Hsieh, 2007; Venkatesh et al., 2007; Meuter et al., 2003) which Parasuraman (2000) describes as understanding a consumer's technology readiness.

Measuring Technology Readiness

Rogers (1995) suggests that there are differences in peoples' dispositions towards using technology. Attitudinal and behavioural characteristics appear to be good predictors of purchase behaviour (Baltas, 2003; Goldberg, 1990). Baumgartner (2002) proposes that consumers can be categorised according to characteristic personality profiles and this gives a strong indication of their purchase choice relating to different types of products or services.

Parasuraman (2000:308) defines technology-readiness as people's "propensity to embrace and use new technologies for accomplishing goals in home life and at work". This can be used for understanding the propensity (Parasuraman and Colby, 2001) or mental readiness (Liljandera et al., 2006) of individuals to embrace and interact with technology-based services. The TRI is a framework that measures an individual's readiness to use technology-based services using psychographic characteristics (Massey et al., 2007): optimism, innovativeness, discomfort, and security. According to Parasuraman (2000), optimism and innovativeness are seen to be drivers of innovation, while discomfort and insecurity are seen to be inhibitors. The TRI has been used to categorise and compare consumers in the US (Parasuraman, 2000) and the UK (Tsikriktsis, 2004) and to understand the TR of consumers towards, for example, self-service technologies (Lin et al., 2007; Lin and Hsieh, 2007). Walczuch et al. (2007) used the TRI to explain the relationships between TR and 'perceived ease of use', 'usefulness' and behavioural intention. Their empirical findings verified that 'perceived usefulness' and 'perceived ease of use' together had mediation effects between technology readiness and a consumer's usage intentions.

This literature review has identified a need to deepen understanding of drivers and antecedents behind technology acceptance and adoption from an attitudinal, behavioural and psychographic viewpoint; to increase knowledge related to the concepts of perceived value and stakeholder involvement within the service-dominant logic paradigm; and to enhance the predictive capabilities of established models on a consumer level.

This suggests the requirement for a new model for understanding consumers' technology acceptance which combines the TRI and a modified UTAUT, to provide a more detailed analysis on an individual consumer level, thereby addressing some of key concepts highlighted by the S-D paradigm as described below.

Proposed Research Approach

This study will measure the relationship between the dimensions of the TRI and levels of a modified UTAUT while taking into account moderating variables (as detailed below).

To achieve the goals of this research, user trials of technology-based services, carried out with one of Ireland's leading mobile phone operators, will be used to test the model. This will involve a longitudinal study of new technology-based service beta-trials with consumers. An on-line survey is considered an efficient and effective way to gather data from a large number of consumers in order to empirically test the model (Dillman, 2000; Remenyi et al., 2000). There are a number of key points related to these user trials which support the research requirements:

- The researcher has access to a large sampling frame from the mobile operator's customer base in Ireland, with the potential carry out tests with 800+ users. This should provide increased reliability and validity on previous studies that have used the UTAUT in the consumer environment where sample numbers have ranged between 87 and 307 (AbuShanab

and Pearson, 2007; Carlsson et al., 2006b; Pu Li and Kishore, 2006). In addition, it is critical for this research to have a high sample number as this model will involve testing relationships between a greater numbers of constructs than previous studies.

- Previous research has focused on technologies with which the surveyed group were familiar, for example Internet Chat services (Nysveen et al., 2005) and Internet Shopping (Vijayasarathy, 2004). A number of trial services, to which the consumer groups will be exposed, will be new in the Irish market, thereby ensuring that the customers to be surveyed will have no prior experience. This has the added benefit of allowing the research results to demonstrate the predictive capability of the proposed model as well as ensuring that survey answers are not influenced by existing perceptions of the trial technologies.

- In contrast with many previous studies, these trials will involve real consumers, as opposed to student groups (Su-Houn et al., 2007; Gao, 2005; Jiang et al., 2000) or individuals within an organisational context (Venkatesh, 2000; Venkatesh and Davis, 2000; Venkatesh and Morris, 2000; Lucas and Spitler, 1999).

- It will be possible to gain access to consumers exhibiting all levels of technology readiness, thereby providing data to validate the proposed hypotheses and to provide sufficient data to generalise the results.

Theory and Hypothesis Development

The role of intention as a predictor of behaviour has been well-established in the IS literature (Venkatesh et al., 2003; Ajzen, 1991) and in consumer behaviour research (Lin et al., 2006; Sheppard et al., 1988). Behavioural intention is an indication of an individual's readiness to perform a given behaviour and is assumed to be an immediate antecedent of behaviour (Ajzen, 2002).

Prior studies have reported a significant causal link between behavioural intention and actual usage (Venkatesh et al., 2003; Venkatesh and Morris, 2000; Sheppard et al., 1988; Ajzen and Fishbein, 1980), therefore using behavioural intention as a dependent variable to examine technology acceptance is theoretically justifiable (Venkatesh et al., 2003; Mathieson, 1991).

Consistent with the underlying theory for previous intention models it is expected that behavioural intention will have a significant positive influence on technology usage.

H1: Behavioural intention will have a significant positive influence on usage.

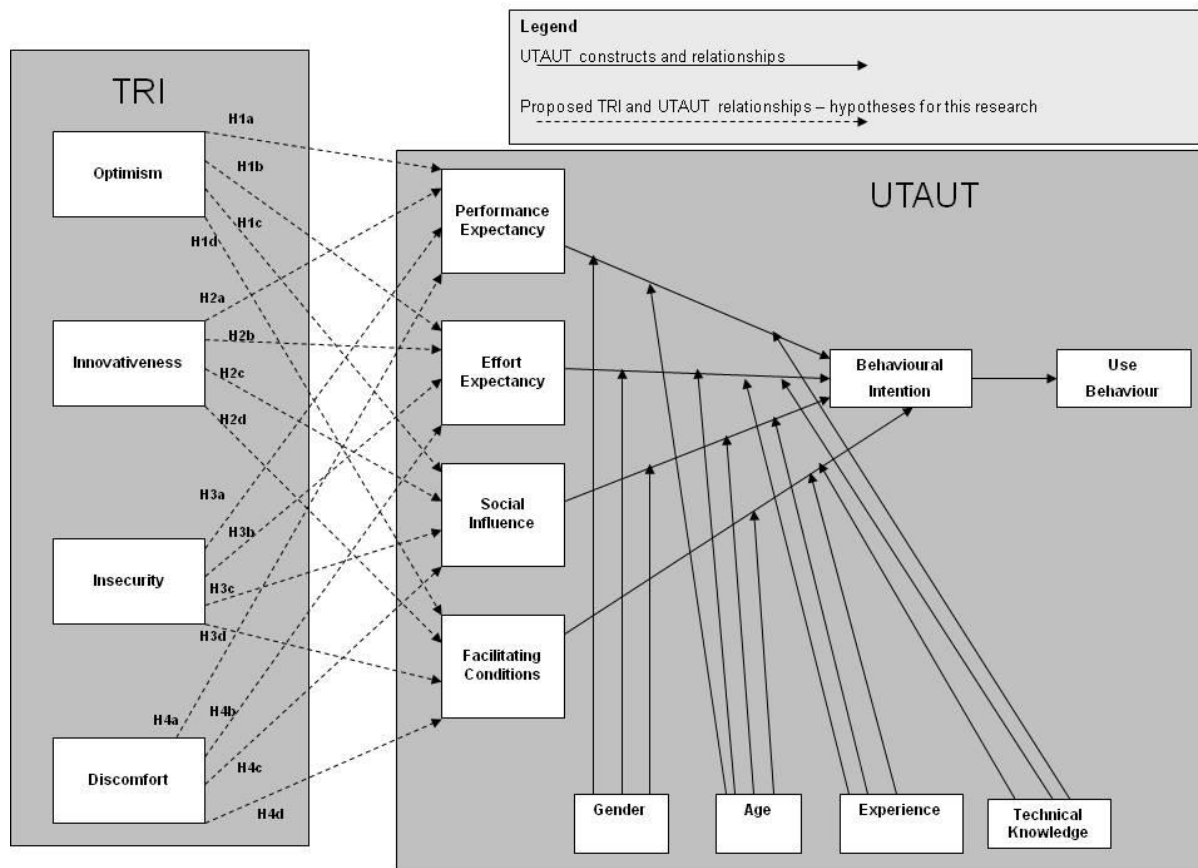


Figure 3: Proposed Research Model - Integrating TRI with UTAUT

Venkatesh et al. (2003:467) describe the UTAUT as “encompassing the combined explanatory power of the individual models and key moderating influences”. UTAUT incorporates four moderator variables, age, gender, experience with the technology, and voluntariness of use of the technology.

However, as Carlsson et al. (2006) note, model adaption is required in order to apply this model in the consumer environment. In the UTAUT, social influence derives from the subjective norm construct, and is centred on an individual’s perception of the beliefs of others. It has been noted that the effect of social influence depends on environmental characteristics such as mandatory/voluntary or, from another perspective, individual base or organisational base (Venkatesh and Brown, 2001; Venkatesh, 2000; Karahanna et al., 1999). The voluntary/mandatory distinction is not applicable to technology acceptance in the consumer environment, and so voluntariness of use is a redundant moderator in this study (AbuShanab and Pearson, 2007; Carlsson et al., 2006b) .

The ‘effort expectancy’ construct is the degree of ease associated with the use of the technology (Venkatesh et al., 2003) and has ‘Perceived ease of use’ is a root construct. Effort expectancy has a direct positive effect on intention to use a technology-based service (Carlsson et al., 2006a).

‘Performance expectancy’ is the degree to which an individual believes that using a technology will help him or her attain gains in performance of the technology-related task (Venkatesh et al., 2003) and has ‘perceived usefulness’ as one of its root constructs. Carlsson

et al. (2006a) modified this construct for the consumer environment by describing performance expectancy as “the expected benefits gained by using mobile services”. They note that the performance expectancy of mobile services has a significant positive effect on behavioural intention. When measuring ‘performance expectancy’, they included elements such as flexibility (using the mobile service anywhere and anytime) and time (saving time and being able to access data in real time).

As described earlier technical knowledge is an important factor influencing technology acceptance and will be added as a moderating variable (Pu Li and Kishore, 2006). Saaksjarvi (2003) describes technical knowledge as a key factor influencing a consumer’s willingness to learn about technologies.

In terms of the psychographic aspects of the model, Parasuraman (2000) states that optimists have a positive view of technology and a belief that it offers increased control, flexibility and efficiency in peoples’ lives. It is important for customers to feel they are in control of technology-based services (Bateson, 2000). Optimists are less likely to focus on negative events, they confront technology more openly and are therefore more willing to adopt technology-based offerings earlier than others (Matthing et al., 2006; Parasuraman and Colby, 2001).

Matthing et al. (2006) state that optimists are above average in terms of resourcefulness and propensity to solve problems in order to effectively use an innovative service. This, therefore, leads to the fact that an optimist perceives a technology as being more useful and easier to use because they worry less about possible negative outcomes (Walczuch et al., 2007; Liljandera et al., 2006).

This, combined with the definition of effort expectancy and performance expectancy, leads to the following hypothesis.

- H_{1a} High consumer optimism about technology in general leads to higher performance expectancy about a specific technology
- H_{1b} High consumer optimism about technology in general leads to lower effort expectancy about a specific technology

Innovators have a tendency to be technology pioneers (Parasuraman, 2000). Saaksjarvi (2003) describes innovativeness as being characterised by extensive technical knowledge and confidence in independently operating new technology. Individuals with high personal innovativeness demonstrate a willingness try out any new technology (Walczuch et al., 2007; Midgley and Dowling, 1978) and have less complex beliefs about new technology (Walczuch et al., 2007; Matthing et al., 2006). Citrin et al. (2000) note that innovators tend to be more at ease with technology because of their positive attitude and intentions. They enjoy problem solving and the chance to exploit their abilities and know-how in order to gain satisfaction (Lüthje, 2004).

Combining this with the description of effort expectancy produces the following hypothesis:

- H_{2b} High consumer innovativeness about technology in general leads to lower effort expectancy about a specific technology

Innovators tend to think that they will “miss certain benefits when not trying out a new technology” (Walczuch et al., 2007: 208) and are more likely to “use innovations even when

their potential value is uncertain and their benefits are not obvious” (Walczuch et al., 2007: 208). Additionally, innovators exhibit high-benefit expectations from new products and services which are often related to the experience of new needs that are not addressed by existing market offers (Lüthje, 2004). This suggests the following hypothesis:

H_{2a} High consumer innovativeness about technology in general leads to higher performance expectancy about a specific technology

Lin and Hsieh (2007) describe computer anxiety as the fear, apprehension and expectations people feel when considering actual use of technology. Meuter et al. (2003) found that a consumer’s technology anxiety is significantly related to a consumer’s avoidance of using a self-service-technology, even when they see the benefits of using the technology. Saaksjarvi (2003) maintains that an individual experiencing insecurity and incompatibility with an innovation rejects it without assessing its advantages and usability. Therefore, it can be hypothesised that an apprehensive individual will consider using a new technology as requiring a higher level of effort:

H_{3b} High consumer insecurity about technology in general leads to higher effort expectancy about a specific technology

Parasuraman and Colby (2001) cite that “Paranoids and Laggards” distrust technology and are sceptical about its ability to work properly. This results in individuals avoiding the use of computers due to an innate fear of technology, often driven by perceived obstacles such as security and privacy (Walczuch et al., 2007; Liljandera et al., 2006). It has been long established that security and privacy concerns are obstacles to technology acceptance (Liljandera et al., 2006; Chen et al., 2002), which can result in suspicion and reduced perceived usefulness of a technology (Walczuch et al., 2007; Venkatesh and Brown, 2001; Davis, 1989). Stating this expectation more formally:

H_{3a} High consumer insecurity about technology in general leads to lower performance expectancy about a specific technology

The other hypotheses related to ‘performance expectancy’ and ‘effort expectancy’ are as follows:

H_{4a} High consumer discomfort about technology in general leads to lower performance expectancy about a specific technology

H_{4b} High consumer discomfort about technology in general leads to higher effort expectancy about a specific technology

Social influence refers to the perceived behavioural expectations of important individuals in the user’s life (Venkatesh et al., 2003). It is assumed that these beliefs determine the prevailing subjective norm – the perceived social pressure to engage or not to engage in a behaviour (Venkatesh et al., 2003). Bandura (2001) posits that portions of an individual’s knowledge acquisition can be directly related to observing others within the context of social interactions, experiences, and media influences. It is based on this premise that environmental influences such as social pressures or unique situational characteristics, cognitive and other personal factors including personality as well as demographic characteristics, and behaviour are reciprocally determined.

A logical extension of this would be to say that if a user has a higher classification in the TRI, then it is more likely that their normative belief towards a technology would be more

positive. For example, if an individual is classified as an optimist, it is likely that they are less influenced by negative attitudes of others towards a technology.

The following hypotheses encapsulate this notion:

- H_{1c} High consumer optimism about technology in general leads to lower social influence related to a specific technology
- H_{2c} High consumer innovativeness toward technology in general leads to lower social influence related to a specific technology
- H_{3c} High consumer insecurity about technology in general leads to higher social influence related to a specific technology
- H_{4c} High consumer discomfort about technology in general leads to higher social influence related to a specific technology

Facilitating conditions refer to the degree to which an individual believes that a support infrastructure exists to assist with use of the system (Venkatesh et al. 2003) or technology (Carlsson et al., 2006). Facilitating conditions incorporates ‘perceived behavioural control’ which has been empirically validated to indicate that user’s behaviour is strongly influenced by their confidence in their ability to perform the behaviour in question (Venkatesh et al., 2003; Ajzen, 2002; Buchanan et al., 2001). Carlsson et al. (2006) describe facilitating conditions as being the guidance and support an individual receives when learning to use or adopting a new service. This can include support from service providers, the manufacturer, the retailer, friends or family. From this it is reasonable to infer that depending on a user’s TRI category they will perceive that they have a greater or lesser degree of control over, and support for, the adoption of a technology-based service. This leads to the following hypotheses:

- H_{1d} High consumer optimism about technology in general leads to higher facilitating conditions about a specific technology
- H_{2d} High consumer innovativeness toward technology in general leads to higher facilitating conditions about a specific technology
- H_{3d} High consumer insecurity about technology in general leads to lower facilitating conditions about a specific technology
- H_{4d} High consumer discomfort about technology in general leads to lower facilitating conditions about a specific technology.

Contribution of Research

This research will provide an integrated model of technology adoption and usage that will enhance marketers’ understanding of the relationship between psychographic characteristics and technology-based service adoption behaviour. It will provide a deeper insight into the behavioural processes behind consumers’ adoption of technology-based services. In addition to providing marketers with an understanding of consumer’s perceived value and intended usage of a service, it can serve as a useful framework for future service design (for example, by understanding performance expectancy for a service, an organisation can adapt the feature set of the service to address consumer issues in this regard). A deeper insight into the psychological reactions of consumers towards technology-based systems is needed to provide useful insights pertaining to issues such as the types of systems most appropriate, the pace at

which the systems should/could be implemented and the types of support needed to assist customers experiencing problems with technology-based systems. This information comes from understanding consumers' psychographical characteristics and the linkages between these and constructs such as effort expectancy or performance expectancy in relation to usage behaviour towards a technology-based service.

Specifically, addressing the foundational premises defined within the service-dominant logic paradigm, the proposed model will address the following core elements:

- Goods as service delivery mechanisms – this research will use mobile services as the technology-based services utilised during the user trials and hypotheses testing. Mobile services are examples of the type of “service” being discussed in the context of service-dominant logic, therefore the research will have the correct foundational focus.
- Knowledge as a fundamental source of competitive advantage – this research and the proposed model will provide marketers with richer information on the consumer, their personality traits, and their potential adoption and usage of technology-based services. For example, as described earlier this detailed level of knowledge will allow marketers to understand where additional help/support could be added to a service in order to increase consumers' usage intention.
- Co-creation of value – as described in the literature review, the usage of a provided service is the catalyst for value creation, and it is imperative for marketers to understand the drivers and antecedents behind that usage as a means to appreciating consumers' perceived value of a technology-based service. This is the core focus of the proposed model and research. In addition to facilitating this understanding, utilising the developed model can allow organisations to integrate consumers in the service creation process at an earlier stage, for example, consumers can be invited to participate in beta trials for services whereby their perceptions of a service can be tested.
- Stakeholders' right to satisfy needs and wants – the literature review has identified the necessity to collaborate with, and learn from, customers, and for service providers to be responsive to their individual needs. The proposed model provides a means to understand consumer needs and wants in relation to issues such as performance expectancy and facilitating conditions.
- Value determined by the beneficiary – as described in the literature review, it is crucial to understand consumer's perceptions of the level of value within a service. The proposed model exposes the level of value perceived by the user of a service in terms of their intention to use, performance expectancy, effort expectancy and social influence.

In addition to supporting the foundational premises of the service-dominant paradigm, integrating the TRI with the UTAUT will also broaden the scope of current research and generalisability of present technology acceptance models, by adding the dimension of psychographic characteristics, thereby improving the amount of variance explained in the dependent variable. As described in the proposed research approach, a consumer beta-trial project to be used to gather the required data for analysis and will provide the researcher with access to a large base of consumers, each of whom can be exposed to a number of services they have not previously experienced, thereby ensuring that the proposed hypotheses can be generalised. This is a significant improvement on past technology acceptance studies where survey respondents were exposed to a single service (Marchewka and Kostiwa, 2007;

Vijayasathy, 2004; Lu et al., 2003; Bajaj and Nidumolu, 1998; Venkatesh and Davis, 1996), and in the majority of cases to a service they were already familiar with (Marchewka and Kostiwa, 2007; Carlsson et al., 2006a).

Conclusion

The development of ICTs, such as the internet and mobile communications, have revolutionised the consumer marketplace. In addition, ICTs have significantly altered the service landscape with companies increasingly using technology within their service offerings. The reviewed literature identifies the advantages and complexities that are exhibited in technology-based service offerings which present new challenges for organisations and academic researchers alike in terms of understanding the psychographic characteristics and cognitive behavioural antecedents that drive adoption and usage within the service-dominant paradigm.

This research addresses these challenges, and the identified gap in commercial and academic knowledge, by suggesting a new model for understanding consumers' technology acceptance which is cognisant of the antecedents of behavioural intention coupled with psychographic characteristics, or technology readiness (TR). The research programme proposes to expose consumers to a number of technology-based service offerings, and to gather data to verify the proposed hypotheses to an extent that the results can be generalised, and thereby applied to marketing practice and academic theory.

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