

Exploring UK consumer perceptions of mobile payments using smart
phones and contactless consumer devices through an extended
Technology Adoption Model.

Thesis submitted in accordance with the requirements of the University
of Chester for the degree of Doctor of Philosophy

by Colin Christopher Hampshire



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Declaration

This work is my own, is original
and has not been submitted previously for any academic purpose.

Signature: *Chris Hampshire*

Date: 20th June 2016

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Chris Hampshire

Abstract

Exploring UK consumer perceptions of mobile payments using smart phones and contactless consumer devices through an extended Technology Adoption Model by Chris Hampshire.

Widespread adoption of mobile payments has not taken place despite a decade of trials in various countries based upon a mobile phone handset that does not have the technology capabilities of today's smart phones. However, significant technology developments have led to widespread consumer adoption of smart phones and other devices that may now provide the foundation for wider consumer adoption of mobile payments. Understanding UK consumer cultural perceptions on the new phenomenon is one of the first steps to influencing purchase behaviour. This thesis is based upon a post-positivist philosophy and a social constructionist ontology that explores UK consumer perceptions of mobile payments through human cognitive and affective responses of consumer payment behaviour as these influence attitude that leads to adoption. However, UK consumer interest in mobile payments on its own is unlikely to be enough to change payment behaviour, although meeting specific payment needs can motivate consumers to amend their payment behaviour that can lead to widespread adoption.

Inductive empirical research is used to explore UK consumer perceptions of mobile payments through sequential mixed methods. A questionnaire is used as the 1st research instrument with closed questions that explore various aspects of consumer interest in the mobile payments phenomenon. The key themes identified from the numerical analysis of the questionnaire data are used to guide the semi-structured interviews. Content analysis is then undertaken on the qualitative interview data from which new knowledge on consumer perceptions of mobile payments is identified.

Analysis of the empirical data suggests that UK consumers have significant technology and security concerns which negatively affect consumer interest. Despite these concerns, UK consumers demonstrate interest in the mobile payments phenomenon when perceived usefulness benefits are identified. The perceived usefulness positively influences attitude that overcomes perceived risks which can lead to amended consumer payment behaviour and widespread adoption. In addition, UK consumers have a significant lack of trust towards unknown organisations as well as new market entrants although there is an increased level of trust in mobile payments provided by UK banks as well as other established organisations.

This research fills an important gap in existing literature on consumer payment behaviour as it explores UK consumer cultural perceptions of the mobile payments phenomenon using smart phones and contactless consumer devices; whereas earlier consumer payment research is based upon a mobile phone handset that does not have the technology capabilities of today's smart phones and has an Asian and Nordic cultural focus. Furthermore, this research provides UK empirical evidence that refines and extends existing research through the use of sequential mixed methods whilst adding to the understanding of UK consumer attitudes related to UK payment instruments.

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Glossary of Terms used in this Thesis

Term	Definition
Contactless Payments	The use of a portable device to exchange financial value through the use of wireless technologies.
Contactless Smart Cards	The use of smart card to exchange financial value through the use of a payment card based on microprocessor chip card technology with wireless capability.
Europay, MasterCard and VISA (EMV) smart card	A global standard for payment cards based on microprocessor chip card technology defined by Europay, MasterCard and VISA. These payment chip cards contain an embedded microprocessor (a type of small computer) that provides enhanced security features and other technology capabilities not possible with traditional magnetic stripe cards.
Mobile Banking	The use of a mobile phone or other mobile device e.g. tablet computer or smart phone to undertake mobile banking functions including: <ul style="list-style-type: none"> - Review bank account information, initiate an outward payment and transfer funds between bank accounts using the mobile device's wireless technology. - Set up text alert receipts for account balance information. - Send a text request for service requests including account balance enquiry.
Mobile Applications (Apps)	Computer software applications that run on various consumer held mobile devices designed to fulfil a particular purpose.
Mobile Network Operator (MNO)	A telephony company that provides services for mobile phone subscribers through the deployment of equipment, most notably the radio transmitter network and the core network to support call switching and mobile management functions.
Mobile Payment	The use of any portable object e.g. mobile phone, laptop PC, tablet computer, smart card and wrist watch that has the relevant technology with wireless capability to transfer money electronically between two parties (Bourreau & Verdier, 2010).
Near Field Communications (NFC)	A short-range high frequency wireless technology that is an expansion of RFID technology which enables the communication between devices over a distance of less

	than 10cm and is used in consumer electronics, mobile devices and PCs (Polasik, Gorka, Wilczewski, Kunkowski & Przenajkowska, 2010).
Personal Identification Number (PIN)	A number entered into a point-of-sale device by the consumer that is used to authenticate a card initiated payment transaction in a secure manner.
Portable devices	A portable consumer device with wireless connectivity that includes mobile phones, smart phones, tablet computers, wrist watches and other consumer focused technology devices.
Subscriber Identification Module (SIM)	Securely stores the international mobile subscriber identity based on chip card technology. These chip cards contain an embedded microprocessor (a type of small computer) that provides enhanced security features and other technology capabilities used to identify and authenticate mobile telephone subscribers.
Smart phone	A mobile device that is compact in size and only slightly bigger than a standard mobile telephone which supports phone calls, email access, internet access, download files and application systems (Osman, Sabudin, Osman and Shiang-Yen, 2011; Verkasalo, Lopez-Nicolas, Molina-Castillo and Bouwman, 2010)
Tablet computer	A wireless portable personal computer with a touch screen interface and a wireless adapter for Internet and local network connection that are typically smaller in size than a notebook computer but larger than a smart phone.

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1 Introduction to the research

This chapter introduces the research that explores UK consumer interest in mobile payments with smart phones and other contactless consumer devices, which is a relatively new phenomenon in the UK, through assessing cognitive and affective UK consumer responses that are part of human psychology. The cognitive and affective responses are evaluated using perceived usefulness, perceived ease of use, perceived trust and perceived risk as these influence consumer payment attitude and behaviour that can lead to adoption.

The research problem and how this led to the formulation of the research statement and the associated research objectives are presented within the existing body of knowledge before going on to describe and justify the conceptual framework on which this thesis is based. The chapter concludes by explaining the importance of this research followed by an overview of the thesis.

1.1 Personal significance of this study

The researcher has extensive banking and electronic payment practitioner experience having held various executive and senior management positions in a number of financial institutions in UK and continental Europe. The researcher undertook an MBA at University of Chester Business School that assessed Lloyds TSB's mobile banking usage and graduated with a distinction in 2011. Undertaking the MBA established a personal research interest that resulted in this research and the production of the thesis. The researcher's practitioner background in the UK electronic payments market and the motivations for this research are divulged in recognition of their influence on this research.

1.2 The research problem

Globalization and increasing prosperity in societies produces an increased demand for goods and services that require efficient payment systems to support this trade (Hassan & Kaynak, 2013). Whilst cash is an established payment method, consumers around the world are adopting an increasing range of electronic payment systems in order to pay for goods and services. A mobile payment is a consumer initiated payment

service that is an innovative consumer focused electronic payment system and is a relatively new phenomenon in the majority of western European countries (Diniz, de Albuquerque & Cernev, 2011). However, despite a decade of mobile payment trials in various countries based upon a traditional mobile phone handset widespread consumer adoption of mobile payments has yet to occur (Zhou, 2014).

The recent widespread adoption of consumer based technology (Ling, 2004), self-service technology adoption (Bolton & Saxena-Iyer, 2009) and the widespread adoption of smart phones (IDC, 2015) has resulted in consumer oriented technology becoming an integral part of, and embedded in today's society (Drucker, 2011). This recent technology adoption by consumers provides a foundation for potential consumer adoption of mobile payments and creates a broad range of new research opportunities that can add to the existing body of knowledge on consumer behaviour, consumer payment behaviour and consumer technology adoption.

Existing literature on consumer payment behaviour indicates that pre-purchase psychological conditions determine consumer needs and desires which influences attitude that leads to intention and then adoption (Blackwell, Miniard & Engel, 2006). A clear relationship exists between consumer attitude, behaviour and choice of payment instrument that is used in consumption (Ondrus, Lyytinen & Pigneur, 2009; Viehland & Leong, 2007). Furthermore, existing literature on the mobile payments phenomenon indicates how consumers experience and understand mobile payments within the social context of a specific consumer device – the mobile phone (Liebana-Cabanillas, Fernandez & Munoz-Leiva, 2014; Shin, Lee & Odom, 2014; Swilley, 2010). However, continued technology developments have produced an increased range of personal and portable computing devices that can support mobile payments and these technology devices have been adopted by consumers including smart phones, contactless smart cards, tablet computers, watches and glasses (Apple, 2014a; Google, 2014; Little, 2011; Samsung, 2014; Swatch, 2015).

Exploring UK consumer payment behaviour, and more specifically UK consumer perceptions of mobile payments with other consumer self-service technology mobile devices, beyond the historical perspective of a mobile phone handset provides a broad

range of research opportunities. In addition, exploring the recent widespread consumer adoption of self-service technology (Ling, 2004) and the influence on consumer payment behaviour provides further opportunities that will contribute to the re-evaluation of previous research findings on the mobile payment phenomenon.

Money is based upon the concept that it is a medium of exchange with a specific amount and is a means of storing, transporting and transferring abstract value (Flatraaker, 2008; Grierson, 1977; Keynes, 1930). Early coins became known as money and are tokens with a standardised value that were accepted as an exchange of value or payment (Innes, 1913) from the recipient of the goods or service to the provider (Einzig, 1966; Ferguson, 2008). This token was typically a metal with intrinsic value and became the widely accepted medium of exchange that is in regular use in today's societies (Spufford, 1988). However, the development of computer technology led to the evolution of electronic money and payments that are electronic messages used to transfer financial value from one party to another which replace the physical exchange of coins or bank notes (Furst, Lang & Nolle, 1998). Electronic money is an everyday experience for consumers according to Bounie and Francois (2006) and electronic payments are an integral part of everyday life such that they are indistinguishable from it (Weiser, 1991).

The evolution of communications in the Information Age provided the foundation for the subsequent development of mobile payments which is a recent phenomenon (Diniz et al., 2011). Communications extended electronic payments so that transferring financial value remotely is possible using portable consumer technology devices including mobile phones and other mobile devices such as contactless smart cards. However, Davies (2002) suggests that UK consumers remain firmly attached to paying for goods and services with the traditional methods of coins and bank notes and the cashless society using efficient electronic payment messages is a banking dream.

Mobile payments entails a large number of stakeholders and a complex environment that includes information technology, applications, technology infrastructure, consumers, retailers, point-of-sale terminals and technology communications (Rochet & Tirole, 2002). Initially, mobile payments were based upon the use of a mobile phone

handset for the transfer of financial value (Kim, Mirusmonov & Lee, 2010; Ondrus & Pigneur, 2005; Pousttchi, 2004; Zong, 2009) which produced varied adoption rates in different countries. Mobile payment adoption has been successful in Japan where 92.9% of consumers are aware of their mobile phone's electronic wallet capability (Amoroso & Magnier-Watanabe, 2012; Wall Street Journal, 2011) but also in other countries in Asia where mobile wallets have already become a mainstream phenomenon (Yang, 2005) as well as Canada where 20% of shoppers have adopted and use mobile payments (Canadian Imperial Bank of Commerce, 2014). However, fast diffusion and adoption of mobile payments by consumers around the world has not yet taken place (Ondrus et al., 2009; Ondrus & Pigneur, 2005). Nevertheless, the mobile payment phenomenon continues to rapidly evolve (MasterCard, 2012a; VocaLink, 2013) with various organisations establishing different complex requirements to support consumer adoption including Vodaphone (2015b) who are providing mobile wallets and LGPay (2015) who join ApplePay (2015a) and SamsungPay (2015a) as smart phone handset manufacturers entering this market. In addition, recent technology development has resulted in Near Field Communications (NFC) capability being available on smart phones which has led to mobile contactless payment capability independent of a Mobile Network Operator (MNO) according to VISA (2015a). As a result, various banks and other payment organisations have indicated their adoption of this technology to support their mobile payment service (ANZ, 2015; Commonwealth Bank of Australia, 2015; Microsoft, 2015).

The more recent consumer based technology developments have extended the choice of consumer devices from which to make a mobile payment including a mobile phone handset and a MNO (Finextra, 2012a); Europay, MasterCard and VISA (EMV) smart card for contactless card payments (Barclaycard, 2009; Finextra, 2010; HSBC, 2012; Lloyds TSB, 2011, Post Office, 2012); and tablet computers, watches and glasses (Apple, 2014a; Google, 2014; Little, 2011; Samsung, 2014; Swatch, 2015).

Mobile payments is a relatively new UK phenomenon and consumer intentions have been identified as a good predictor of subsequent adoption (Jackson, Chow & Leitch, 1997; Szajna, 1996) despite technology assessment being a highly complex activity (Ondrus & Pigneur, 2005). As a result, exploring UK consumer perceptions of mobile

payments using cognitive and affective responses that are part of human psychology is an effective approach to identifying consumer interest that leads to adoption. However, consumers are generally reticent at changing their payment habits which includes the choice of payment instrument (Viehland & Leong, 2007) unless the right incentives apply and specific consumer benefits can be identified and understood (Meuter, Ostrom, Roundtree & Bitner, 2000; Riggins, Kriebel & Mukhopadhyay, 1994).

Whilst there are a number of different ontological and epistemological views of the world, consumer perceptions of the mobile payments phenomenon cannot actually be detected using cognitive and affective psychology responses as reality is socially constructed based upon how each consumer makes sense of the phenomenon within their own world rather than describing an objective world (Ritchie & Lewis, 2003; Stake, 1995). A social constructionist ontology is used for this research as mobile payments reality does not have an objective pre-existence and cause and effect can only be theoretical (Bryman, 2012; Easterby-Smith, Thorpe & Jackson, 2012; Huberman & Miles, 2002).

1.3 Research Aims

Research Statement:

An empirical exploration of UK consumer perceptions of mobile payments through the application of an extended Technology Adoption Model (TAM).

Research Objectives:

Previous research has explored Asia and Nordic consumer interest in the mobile payments phenomenon which this research extends as it seeks to better understand UK consumer cultural perceptions of mobile payments as perceptions affect attitude which influences adoption. Consumer perceptions are a subjective reality that is socially constructed based upon how each individual consumer makes sense of the phenomenon within their own world (Ritchie & Lewis, 2003) whilst exploring consumer perspectives of information technology based services is a highly complex activity (Ondrus & Pigneur, 2005).

Existing literature and empirical studies of mobile payments are used to frame the following research objectives that guide this research within the research statement identified above:

- To explore UK consumer cognitive responses based upon the effect that personal characteristics, perceived trust and perceived risk of the mobile payments phenomenon have on perceived usefulness and perceived ease of use.
- To explore UK consumer affective responses based upon the effect that perceived usefulness and perceived ease of use of mobile payments phenomenon have on consumer attitude.

A cognitive response is a thought generated in response to a persuasive communication that produces a consumer attitude change (Petty & Cacioppo, 1996). An attitude change is influenced by the way the consumer manipulates, elaborates and integrates information but is also influenced by the way the consumer relates the information to pre-existing thoughts and ideas that they already have on the phenomenon (Greenwald, 1968).

An affective response is an emotional reaction that is generated from a specific situation identified through a cognitive response which is an evaluative response that is not based upon simple knowledge as it includes feelings, preferences, intentions and favourable or unfavourable judgements (Lambin, 2007). An affective response is an umbrella term for a set of concepts that include emotions, moods and feelings (Liljander & Mattsson, 2002; Russell, 2003) that play an integral role in human motivation (Isen & Reeve, 2005) which influence reflexes, perceptions, cognition and social judgments that impact behaviour (Forgas & George, 2001).

Perceived ease of use is the degree to which an individual expects an information system to be free of effort whilst perceived usefulness is the degree to which an individual believes that using an information system enhances performance (Davis, 1989). Perceived ease of use has been identified as having a substantial effect on consumer intention to use mobile payments, although results vary (Kim et al., 2010; Mallat, 2007). Moreover, perceived usefulness is a vital element in encouraging

consumers to change their payment habits (Ho & Ko, 2008) which are affected by various factors including cultural beliefs and values, social aspirations and inhibitions (Yang et al., 2012).

Perceived trust is defined by Chellappa and Pavlou (2002, p.359) as “the subjective probability with which consumers believe that a particular transaction will occur in a manner consistent with their confident expectations” although Sabel (1993) defines trust as mutual confidence that no party to a transaction will exploit any vulnerability. However, Yan, Md-Nor, Abu-Shanab and Sutanonpaiboon (2009) suggest that trust is a complex concept and consumers can trust, or distrust, various inter-related parts of a complex phenomenon (Medhi, Ratan & Toyama, 2009). Although various definitions of trust exist, there is a consistent theme of an activity being successfully completed that has no detrimental impact on the parties whilst Social Exchange theory suggests that when a consumer expectation is met, trust is established (Blau, 1964). In addition, initial trust and experiential trust are identified by Kim, Shin and Lee, (2009) and are affected by different factors. Initial trust decisions cannot be based upon prior experience as this does not exist with a new phenomenon, such as mobile payments (Koufaris & Hampton-Sosa, 2004; McKnight, Cummings & Chervany, 1998). As a result, each consumer undertakes a risk assessment on which initial trust is based (Kim & Prabhakar, 2004) whilst convenience and flexibility contribute to the formation of initial trust (Koufaris & Hampton-Sosa, 2004).

Perceived risk is the probability of something happening and the consequences of the outcome should the risk actually happen (Cunningham, 1967). However, risk and trust are inter-related in a consumer’s decision making process according to Morrison and Firmstone (2000) as trust is an effective method to address perceived risk and any related uncertainty that may arise (Gefen, 2000). Furthermore, the perceived level of risk diminishes when trust is established between two parties according to Featherman and Pavlou (2003).

Perceived risk is important to consumers in the early life-cycle of a new phenomenon (van der Heijden, 2002) whilst consumers have a higher degree of trust in a global payment brand (Sun & Sun, 2012). In addition, the reputation of the mobile payment

provider is an important trust building factor for mobile payment adoption (Chandra Srivastava & Theng, 2010) whilst traditional organisations with a well-established brand and reputation can extend this into mobile payments through the trust transfer process which benefits established organisations (Kuan & Bock, 2007; Zhou 2014). However, unless a specific consumer need is identified and fulfilled, consumers are highly unlikely to change their habits (Sathye, 1999). As identified, one of the key provisos for successful UK consumer mobile payment adoption is initially establishing consumer interest (Mallat, 2007) and then motivating consumers to amend their payment habits which leads to adoption of the new payment phenomenon (Ho & Ko, 2008; Riggins et al., 1994).

Despite widespread adoption of portable consumer based technology devices with electronic communications (IDC, 2015, Ling, 2004), widespread consumer adoption of mobile payments has not yet transpired. However, the recent adoption of contactless payments in specific markets may form the catalyst for a much wider consumer adoption of mobile payments. This theory is supported by a number of large and well established organisations who have invested substantially in various mobile payment schemes over the last few years including American Express, (2014) Apple (2015), Banco Santander (2012), Barclaycard (2009), Deutsche Telekom (2012), Google (2015), La Caixa (2012), Lloyds TSB (2011), MasterCard (Finextra, 2012a), Microsoft (2015), VISA (2012b) and VocaLink (2015a).

Empirical UK consumer data is obtained to address the research objectives using sequential mixed methods with an inductive approach based upon a questionnaire as the 1st research instrument that produces quantitative data which is subsequently analysed to produce elementary numerical statistics. The questionnaire analysis and findings are then used to guide the subsequent semi-structured interviews that are used as the 2nd research instrument which produces qualitative data that Saunders, Lewis and Thornhill (2012, p.167) refer to as “sequential explanatory research design”. Furthermore, the use of sequential mixed methods research and 2 separate research instruments assist in validating the research findings (Webb, Campbell, Schwartz & Sechrest, 2000). Whilst this empirical exploratory research on UK consumer perceptions of mobile payments is based on, and informed by, Social Science literature

from Psychology, Sociology, Consumer Behaviour and Science and Technology, the detailed research methods used are described and justified in Chapter 5 - Research Philosophy, Strategy, Design and Administration.

1.4 The empirical context

Over the last decade considerable research has been undertaken on consumer adoption of mobile payments, predominantly based upon a mobile phone device in the Asia and Nordic countries in order to understand why the optimistic expectations for the fast diffusion of the phenomenon has not taken place despite the numerous pilot schemes in various countries (van Biljon & Kotze, 2008). Previous empirical research has been undertaken on different aspects of technology adoption covering business adoption (Legris, Ingham & Colletette, 2003; Tabak & Barr, 1999) and consumer adoption (Agarwal & Prasad, 1999; Kleijnen, Lee & Wetzels, 2009; Saaksjarvi, 2003; Walker & Johnson, 2006; Zakour, 2004).

Moreover, as smart phone adoption has increased substantially (IDC, 2015, Ling 2014) with 70% of the world's population owning at least one mobile phone handset (Osman, Talib, Sanusi, Shiang-Yen & Alwi, 2012) considerable empirical research, predominantly using quantitative methods, has been undertaken on smart phone service adoption (Choudrie, Pheeraphuttharangkoon, Zamani & Giaglis, 2014); Harris, Rettie & Kwan, 2005; Osman et al., 2011; Osman et al., 2012; Park & Chen, 2007; Ting, Lim, Patanmacia, Low & Ker, 2011; Verkasalo et al., 2010). Substantial empirical research has also been undertaken on mobile banking adoption with smart phones (Gu, Lee & Suh, 2009; Kim et al., 2009; Koenig-Lewis, Palmer & Moll, 2010; Lee & Chung, 2009; Luarn & Lin, 2005; Yao & Zhong, 2011) and more specifically mobile payment adoption with smart phones (Arvidsson, 2014; Dahlberg, Mallat, Ondrus & Zmijewska 2008; Liebana-Cabanillas et al., 2014; Shin, 2009; Shin et al., 2014; Swilley, 2010).

Furthermore, the role of security and trust are extensively studied aspects with many conceptual articles on mobile payments but little empirical research that is well founded on theory according to Dahlberg et al. (2008). Furthermore, Arvidsson (2014) identifies that there is a commonality across the various studies that assess consumer adoption of mobile payments that cover payment services and technology research

based upon the TAM proposed by Davis (1989) and the Diffusion of Innovation (DoI) theory proposed by Rogers (1983).

1.5 The conceptual framework

Whilst there are different philosophies and approaches that can be used to explore UK consumer psychological perspectives of the mobile payments phenomenon this research is based upon a post-positivist philosophy with a social constructionist ontology using an inductive approach. This approach is chosen in order to better understand the empirical data that is obtained from UK consumers based upon the conceptual model that is developed, justified and used for this research and from which new knowledge is subsequently generated. Furthermore, this research uses two separate sequential research methods to explore UK consumer perceptions of the phenomenon within the UK payments market with a questionnaire as the first research instrument that produces quantitative data that is analysed to produce some numerical statistics. These assist in focussing the approach to the semi-structured interviews that are undertaken as the second research method. The semi-structured interviews investigate in-depth the key UK consumer psychology perspectives of the new mobile payments phenomenon which produces qualitative data that is subsequently evaluated using content analysis which classifies and categorises the narrative and key words through text analysis in order to identify the new mobile payments knowledge (Silverman, 1993). An initial analysis of the interview data is undertaken immediately after each interview in order to identify any key themes that are then used in the subsequent interviews which is referred to as adopting the research lens according to emerging themes according to Silverman (2009).

Several different theoretical models have been used to study user acceptance, adoption, and consumer behaviour according to Ndubisi and Jantan (2003) and the TAM is used as the underlying model for this research which is an adaptation of the Theory of Reasoned Action (TRA) proposed by Fishbein and Ajzen (1975). Other theoretical models focus on different domains or different levels of analysis whilst the TAM investigates factors related to consumer cognitive dimensions and affective responses that determine behavioural response. However, the TAM assumes that

there are no barriers to prevent a consumer from using a particular information technology system if he or she has chosen to do so but also generally assumes that there is only one single technology system available (Mathieson, Peacock, & Chin, 2001).

The TAM is based upon two central constructs of perceived usefulness and perceived ease of use that reside within the cognitive response area of human psychology. These two central constructs of TAM influence consumer acceptance that can lead to subsequent adoption of technology (King & He, 2006) on which mobile payments are based although there are many meanings of perceived ease of use and perceived usefulness (Chau, 1996; Moore & Benbasat, 1991; Segars & Grover, 1993). However, despite the different meanings, the TAM is a popular research model due to its parsimony along with the wealth of empirical support (Adams, Nelson, & Todd, 1992; Agarwal & Prasad, 1999). The TAM is one of the most important research models out of the 20 technology usage models as it provides the basic structure for many adaptations according to Chau (1996).

Furthermore, the TAM is considered a sound, robust, parsimonious, powerful and influential model to determine consumer acceptance and consumer behaviour related to technology (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989; Igarria, Zinatelli, Cragg, & Cavaye, 1997; Venkatesh, 2000). There is also common agreement that the TAM is valid for predicting consumer acceptance of various differing information technologies including mobile payments (Adams et al., 1992; Chin & Todd, 1995; Doll, Hendrickson & Deng, 1998; Segars & Grover, 1993). However, there is a wide variation of results produced from the use of the TAM and its various derivatives according to King and He (2006) who identify four categories of TAM modifications:

- Situational involvement (Jackson et al., 1997) and personal computer self-efficacy (Davis & Venkatesh, 1996).
- Factors such as risk (Featherman & Pavlou, 2003; Pavlou, 2003) and trust [Gefen, 2004; Gefen, Karahanna & Straub, 2003b).
- Factors such as gender and culture (Straub, Keil & Brenner, 1997) and technology characteristics (Plouffe, Hulland & Vandenbosch, 2001).

- Consequence measures such as attitude (Davis et al., 1989) and actual system usage (Davis & Venkatesh, 2004).

While TAM provides a reliable and valid model to explore consumer attitude towards technology adoption that includes mobile payments, it was originally developed for the organisational context. As a result, the TAM has been criticised for supplying very general information on consumer opinions of technologies; for having a deterministic approach without much consideration for individual consumer characteristics and for assuming that usage is volitional without constraints (Agarwal & Prasad, 1999; McMaster & Wastell, 2005). In addition, the TAM does not consider social influence in the adoption of new technologies, whilst there is a growing trend to extend the TAM with various other motivational factors including additional variables for specific contexts. Marketing literature recognises that perceived risk and trust are important factors that influence consumer behaviour and have been included in an extended TAM (Chang & Wu, 2012; Peter & Tarpey, 1975). Consumers indicate concerns over mobile payment security and privacy (Dewan & Chen, 2005) but very few studies have considered these aspects, and even then the focus is on the technical aspects of security and neglect consumer dimensions such as perceived security, perceived risk and perceived trust. As a result, Shin (2009) suggests that consumer perceptions of security and privacy concerns may be important aspects that affect attitude and subsequently adoption.

The majority of mobile payment adoption research has referred to technology in a general sense with no specific consideration of different payment scenarios or technologies according to Slade, Williams, Dwivedi and Piercy (2014). In addition, a number of technology studies have examined adoption of specific mobile payment systems including China (Lu, Yang, Chau & Cao, 2011); Germany (Schierz, Schilke & Wirtz, 2010) and Spain (Liebana-Cabanillas, Sanchez-Fernandez, & Munoz-Leiva, 2014). Furthermore, two studies have explicitly examined adoption of NFC based mobile payments in Malaysia (Leong, Hew, Tan, & Ooi, 2013; Tan, Ooi, Chong, & Hew, 2014). Many of the TAM research studies use different methodological and measurement factors which produce conflicting and inconclusive findings with a wide variations in results (Ma & Liu, 2004; Yousafzai, Foxall, & Pallister, 2007). However, varied and

disparate research findings are not uncommon in Social Science as assessing human behaviour is both difficult and complex (Michotte, 1963) whilst mixed findings undermine the precision of any results obtained. The variation in research findings do however further complicate the understanding of consumer mobile payment behavioural intention, acceptance and adoption as mobile payments are based upon technology (Lee, Cho, Gay, Davidson & Ingraffea, 2003; Ma & Liu, 2004).

A review of existing literature by Slade et al. (2014) identifies that 25 quantitative studies have assessed factors affecting consumer mobile payment adoption behaviour whilst over 50% of these have used a derivative of TAM as the theoretical base. As mobile payments is a relatively new phenomenon the majority of the research assesses behavioural intention as the substitute for adoption and usage which is consistent with this research approach (Hu, Chau, Sheng, & Tam, 1999). However, Arvidsson (2014) suggests that innovative studies of the payments sector cannot rely on TAM and DoI theories on their own as other theories need to be considered including consumer learning, network economies and value-creation so that a comprehensive understanding is obtained of consumer perspectives related to new payment instruments. In addition, there is no consistent choice of external stimulus criteria used in TAM as antecedents to a consumer's cognitive response related to perceived ease of use and perceived usefulness according to Legris et al. (2003). However, there is consistency in perceived ease of use as an antecedent of perceived usefulness as well as perceived usefulness and perceived ease of use as an antecedent of a consumer's affective response of attitude with mobile technology.

As identified above, the TAM is a suitable framework model for exploring consumer acceptance of mobile payments (Shin, 2009), although additional constructs of risk and trust need to be incorporated into the TAM framework to better understand consumer intentions. Adding these additional risk and trust constructs into the TAM has been successfully achieved by Featherman and Pavlou (2003); Gefen (2004); Gefen et al. (2003b); and Pavlou (2003). As a result of the above, the use of the TAM framework that underpins the conceptual model that is used in this research fully supports the research objectives.

1.6 Importance of the research

Various aspects of mobile payment adoption research have been undertaken based upon a mobile phone handset as the consumer enabler in a number of countries outside the UK including Canada (Canadian Imperial Bank of Commerce, 2014); China (Chong, Chan & Ooi, 2012; Laforet & Li, 2005); Japan (Amoroso & Magnier-Watanabe, 2012; Bradford & Hayashi, 2007; Wall Street Journal, 2011); Malaysia (Chong et al., 2012; Osman et al., 2011); South Korea (Bradford & Hayashi, 2007; Lee, Lee & Kim, 2007; Shin, 2009; Yang, 2005); and USA (Bradford & Hayashi, 2007; Ching & Hayashi, 2010). However, whilst previous research has been undertaken on exploring consumer cultural perspectives of mobile payments this has been predominantly in the Asian and Nordic regions whereas this research explores UK cultural perspectives of the phenomenon and provides theoretical and practical contributions using a human psychology framework.

From a theoretical perspective, this research fills an important gap in literature as it provides empirical evidence of UK consumer perceptions of the mobile payments phenomenon that includes the identification of barriers to adoption as well as the benefits of adoption that meet a consumer payment need in specific situations (Meuter et al., 2000; Riggins et al., 1994). In addition, this research also fills an important gap in literature by providing empirical evidence of UK consumer perceptions of information technology as consumer based technology devices have become an integral part of, and embedded in today's society (Drucker, 2011) including smart phones (IDC, 2015; Ling, 2004) and other devices such as tablet computers, watches and glasses (Apple, 2014a; Google, 2014; Little, 2011; Samsung, 2014; Swatch, 2015).

This research also contributes to theory development through the creation of new research findings related to consumer behaviour and payment instrument choice. Furthermore, this research adds to the body of knowledge on UK consumer acceptance criteria for mobile payments in specific market sectors where the benefits of adoption can be easily identified and understood which then supports wider adoption in other market sectors (van Hove, 2004).

Existing literature on mobile payments indicates how consumers experience and understand the phenomenon within the social context of a mobile phone (Antovski & Gusev, 2003; Lee, Kou, & Hu, 2005; van der Kar & van der Duin, 2004; Wessels & Drennan, 2010). This research helps to fill an important gap in current literature as it provides empirical evidence of UK consumer perceptions of mobile payments that extends the historical perspective of mobile payments (Kreyer, Pousttchi, & Turowski, 2003; Teo, Fraunholz & Unnithan, 2005; Zmijewska, 2005) into other consumer self-service technology mobile devices including smart phones and EMV contactless cards.

This research also contributes to theory development through a conceptual model that is based upon the core constructs of TAM and extended to explore consumer perceptions of mobile payments which is a technology based service (Adams et al., 1992; Chin & Todd, 1995; Doll, Hendrickson & Deng, 1998; Segars & Grover, 1993). In addition, this research also contributes to theory development as it uses sequential mixed methods research with an empirical methodology using a questionnaire as the 1st research instrument that produces quantitative data which is followed by semi-structured interviews which produce qualitative data. The use of multiple research methods produce rich and intricate data that may not have been obtained from the use of a single research instrument (Bryman, 1992; Hussey & Hussey, 1997).

1.7 Overview of the thesis

This chapter introduced the research that explores UK consumer perceptions of mobile payments and establishes the research problem within the existing empirical context and indicates the conceptual framework on which this research is based. The thesis structure has four sections and the thesis outline structure is provided in Figure 1 - Thesis Structure Overview below:

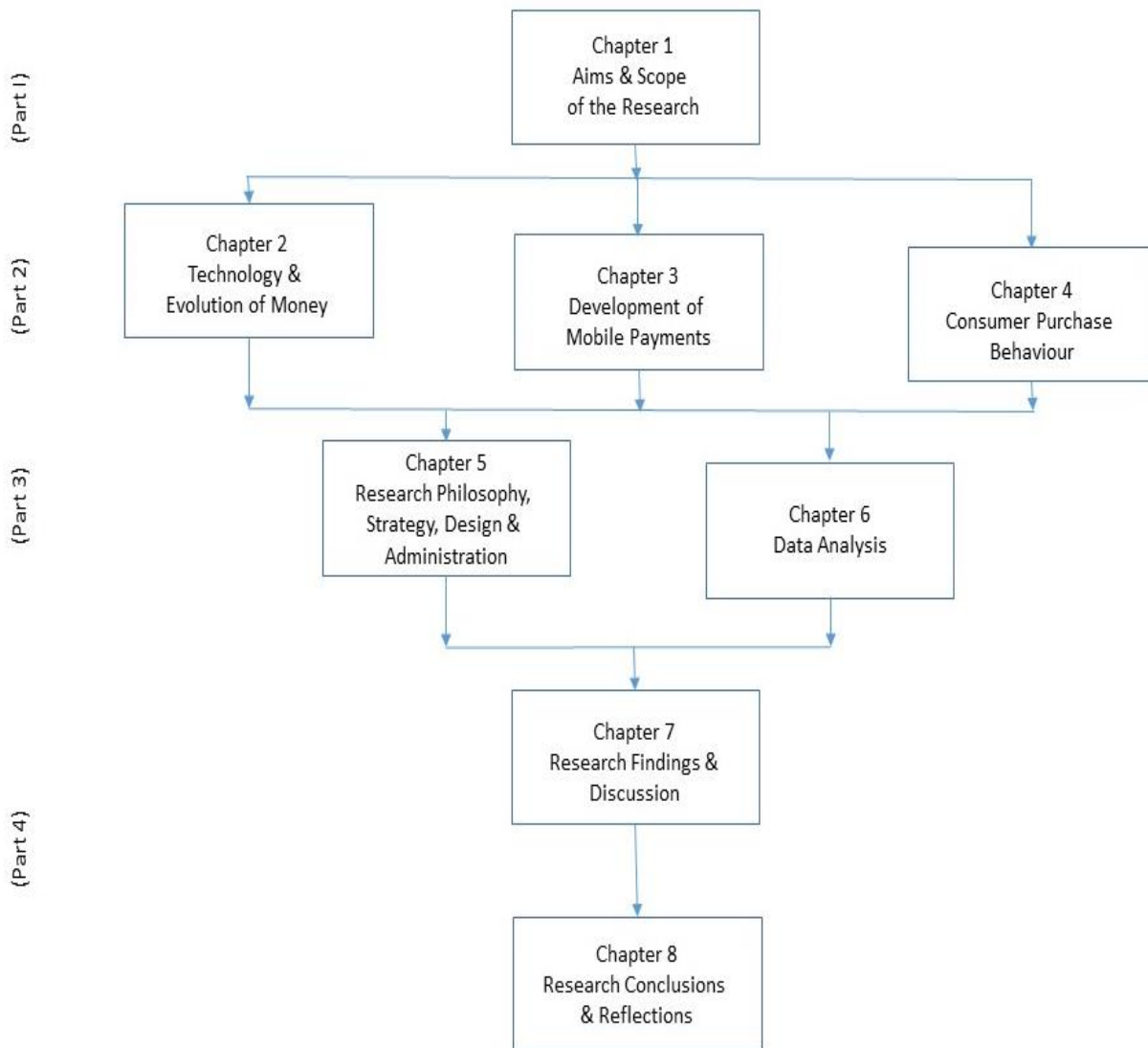


Figure 1 - Thesis Structure Overview

Chapter 2 sets this research within the broad context of the evolution of money including the history and development of money as a financial exchange mechanism. The chapter goes on to review the technology impact on Society before narrowing the research focus down to technology enabled services and the impact on consumers.

Chapter 3 further refines this research by initially exploring the various academic and regulatory definitions of mobile payments before undertaking a review of mobile payment developments that establishes the historical context of this new phenomenon.

Chapter 4 then refines this research with a focus on consumer purchase behaviour. Consumer behaviour is initially explored and is followed by a review of consumer perceptions before the research lens is focussed on consumer perceptions of payment instruments. This is followed by a review of consumer perceptions of perceived usefulness and perceived ease of use, consumer perceptions of trust and consumer perceptions of risk. The chapter concludes with a review of research models before defining and justifying the conceptual model that is used for this research and identifying the various research propositions that are explored.

Chapter 5 identifies and justifies the use of a post-positivist research philosophy and a social constructionist ontology with an inductive approach on which this research is based before going on to identify and justify the research strategy which uses sequential mixed methods. The chapter then identifies and justifies the research design and research administration which is based upon two different types of consumer survey instruments with a questionnaire used first and then followed by semi-structured interviews. The chapter then explains and justifies the research procedures used, the data analysis, data validity and reliability of this research and concludes with a review of research ethics that apply and are used.

Chapter 6 reviews and explains the numerical data analysis that is undertaken on the quantitative data obtained from the questionnaires and the narrative data analysis that is undertaken on the qualitative data obtained from the interviews.

Chapter 7 identifies the key research findings that arise from the data analysis and are reviewed within each of the research propositions whilst the research findings that are identified are placed within the context of existing mobile payments knowledge.

Chapter 8 reviews the research conclusions and explains how the research statement and research objectives identified earlier are met before identifying the empirical and theoretical contribution to knowledge that this research provides. A critical evaluation is then undertaken of the research model, the research methodology and research methods that are used in this research. Future research opportunities are then identified before the chapter concludes with a critical reflection of this research.

1.8 Summary

This chapter introduced this research that explores UK consumer perceptions of mobile payments which is a relatively new phenomenon. The chapter went on to identify the research problem and framed the research aims and objectives within the existing knowledge before describing and justifying the conceptual framework on which this research is based. The chapter concluded by identifying the importance of this research for both academics and practitioners through the identification of gaps in existing literature on consumer purchase behaviour based upon consumer enabled technology devices. Understanding the different influences on consumer payment behaviour with the expanding range of consumer enabled technology devices that support mobile payments is important for successful adoption.

The next chapter reviews contemporary literature related to the development of money which is used as a means of exchanging value. The development of the various payment mechanisms from the Stone Age through to the Information Age is then identified as this led to the development and adoption of what is known as money in today's society. Financial exchange as a payment method is then reviewed from the original barter system through to the use of notes and coins and subsequently into electronic payments following developments in computer technology. Contemporary literature on the technology impact on society is then reviewed which suggests that information technology adoption is a vital feature underpinning an information and knowledge based society (David & Foray, 2002). Consumer technology purchase behaviour is then reviewed which identifies that consumer adoption of technology enabled services is influenced by an individual consumer's self-efficacy as this affects consumer attitude towards information systems such as mobile payments (Lu, Yao & Yu, 2005).

2 Technology and the Evolution of Money

2.1 Introduction

In the previous chapter an introduction to this research was provided which explores UK consumer perceptions of mobile payments that is a new electronic consumer payment phenomenon. The research aims and objectives were then described and contextualised within the existing body of knowledge before going on to define the conceptual framework on which this thesis is based. The final section of the previous chapter identified the different contributions to knowledge that this research makes before explaining the chapter structure of this thesis.

There are 3 literature review chapters and the 1st chapter reviews literature relating to technology and the evolution of money within society before the next chapter narrows the research lens with a review of the development of mobile payments. The final literature chapter narrows the research lens further with a review of consumer purchase behaviour with technology as shown in Figure 2 - Structure of Literature Chapters below:

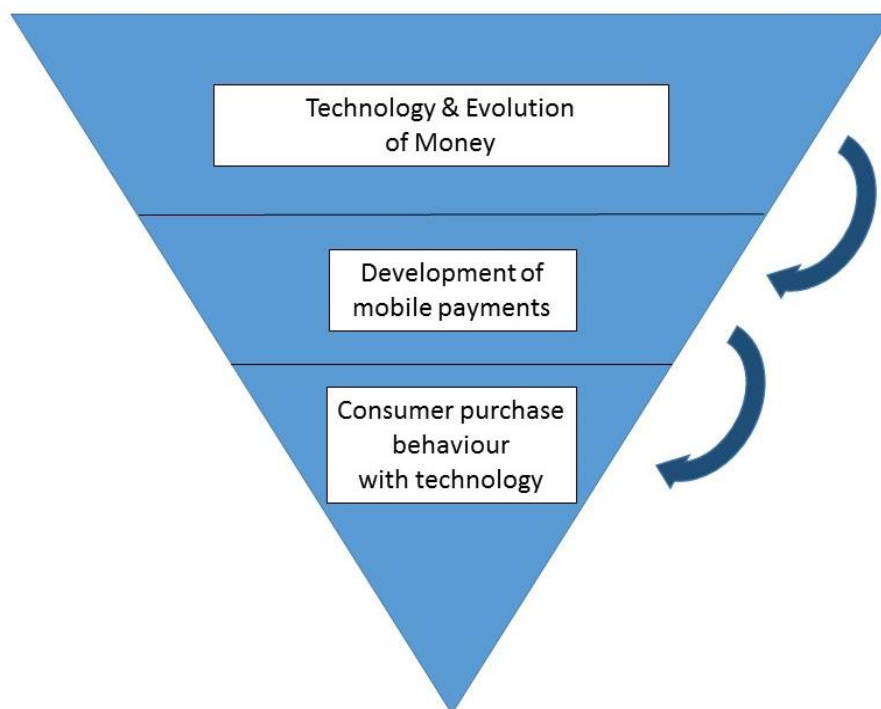


Figure 2 - Structure of Literature Chapters

Developed by C C Hampshire (2015)

The 1st section of this chapter commences with a review of the history and development of money which is used as a means of exchanging value. The financial exchange is reviewed as a payment method that commenced with the original barter system and extended to the use of notes and coins and subsequently into electronic payments through the use of computer technology. The research lens is then narrowed to the technology impact on society in the 2nd section of this chapter that suggests that information technology adoption is a vital feature underpinning an information and knowledge based society (David & Foray, 2002). The research lens then narrows further still in the 3rd section and provides a review of consumer technology purchase behaviour which identifies that consumer adoption of technology enabled services is influenced by personal capacity or self-efficacy as this affects consumer attitude towards information systems such as mobile payments (Lu, Yao & Yu, 2005). Furthermore, consumer perception of security and risk are part of the consumer decision making process that is used to explore the relative advantages of technology enabled service adoption (Walker & Johnson, 2006). The key theoretical positions that this research adopts for each of the three sections of this chapter are shown in Figure 3 - Technology and the Evolution of Money Chapter Structure below:

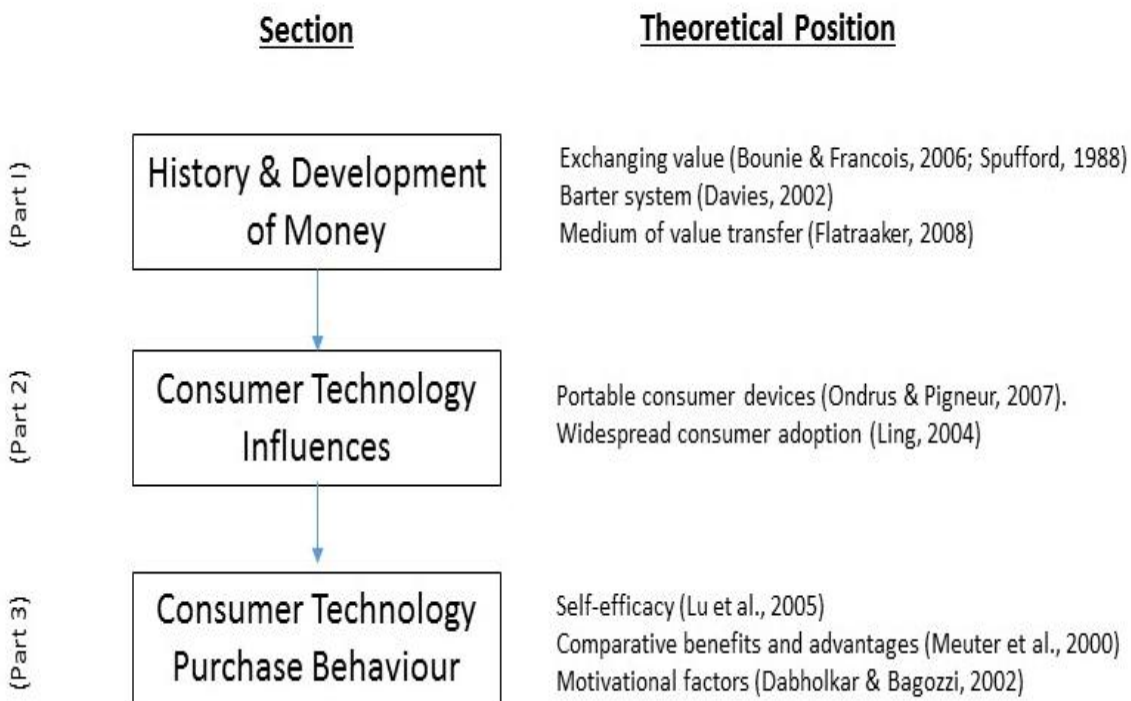


Figure 3 - Technology and the Evolution of Money Chapter Structure

This chapter reviews the contemporary literature that relates to the development of money in today's society which is widely used as a means of exchanging value (Bounie & Francois, 2006; Spufford, 1988). The use of payment technology within society is then reviewed and how this leads to the development of various payment mechanisms through to the Information Age and into the development of what is known as money in today's society. This chapter also reviews how financial exchange is used as a payment method from the original barter system based upon commodities leading to the use of notes and coins as a more efficient value exchange and subsequently develops into electronic payments through the use of computer technology. This chapter then goes on to review how the communications technology evolution led to the development of mobile payments which extends electronic payments into consumers transferring financial value remotely using a variety of portable consumer wireless devices including contactless smart cards and mobile phones (Diniz et al., 2011; Ondrus & Pigneur, 2007).

Contemporary literature on the technology impact on consumers is then reviewed and includes the effect of payment technology on consumers and society. This is followed by a review of consumer interest in technology enabled payment services including various aspects of consumer perceptions of mobile payments. The various influences that affect consumer behaviour with the different consumer enabled technology devices are then explored.

2.2 History and Development of Money

Advances in knowledge, skills and technology are part of human history with stone tools being the first recognised technology from the Stone Age (Bunch & Helleman, 1993) although it is likely that wooden tools preceded stone by millions of years, but as wood survives only in exceptional circumstances this is difficult to validate. Studying the key phases of human development from the Stone Age to the current period helps provide a clearer understanding of how society got to where it is today, as this then supports predictions on the future evolution of Society (Fitzgerald, 2002).

Six key phases of human development are identified by Fitzgerald (2002) which commences with the Stone Age when humans used technology skills to make and use

tools from their natural environment and these formed the first phase of manufacture as we know it in today's society (Netzley, 1997). Following the Stone Age was the Agricultural Age where the technological developments continued with the plough and other technological artefacts that have been found including pottery, written language and the development of trade which was originally based upon a local barter payment system where goods were exchanged on a local basis. This local barter system was the only means of payment throughout the greater part of society's evolution until the development and acceptance of money according to Davies (2002).

The Industrial Revolution followed the Agricultural Age and resulted in the creation of the factory based economy with payment for goods and services through coins which replaced the local barter system. These early coins became known as money and were accepted as value by the provider of the goods or services (Innes, 1913). The coins are tokens with a standardised value that is used for exchanging payment between the recipient of the goods or service to the provider (Einzig, 1966; Ferguson, 2008). However, Davies (2002) suggests a much wider definition for money that includes anything widely used for making payments which then includes barter exchange payments where any payment item could have a large differing value and hence money with a standardised value of exchange became a widely accepted form of payment (Ingham, 2004).

The use of money began in the sixth century B.C. according to Velde (1998) in what is now western Turkey, when lumps of gold found in rivers were melted and turned into pieces of uniform size imprinted with a stamp although Khan and Craig-Lees (2009) suggest that the use of token based money has been a facet of societies for many years. Whatever date money was first introduced and used in society, this commodity or token (typically a metal with some intrinsic value) became the widely accepted medium of exchange and is in widespread use in today's societies (Spufford, 1988).

The Electricity Age followed the Industrial Revolution and led to major advances in transportation that form the basis of society we know today. As a result, the use of coins became supplemented with the development and use of bank notes as a form of money which also became an accepted form of exchange for goods and services

alongside coins (Davies, 2002). On a similar basis to coins, each bank note had a specific recognised value and this token was accepted as the exchange value of the note by both consumers and providers of the goods and services. These bank notes became accepted as payment for goods and services in the same way that coins were accepted although bank notes are much easier to carry and conceal compared to the coin predecessor. However, bank notes only became a viable financial exchange mechanism when the various disparate parties involved in each value exchange actually accepted bank notes as a payment mechanism.

The definition and boundaries of the term money cannot be specified precisely and as a result the literature relating to the concept of money is vast and complex (Snelders, Lea, Webley & Hussein, 1992). However, the use of money is based upon the concept that it is a medium of exchange with a specific measure or value and is a means of storing and transporting abstract value (Flatraaker, 2008; Grierson, 1977; Keynes, 1930). The abstract value of exchange arises predominantly from the development and acceptance of bank notes, although the value of the actual metal content of coins had substantially diminished when bank notes became accepted (Davies, 2002) and as a result later coins are the first example of abstract value payment tokens.

Money is far superior to barter as a medium of exchange between two parties as barter requires an improbable coincidence of wants and situations with the balancing of the value exchange which restricts trade to those who know one another but also restricts it to those individuals who wish to exchange products or services for the same approximate value (Khan & Craig-Lees, 2009). The development of money provided the foundation upon which the burden of trust is removed from each of the participants in the transaction with trust transferred to the token exchange which was initially based upon the intrinsic value of the metal contained within the coins but subsequently moved to the form of a transferable token e.g. coins and bank notes. The adoption of coins and notes, which are a store of value within a conveniently portable medium of exchange, became a widely accepted means of exchange of value in today's society (Ingham, 2004).

The Space Age led to a number of society-benefitting developments including early computer technology which supported the evolution of electronic banking and payments that are electronic messages used to transfer financial value from one party to another rather than a physical exchange of bank notes or coins (Furst et al., 1998). Electronic payments are now an integral part of modern society and a part of everyday life, such that they are indistinguishable from it (Weiser, 1991) as electronic payments are an everyday experience for all consumers (Bounie & Francois, 2006), except primitive Societies.

The Information age followed the Space Age and brought about many key developments in transmission, storage, display and control of information along with improvements in other areas including manufacturing, communications and transportation. The communications evolution provided the foundation for the development of mobile payments as it extended electronic payments into transferring financial value remotely using portable consumer devices that include mobile phones and contactless smart cards (Ondrus & Pigneur, 2007). However, world-wide adoption of mobile payments may not occur as quickly as may be expected as the British public remain firmly attached to paying for goods and services using the traditional methods of coins and bank notes (Davies, 2002). Furthermore, motivating consumers to amend their payment habits to adopt this new payment capability is critical to successful adoption as consumers are reticent to change their payment habits without the right incentives (Ho & Ko, 2008; Riggins et al., 1994) whilst consumer apathy also has to be overcome (Viehland & Leong, 2007). However, Davies (2002) suggests that affluent countries will adopt non-cash electronic payments as they have access to payment mechanisms that use technology that poor countries cannot afford, although the widespread adoption of M-PESA mobile payments in various African countries does not substantiate this (BBC News, 2010; Perlman, 2010).

An Information Technology society can be traced back to the beginnings of mankind according to Sadleir (1991) although this is based upon a very broad definition of technology. It is technology in its broadest form and not just computer hardware, software and the internet that has shaped today's society and the consumer world that we live in today (Abbott, 2003). The cumulative effect of information technology has

decreased the timescales in which to undertake an analysis, make a choice and reach a decision (Sadleir, 1991). Consumers with advanced problem solving and critical thinking skills may have a substantial advantage in a technology driven society (Fitzgerald, 2002) whilst these consumer traits may be an influence on mobile payment adoption. As a result, those consumers in countries with no access to these information technology developments may be considerably disadvantaged compared to their counterparts in developed countries where information technology is an integral part of society (Mansell, 1999). However, these disadvantages may also apply to specific sections of society in developed countries where limited access to these technology developments is available (Forestier, Grace & Kenny, 2002).

Despite the disadvantages identified above, the benefits of technology developments in internet banking and electronic payments include cost savings along with more efficient use of resources (Humphrey, Kim & Vale, 2001; Sohail & Shanmugham, 2003). Previous research identifies that when a payment is made by credit card the purchase value per transaction increases (Feinberg 1986; Hirschman, 1979) but whether this was due to absence of cash or mobility factors that influence point of purchase behaviour has not been determined. Moreover, easier and more convenient consumer payment methods can lead to over-consumption which can have an adverse impact in developed societies using valuable resources that are not really required by consumers that could otherwise be used more productively for the wider benefit of society (McDonald, Oates, Young & Hwang, 2006; Nocera, 1994; Taylor & Tilford, 2000; Zavestoski, 2002).

2.3 Consumer Technology Influences

Technology and society exist in a collaborative relationship that produces a cyclical co-dependence, co-influence and co-production (McGinn, 1991). The Information Age occurred due to the development of new information and communication technologies (Castells, 2000) although technology assessment and foresight is a highly complex activity (Ondrus & Pigneur, 2005). Information Technology adoption is an important aspect of any society's development and societies in developed countries may have an advantage where information technology is more affordable which may be at the expense of developing countries where information technology is a relatively

expensive commodity (Zakour, 2004). Information and knowledge in a modern society play an increasingly important role as they help to determine society's direction in a knowledge economy (Namani & Pantina, 2009). In addition, society is increasingly influenced by the role and importance of information, whilst information technology adoption is a vital feature underpinning an information and knowledge based society (David & Foray, 2002). Technology helped to shape the Industrial society and the Information society and will increasingly help to shape future society according to Linstone (2011). However, whilst technology has played a central part in society evolution, technology is not the only factor as it is consumers who actually determine whether to adopt technology such as mobile payments.

The ability of a society to master evolving technologies and transform itself can be an important evolutionary step, although technology is not responsible for the change in society as it only provides a foundation on which a change in society can occur (Jasanoff, 2004). Furthermore, a technical deterministic approach suggests technology forms and moulds society whilst a social deterministic approach suggests that technology is continually re-interpreted and given new and often unexpected trajectories (Bijker & Law, 1992). The evolution of mobile payments from the initial mobile phones to smart phones, contactless cards and other consumer oriented devices is one example of a new trajectory that applies to consumer payments. The effects that arise from technological determination and social determination cannot be differentiated as both technology and society help to shape each other through the evolutionary interaction process (Jasanoff, 2004; MacKenzie & Wajcman, 1999) although social determination of technology makes more sense and is a broadly accepted position compared to the technological determination (MacKenzie & Wajcman, 1999). However, whilst technology has substantially improved lives through many innovations that arise from a response to a society's changing needs (Namani, Pantina & Shaqiri, 2010), a number of economic and social paradoxes have been created that increasingly challenge people in their individual and social lives (Easterbrook, 2003).

Mobile phone technology has become reliable and easily accessible which has resulted in widespread consumer adoption and is becoming an integral part of today's society

in many countries (Ling, 2004). In addition, the continued development of both information and communication technologies have had a major impact on social attitudes and social inclusion with improved and increased availability of information technology and information (Warschauer, 2003). The increased access to information covering specific products, services or organisations supports more informed decisions together with the ability to distribute information quickly, efficiently and cheaply (Walker & Johnson, 2006).

2.4 Consumer Technology Purchase Behaviour

Mobile payments is a technology-enabled service that requires the use of a portable consumer technology device to initiate a financial exchange between two parties but technology enabled services are not neutral in their impact and have both physical and mental side effects although technology enabled services can assist, as much as distract consumers (Norman, 1993). As identified earlier, technology enabled services can be socially divisive as developed societies, and those consumers within these societies, can more readily understand and afford the latest technology enabled services and information systems (Miles, 2006).

The willingness of consumers to adopt technology enabled services is influenced by each consumer's personal capacity or self-efficacy which affects consumer attitude towards information systems such as mobile payments (Lu, Yao & Yu, 2005). Furthermore, consumer perception of security, risk and the technical reliability of the various information systems are part of the consumer decision making process that is used to explore the relative advantages of technology enabled service adoption (Walker & Johnson, 2006). However, Davis (1993) suggests that consumer interest in technology enabled services is influenced by the perception of the availability and ease of use whilst perceived usefulness is substantially more influential in determining usage than perceived ease of use. The significant influence of perceived usefulness of mobile payments on consumer attitude highlights the importance of ensuring the functional capabilities meet a consumer need whilst simultaneously ensuring that these capabilities, and their benefits, are fully understood.

In contrast, De Ruyter, Wetzels and Kleijnen (2000) suggest that consumer interest in technology adoption such as mobile payments is determined by the concerns and perceived risks whilst organisational reputation, relative advantage, and perceived risk have a substantial effect on consumer attitude and subsequent behaviour although relative advantage has a minimal impact on trust. However, Meuter et al. (2000) suggest that consumer interest in technology enabled services is determined by consumer understanding of comparative benefits and advantages which is similar to perceived usefulness. Furthermore, consumer interest in technology enabled services is also influenced by the degree of personal contact required by a consumer which is determined by motivational factors (Dabholkar & Bagozzi, 2002). In addition, consumers already using a technology enabled service have more confidence that the underlying information system is reliable and secure (Rotchanakitumnuai & Speece, 2003). However, regular consumer use of technology enabled services does not guarantee that a consumer is satisfied with the service provided according to Walker and Johnson (2005).

A considerable amount of academic research exists on consumer acceptance and adoption of mobile payments with a predominant focus on a mobile phone as the consumer device that is used to make the financial exchange (Antovski & Gusev, 2003; Kousaridas, Parissis & Apostolopoulos, 2008; Kreyer et al., 2003; Lee et al., 2005; Teo et al., 2005; van der Kar & van der Duin, 2004; Wessels & Drennan, 2010; Zmijewska, 2005). However, the subsequent development of smart phones require a consumer to install and use an electronic wallet that also requires navigation to the payment screen to facilitate a mobile payment (SamsungPay, 2015b). These additional consumer activities together with smart phone applications and services that are complex (Chang, Chen & Zhou, 2009) discourage consumers from mobile payment adoption where complexity is defined as “the degree to which an innovation is perceived as difficult to understand and use” (Rogers, 1995, p. 16).

As identified above, widespread UK consumer adoption of mobile payments is dependent upon a financial exchange service that offers consumer access to a secure mobile payment system that is convenient, simple to use but as importantly meets a specific consumer need that can be easily identified and recognised.

2.5 Summary

This chapter reviewed how a financial exchange mechanism commenced with the barter system based upon commodities and how this led to the development of notes and coins as a more efficient value exchange payment system (Bounie & Francois, 2006; Spufford, 1988). The development of electronic payments was then reviewed including the communications technology evolution that provided the framework for mobile payments that support the transfer of a financial value using a variety of portable consumer wireless devices (Ondrus & Pigneur, 2007). Widespread adoption of electronic payments by UK consumers independent of age, gender and educational qualifications together with widespread adoption of smart phones and other electronic consumer devices (IDC, 2015; Ling, 2004) provides a firm foundation base for the adoption of mobile payments by UK consumers.

Contemporary literature on technology impact on Society was then reviewed before the chapter went on to review consumer attitude towards technology enabled services which identified that consumer benefits can offset perceived risk and are a positive influence on consumer attitude (Hayashi, 2012; Kim et al., 2010). This chapter then reviewed consumer perception of security, risk and trust that are key influences in human decision making process and went on to identify that these concerns can be mitigated by organisational reputation (Meuter et al., 2000; Walker & Johnson, 2006). Perceived usefulness and perceived ease of use were then reviewed and perceived usefulness is identified as substantially more influential in determining consumer adoption of technology enabled services (Davis, 1993).

The next chapter commences with a review of the broad range of mobile payment definitions in contemporary literature as some mobile payment definitions are included under mobile commerce and mobile banking (Jacob, 2007) although the European Payments Council (2012) mobile payment definition is broad enough in scope to cover the latest payment instrument developments that include contactless cards, smart phones and other consumer portable devices. The chapter goes on to review the evolution of mobile payments that includes contactless payments that extend the range of consumer mobile payment instruments including smart phones

that are complex devices compared to contactless cards that are simple consumer mobile payment devices (Chang et al., 2009). The complex dynamics of mobile phone payment service provision covering the MNO, financial institutions and other organisations is then reviewed.

3 Development of Mobile Payments

3.1 Introduction

In the previous chapter the development of technology that supports various payment instruments was reviewed including what is known as money in today's society. The chapter then went on to discuss the various financial exchange mechanisms that are used as payment methods including the original barter system that was based upon commodities and then notes and coins that are a more efficient value exchange system (Bounie & Francois, 2006; Spufford, 1988). The development and wide-spread adoption of electronic payments was then discussed before contemporary literature on the technology impact on Society was reviewed. Consumer attitude towards technology enabled services was then explored which suggests that consumer benefits that offset risks have a positive influence on consumer attitude (Hayashi, 2012; Kim et al., 2010).

The first section of this chapter reviews the various definitions of mobile payments that identifies a number of mobile payment definitions are included under mobile commerce and mobile banking (Jacob, 2007). The chapter identifies that the European Payments Council (2012) definition for mobile payments is broad enough in scope to cover the latest payment instrument developments that include contactless payments through cards and other consumer devices.

The 2nd section of this chapter goes on to review the evolution of mobile payments including the more recent technology development of contactless payments that extend the range of consumer mobile payment instruments including smart phones and watches (Apple, 2015, Samsung 2015, Swatch, 2015). This chapter then identifies that mobile payments is a complex evolving phenomenon and smart phones are complex devices (Chang et al., 2009) whereas contactless cards are simple consumer mobile payment devices. The complex dynamics of mobile phone payment service provision covering the MNO, financial institutions and other organisations are then reviewed which suggests that UK consumers trust banks compared to other mobile payment organisations (Bizrate Insights, 2014; Waris et al., 2006). The different mobile payment developments in the various markets and societies around the world are then

reviewed. The key theoretical positions that this research takes for each of the two sections of this chapter and the key theories for each are shown in Figure 4 - Development of Mobile Payments Chapter Structure below:

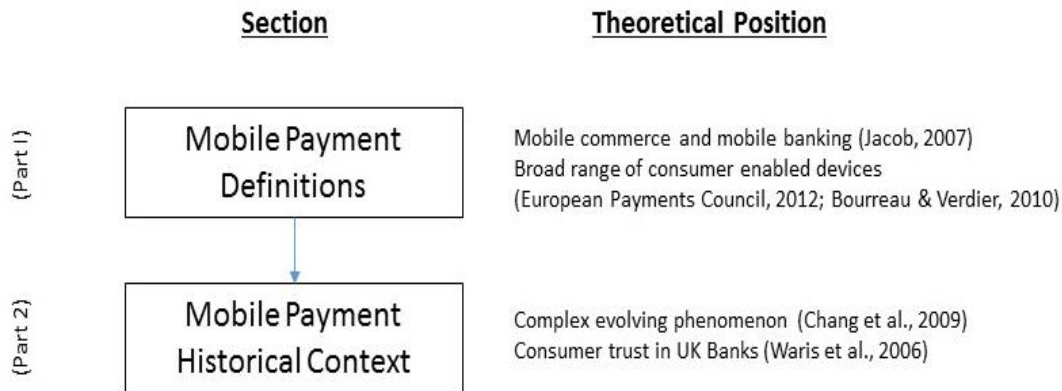


Figure 4 - Development of Mobile Payments Chapter Structure

The evolving mobile payment phenomenon is contextualised from existing literature along with the expanding types of consumer held mobile devices as shown in Figure 5- Mobile Payment Framework below:

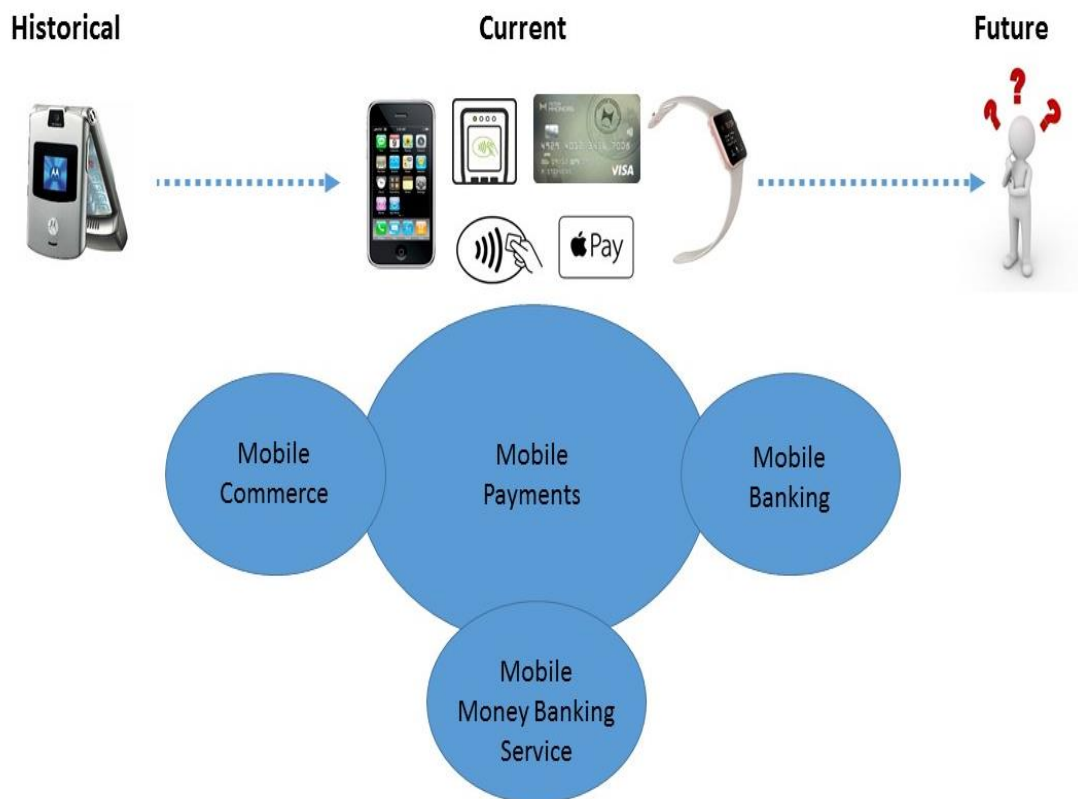


Figure 5 - Mobile Payment Framework
Developed by C C Hampshire (2015)

The chapter goes on to identify that even with advanced infrastructures and sophisticated technology networks, widespread adoption is dependent upon consumer readiness which is a critical success factor (MasterCard, 2012a). The chapter identifies that a number of UK consumers are now adopting mobile payments through EMV contactless cards with initial predominant usage in the transport market independent of age, gender or educational qualifications (TfL, 2015; UK Cards Association, 2015a). The chapter concludes with a summary of the key points identified in this chapter before going on to explain the structure of the next chapter.

3.2 Mobile Payment Definitions

Mobile payment is a new form of electronic payment (Viehland & Leong, 2007) and is a popular recent academic research topic (Diniz et al., 2011). However, there is no consensus on the definition of mobile payments with a very broad range of criteria being used within academic literature that encompasses the term mobile payment (also known as m-payment) which has resulted in considerable inconsistency in the terminology used as well as the meaning of that terminology. This inconsistency is demonstrated by Karnouskos and Fokus (2004) who suggest that the terms mobile banking and mobile payment are interchangeable descriptions, although other academic literature on mobile banking does not include any aspect related to mobile payments. Mobile banking can be regarded as a much broader subject area than mobile payments as it includes many banking related functions with no relevance to mobile payments although Skeldon (2010) suggests that mobile banking is also a nebulous term that covers various aspects of mobile and banking in their own right. In addition, Ngugi, Pelowski and Ogembo (2010) use the term mobile money banking service which they suggest is an evolving technology for the transfer of financial value although no other mobile payment academic literature has been found that uses this term.

A wider definition of mobile payment is suggested by Keramati, Taeb, Larijani and Mojir (2011) who adopt and extend a definition from Lee and Benbasat (2004) that suggests mobile payment is part of mobile commerce which depends upon effective payment solutions provided by mobile payments. Whilst a mobile payment can support a mobile

commerce transaction there are other forms of electronic payment that exist for mobile commerce consumers to pay for their goods and services (Chou, Lee & Chung, 2004). However, Jacob (2007) links mobile payments with mobile commerce by suggesting that mobile commerce is made up of two subsets which are mobile payments and mobile banking.

Meanwhile, Zhong (2009, p.80) defines mobile payment as a new and alternative payment method requiring a mobile device to “initiate, authorize and/or confirm an exchange of financial value” for payment of goods and services that can replace payments made with cash, cheque or credit cards. Whilst this mobile payment definition includes a number of operational aspects including initiate and authorise that are part of the overall payment process making a mobile payment is about the exchange of value. In addition, Karnouskos and Vilmos (2004) suggest that mobile payments do not restrict themselves to payments via mobile phone but can be made with virtually any mobile device such as smart phone or tablet computer, although the examples provided are all physical devices that include a large degree of information technology along with a consumer enabled screen. Despite the physical device examples provided, the mobile payment definition suggested by Karnouskos and Vilmos also encompasses a payment made with a contactless EMV smart card which can be regarded as a mobile device in this context. The mobile payment definition provided by Zhong (2009) and Karnouskos and Vilmos (2004) is consistent with that provided by Bourreau and Verdier (2010) who suggest that a mobile payment can be made using any instrument carried by the consumer that has the relevant technology to transfer financial value between 2 parties which would include contactless EMV smart cards.

An alternative definition of mobile payment is provided by Turowski and Pousttchi (2004) who suggest that this is an electronic payment transaction procedure that uses mobile communication techniques in conjunction with mobile devices to effect a payment. Both Turowski and Pousttchi (2004) and Zong (2009) suggest that a mobile payment includes an initiate and authorise phase. However only Zong’s mobile payment definition includes confirmation of the financial value exchange although

Turowski and Pousttchi (2004) refer to the financial exchange as payment realization which may include funds transfer between the consumer and the provider of the goods or services and would include contactless EMV smart card payments.

Whilst a number of the mobile payment definitions are based upon a mobile phone handset which then exclude mobile payments made with other devices including smart cards, there are a few mobile payment definitions that are not as specific with the definition of a mobile device. However, Khan and Craig-Lees (2009) suggest that there are two forms of mobile payments available: the mobile payment smart card and a mobile wallet. A mobile payment smart card supports a purchase through the provision of electronic messages that are generated when a consumer makes a payment (Dahlberg, Mallat, Ondrus & Zmijewska, 2006). A mobile wallet is, in essence, a smart card application that is stored in a mobile device's microchip that acts as a payment instrument from which a consumer can make a payment (Flatraaker, 2008) which is generally consistent with the mobile wallet definition by the European Payments Council (2014a). A variety of mobile payment definitions include the type of device used, the scope of the payment transaction and whether mobile payment is a part of mobile banking and mobile commerce which has resulted in some confusion with the mobile payment term although it is used regularly without any reference to a defined meaning (Diniz et al., 2011). Despite the wide range of mobile payment definitions the one consistent aspect is that a mobile payment is a relatively new concept that has been in existence and continually developing for just over 10 years and involves some form of financial exchange between two parties on the instructions of a consumer in a wireless environment.

Both the European Commission and European Payments Council broadly classify mobile payments as contactless payments although similar terms like proximity or remote payments are also used (European Commission, 2012; European Payments Council, 2012). The rapid proliferation of smart phones (IDC, 2015) with the option of installing sophisticated mobile payment applications (Apps) has fuelled a large increase in mobile payment systems according to the European Payments Council (2014b). The Information Technology and Innovative Foundation (2009) and Mobey Forum (2011) state that mobile payments entail a complex, system-interdependent ecosystem with

many players. As a result, one of the success criteria for widespread adoption of mobile payments is that all participants act collaboratively in the ecosystem simultaneously. However, in the developed western countries this is something that the market participants are not very good at according to the European Payments Council (2012). Petrauskas and Zumaras (2008) suggest that there will be an increasing use of mobile payments once an improved regulatory framework has been created within the European Union. Although as with any new technology, unless a specific consumer need is identified or generated, consumers are unlikely to change their present familiar ways of making a payment using cash, card, cheque or other existing electronic payment methods (Sathye, 1999). Widespread adoption of mobile payments is dependent upon the identification or generation of a consumer need that can be satisfied as this then replaces a consumer's existing and established method of payment for the purchase of goods and services and overcomes apathy (Viehland & Leong, 2007).

3.3 Mobile Payments Historical Context

As identified earlier a number of well-established and world-leading companies have developed and launched various forms of mobile payments over the last couple of years including American Express, Apple, Banco Santander, Barclaycard, Google, La Caixa, MasterCard, PayPal, VISA and VocaLink. Apple Inc. is one of the latest companies to enter the mobile payments world with the launch of their iPhone 6 handset and their proprietary Apple Pay service (Apple, 2015) whilst Microsoft (2015) have indicated their entry into mobile payments with their smart phone handsets. However, the current market focus for companies providing mobile payments is to establish the complex integrated requirements to support this evolving phenomenon through a mobile phone handset and the MNO's service (Finextra, 2012a; Swatch, 2015) or based upon an extended EMV smart card for contactless card payments (Barclaycard, 2009; Finextra, 2010; HSBC, 2012; Lloyds TSB, 2011; Post Office, 2012). The provision of mobile payments entails a complex environment with varied stakeholders involved in providing this payment capability and covers information technology, application

systems, technology infrastructure, merchants (retailers), point-of-sale terminals and technology communications (Rochet & Tirole, 2002; Swatch, 2015).

Considerable research has been undertaken over the last decade that covers various aspects of mobile payment development and adoption using the mobile phone handset as identified earlier (Antovski & Gusev, 2003; Kousaridas et al., 2008; Kreyer et al., 2003; Lee et al., 2005; Teo et al., 2005; van der Kar & van der Duin, 2004; Wessels & Drennan, 2010; Zmijewska, 2005). Whilst there has been some success of mobile phone payment adoption in a few countries around the world, the widespread adoption of mobile phone payments across all societies and in different countries has not yet happened (Chandra et al., 2010). Furthermore, Bohel and Krueger (2001) identify discrete payment cultures within the various countries in Europe including French consumers with smart cards and German consumers with debit cards.

The more recent technology deployment of NFC capabilities in various marketplaces means that consumers can initiate proximity mobile payments using both mobile phone handsets that have this NFC capability but also with NFC enabled chip based EMV smart cards. As this proximity payment capability is in the early stages of deployment (European Payments Council, 2012; de Meijer & Bye, 2011; Vocalink, 2013) there is an opportunity to add to the existing academic research on consumer behaviour covering consumer motivation, consumer interest, consumer requirements and consumer intention to adopt proximity mobile payments. Numerous mobile payment pilot schemes have been launched around the world by well established companies and a number of new start-up companies with various pilot schemes based upon innovative and developing technologies with no clear standardisation and limited barriers to market entry (Banco Santander, 2012; Deutsche Telekom, 2012; Finextra, 2012a-2012f; HSBC, 2012; La Caixa, 2012; Post Office, 2012; VISA, 2012b; Vodafone, 2015a). In addition, the range of consumer devices that support mobile payments continues to develop and includes the provision of bPay wristbands that allow commuters on the c2c London rail network to pay for journeys, up to the value of £30, with just the tap of a wrist (Barclays Bank, 2015). Furthermore, wearables such as bPay

wristbands appeal to the 18 to 30 year old UK consumers according to Intelligent Environments (2015).

The different evolving mobile payment schemes may address different consumer interests and different consumer adoption experiences with varying measures of success dependent upon the specific and unique conditions of each market (Swatch, 2015). The mobile payment phenomenon is in the development phase of the Industry life-cycle model as it is continually evolving as shown in Figure 6 - Industry Life-cycle model below:

Industry Life-cycle model

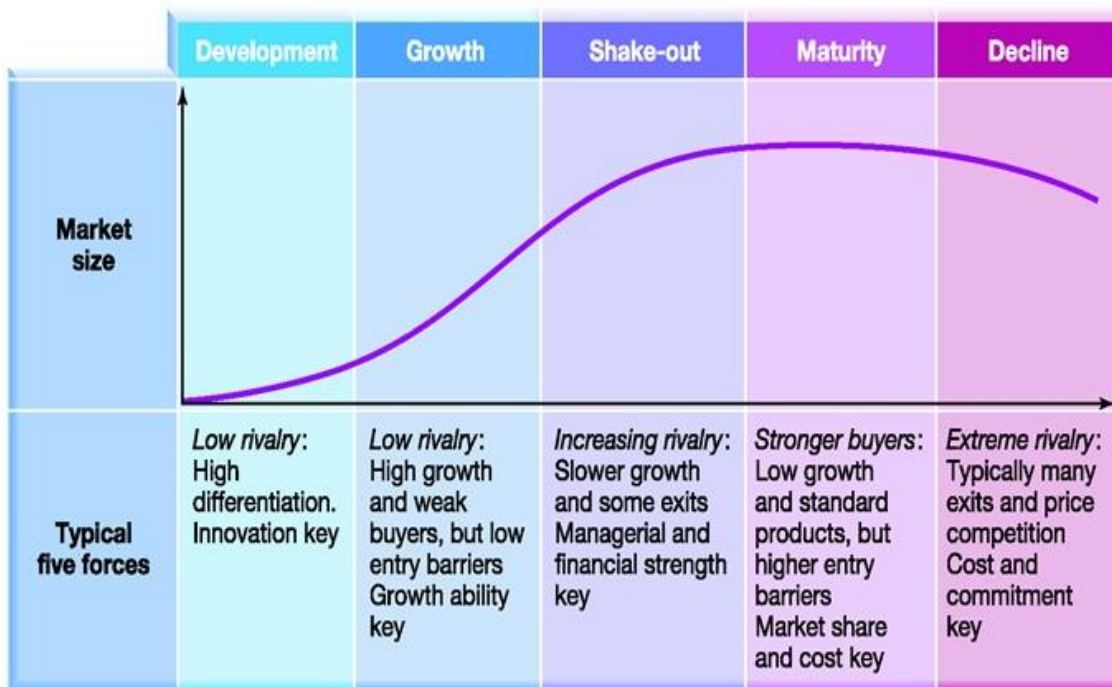


Figure 6 - Industry Life-cycle model (Rodrigo, 2012)

Smart phones are Information Technology devices with storage, computing and transmission capabilities that can act as payment devices as well as electronic distribution channels (Ondrus, Camponovo & Pigneur, 2005). There has been a large growth in the number of consumers with smart phones as over 1,004.2 million smart phones were distributed worldwide in 2013 (+38.4% on 2012) and are becoming more

widespread than personal computers in the UK (IDC, 2015). The adoption of smart phones by UK consumers provides an opportunity for banks to extend their mobile payments to a wider consumer base or to at least maintain their market share, although it similarly provides a business opportunity for new companies to enter the payment market including MNOs. However, the role of the MNO in the mobile phone based payment market has not yet been defined although a MNO has very limited financial consumer risk expertise (Ondrus & Pigneur, 2005). Vodafone (2015a) is a major MNO and has announced an extension to their current mobile payments market service which includes storing bank contactless card details within the Vodafone SIM for consumers in Germany, Spain, UK, Italy and Netherlands (Vodafone, 2015a). Furthermore, Orange (2015) have launched their mobile wallet app which is now available nationwide in France. In addition, Swatch (2015) has teamed up with China UnionPay and Bank of Communications to introduce a watch with inbuilt contactless payments functionality.

Banks have extensive experience in risk and fraud management along with experience in operating mass-market payment systems which is critical for a wide adoption of mobile payments (Bourreau & Verdier, 2010). A partnership approach on mobile payments through a smart phone handset is dependent upon a MNO and a bank agreeing a suitable business relationship that is acceptable to both organisations although this may be specific country or market dependent as demonstrated by the agreements established to date (Deutsche Telekom, 2012; Finextra, 2012a-2012c; Finextra, 2012f). In a further development in 2014 VISA and MasterCard announced a mobile payment service option that avoids a bank having to collaborate with a MNO for mobile payments on a smart phone (Finextra, 2014).

Information Technology and new distribution channels are two key drivers of strategic change that can provide the platform for a fundamental paradigm shift in the provision of mobile payments (Dibbs, Simkin, Pride & Ferrel, 2001). Furthermore, Lu et al. (2011) suggest that there is no consensus on whether mobile payments are a new payment instrument or merely a new access channel to existing payment services. Lu et al. (2011) go on to state that academic literature on modern Information Systems looks at

the determinants of the mobile based environment and have not addressed their effect on consumers. Furthermore, the wide adoption of Information Technology in society has resulted in an increase in the number of small value payments in an electronic environment according to Petrauskas and Zumaras (2008) who go on to claim that mobile phones are an integral part of many people's life and that a payment made through a mobile phone is a new payment solution in the intellectual economy.

As previously identified the success of mobile payments varies substantially between countries with developed countries having sophisticated payment systems infrastructure with consumers holding more payment cards than mobile phones whilst developing countries have very limited payment and banking systems (Bourreau & Verdier, 2010). However, mobile phone payments do not require the complex payments infrastructure that is prevalent in developed countries and as a result consumer adoption of mobile phone payments in developing countries may be determined by a different set of consumer requirements and motivations. Mobile phone banking including mobile payments in Kenya has been highly successful as over 50% of the adult population use the MPESA mobile money system (BBC News, 2010) and this figure is growing rapidly according to Perlman (2010). The success of MPESA in Kenya has resulted in the launch of similar mobile payments systems in other African countries. Mobile banking and payment services are provided for various reasons including reduced operational costs as the consumer initiates and completes a payment transaction with no bank staff involvement (Cunningham, Young & Gerlach, 2009). However, mobile payments provides an improved service as payments can be made at any time and in any location convenient to the consumer (Zmijewska, 2005).

The contactless EMV smart card is the most recent payment instrument in a long line of payment instruments that allows a consumer to make a payment that require no bank branch staff involvement (Polasik, Wisniewski & Lightfoot, 2012) and contactless smart cards were originated by MasterCard in Orlando, Florida in 2002 (Capizzi & Ferguson, 2005). Regardless of the origins of contactless smart cards and the length of time they have been available in one or more markets, Eastwood (2008) suggests that contactless smart cards will compete effectively with cash for low-value transactions.

This concept of electronic payments replacing cash is supported by Ondrus and Pigneur (2005) who identify an extensive use of EMV credit and debit cards in the UK for purchases up to £30 and demonstrates that consumers will move away from cash-based transactions in specific environments and in specific situations.

Mobile payments is a recent phenomenon that is borne out by current and widespread academic publications that are dated 2007 and later according to Diniz et al. (2011) although to date have been predominantly based upon the use of a mobile phone handset and the mobile phone 'over the air' communications (Kim et al., 2010; Ondrus & Pigneur, 2005; Pousttchi, 2004; Zong, 2009). Whilst existing research covers a wide variety of aspects including trust, security, intention, acceptance, adoption and technology, these are predominantly focused on specific countries or regions including Italy (Ghezzi, Renga, Balocco & Pescetto, 2010); Netherlands (Waris, Mubarik & Pau, 2006); Finland (Zong, 2009) and developing countries (Duncombe & Boateng, 2009). As a result, there are a number of gaps in academic literature on mobile payments including geographical, methodological and conceptual aspects according to Duncombe and Boateng (2009). In addition, MasterCard (2012a) identify that UK consumers show the highest levels of familiarity and willingness to use mobile payments in the European region whilst Saga (2015) identify that one in five UK consumers aged over 50 who have a contactless card use it up to three times a week.

The use of an EMV payment card as a UK consumer payment instrument using chip and PIN is a well-established process although van Hove (2004) suggests that the success of contactless mobile payments may be more difficult in countries where debit cards can be used for lower-value payments. However, other mobile payment devices including rings and bracelets are identified as of interest to UK consumers as payment instruments and Barclaycard (2014) have extended the range of mobile payment devices to include a trial of tap and pay woollen gloves. Furthermore, a global market mobile payments assessment by MasterCard (2012a) identifies that even with advanced infrastructures and sophisticated technology networks, consumer readiness is a critical success factor. Widespread adoption of mobile payments is dependent upon consumers embracing the new payment facilities whilst MasterCard (2012a, p. 2)

state that “consumer familiarity, willingness, and actual usage are necessary conditions for mobile payments to take off”.

3.4 Summary

The first section of this chapter reviewed the various academic mobile payment definitions which identified that mobile payment is a new form of electronic payment (Viehland & Leong, 2007). The chapter went on to identify that there is no consensus on the definition of mobile payments with a very broad range of criteria being used which has resulted in considerable inconsistency in the use of the terminology as well as the meaning of that terminology.

The chapter then went on to review the historical context to mobile payments which identifies that mobile payments are in the development cycle for the UK despite the numerous mobile payment programmes that have been launched over the last 10+ years. Contemporary literature on mobile payments was then explored that include the more recent technology developments that have led to the adoption of contactless payments with EMV cards but latterly with a smart phone by UK consumers (Apple, 2015a; TfL, 2015; UK Cards Association, 2015a). The complex dynamics of the mobile phone payment service covering the MNO and the financial institutions was then reviewed prior to reviewing the various mobile payment developments in markets around the world.

In summary, the previous chapter identified that there are currently two key discrete mobile payment developments according to Khan and Craig-Lees (2009). The first mobile payment development is based upon an EMV smart card that can be used for contactless payments (Barclaycard, 2009; Finextra, 2010; HSBC, 2012; Lloyds TSB, 2011; Post Office, 2012) which can compete effectively with cash for low-value transactions up to £30 from September 2015 (Eastwood, 2008; Ondrus & Pigneur, 2005) and demonstrates that UK consumers can be enticed to move away from cash-based transactions in specific situations where a benefit is obtained (TfL, 2015). The other key mobile payment development is based upon a mobile wallet within a mobile phone handset which Vodafone (2015a) as a MNO supports.

The next chapter narrows the literature review of mobile payments into consumer payment purchase behaviour with a focus on consumer perceptions of payment technology, perceived usefulness and perceived ease of use, perceived trust and perceived risk. The chapter then discusses the various research models that apply to consumer technology acceptance before going on to explain how these aspects are used to develop the various research propositions that this research explores within the human psychology framework. The chapter concludes with a description and justification for the conceptual model that uses the core TAM framework of cognitive response and affective response as the TAM has been used for a substantial amount of consumer focussed technology research with findings that support the robustness of the TAM's core framework (Venkatesh, 2006). However the core TAM framework is extended to include additional constructs of trust and risk to create a conceptual model that has increased validity for the research purpose.

4 Consumer Purchase Behaviour

4.1 Introduction

The previous chapter identified that a mobile payment is a new form of electronic payment (Viehland & Leong, 2007) and that there is no consensus on the definition of mobile payments with a very broad range of criteria being used. Moreover, mobile payment and mobile banking are interchangeable descriptions (Karnouskos & Fokus, 2004) which has resulted in considerable inconsistency in the terminology used as well as the meaning of that terminology.

The historical development of mobile payments based upon mobile phones was then explored before the chapter went on to review consumer based technology developments that include smart phones as enabling consumer mobile payment devices. The more recent development of NFC chip-based mobile devices was then reviewed as this provides consumers with contactless mobile payment capabilities on an extended range of consumer held devices (ANZ, 2015; ApplePay, 2015; Commonwealth Bank of Australia, 2015; SamsungPay, 2015b; VISA 2014).

This chapter commences with a review of consumer behaviour that includes pre-purchase psychological conditions as these lead to consumer intention. The research lens is then narrowed to consumer perception and then narrows further to consumer perceptions of the payment instruments. Consumer perceptions of usefulness and ease of use are then reviewed along with perceptions of trust and risk as these influence consumer attitude. The final section of this chapter reviews the consumer psychology research models that have a focus on information technology adoption (Chau, 1996) prior to the conceptual model being defined and justified. The use of the core framework of the TAM as the foundation for the conceptual model is then explained and justified. This is followed by a review of the conceptual model that includes the addition of, and justification for, three new constructs and research propositions that are explored. The key theoretical positions that this research takes for each of the three sections of this chapter and the key theories for each are shown in Figure 7 - Consumer Purchase Behaviour Chapter Structure below:

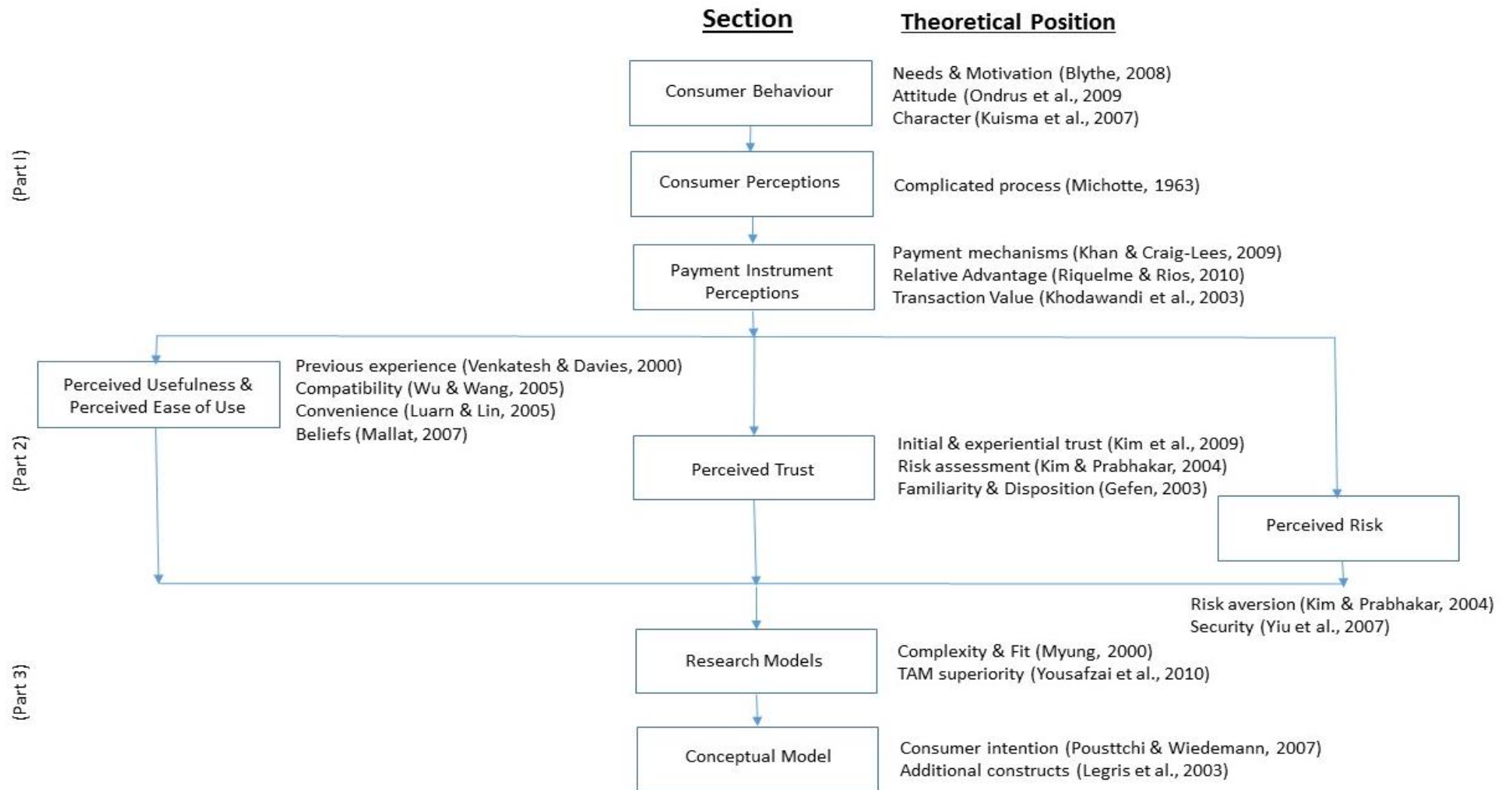


Figure 7 - Consumer Purchase Behaviour Chapter Structure

4.2 Consumer Behaviour

Consumer behaviour refers to activities that consumers undertake when making a purchase and then use the products and services according to Blackwell et al. (2006) which includes choice of the payment instrument to actually pay for products and services (Blythe, 2008). Consumer behaviour is also defined as the various activities that an individual undertakes to address their needs through thoughts related to product and service interest prior to any purchase influence or decision (Babin & Harris, 2012; de Mooji, 2011). This is referred to as 'pre-purchase conditions' and is a much broader definition than that of Blackwell et al. (2006). Pre-purchase conditions exist within a consumer's psychological state of mind and include consumer interest, consumer need and consumer motivation. All of these psychological positions have to be fulfilled in order that consumer intention occurs as this leads to consumer behaviour to fulfil the identified need. This definition suggests that consumer behaviour commences at a much earlier stage than the actual purchasing activity and, as a result, includes consumer recognition and consumer acceptance that can subsequently lead to adoption. However, none of these definitions specifically mention mobile phone or EMV smart card payments which are consumer enabled electronic payment instruments that extend existing electronic payment methods; albeit these are new and evolving payment instruments.

According to Blythe (2008) consumer needs and motivation are determined by rational thoughts and reasons although symbolic and emotional reasons can also apply to consumer decision making (Schiffman, Kanuk & Wisenblit, 2010; Wright, 2006) which may explain why consumer behaviour cannot be reasonably predicted. However, Blackwell et al. (2006) suggest that a consumer need arises when the desired state is inconsistent with actual specific situation although this may only apply to that particular moment in time but can also be retained for some time thereafter. Furthermore, consumer motivation results in goal directed behaviour that commences with a stimulus that subsequently generates a consumer need (Mowen & Minor, 2001). Whilst consumer motivation can be used to address an identified need, it can be affected by a variety of factors including personal relevance, perceived risks and the individual consumer values (Noel, 2009).

In addition, consumer attitude is an integral part of human psychology as consumer behaviour determines the payment method chosen (Ondrus et al., 2009; Viehland & Leong, 2007) although the definitions of attitude vary with considerable divergence on the precise meaning. Most contemporary social psychologists generally agree that the characteristic attribute of attitude is the evaluative nature as it is a theoretical construct that cannot be observed and must be calculated from quantifiable responses according to Ajzen (1988). Furthermore, Ajzen (1988) also suggests that attitude is not instinctive but develops as a result of the various influences that each consumer receives which includes any learning that is retained. However, the wider definition of consumer attitude proposed by Babin and Harris (2012) suggests that consumer behaviour commences with consumer recognition which leads to consumer acceptance and finally to consumer adoption and various consumer perceptions apply to each of these different aspects of consumer behaviour.

The relationship between consumer attitudes and consumer behaviour is influenced by areas which surround patterns of consumption (Chisnall, 1997), although personal consumption is actually undertaken in a social and cultural environment where social and cultural norms directly and indirectly affect personal consumption. Furthermore, consumer habits are affected by cultural beliefs and values, social aspirations and inhibitions whereas attitudes are characterised by consumer predisposition to act in a specific way as a result of receiving an external stimuli (Yang, Lu, Gupta, Cao & Zhang, 2012). Consumer culture and behaviour vary across and within countries as consumers are not only influenced by the wider society within which they live but also by their local society (de Mooji, 2011). Whilst consumption is a thoroughly cultural phenomenon there is a solid relationship between the culture of western developed societies and the dependence upon consumption (Miles, 2006). Chip and PIN authenticated card payments are widely adopted by UK consumers (King, 2012) and consumer attitude and consumer behaviour are influenced by society that can affect the success of mobile payment adoption.

Organisations attempt to influence the desired state of consumers through a multitude of influences in order to stimulate product or payment instrument interest as this leads to subsequent consumer adoption (Peter & Olson, 2004). These influences include

direct messages such as advertising of payment instrument and indirect messages that may be received by the consumer through discussion with friends or accessing social networks. A number of these influences will be dismissed as having no personal interest (Schiffman et al., 2010) whilst a few influences that are comprehended become part of the individual consumer's cognitive map (Babin & Harris, 2012). However, despite consumers being exposed to various influences there is no guarantee that a consumer will identify a need related to the payment instrument or product and as a result adoption may not occur (Chisnall, 1997).

A consumer's character and attitude are also factors that influence whether an individual identifies with and then selects a payment instrument (Kuisma, Laukkanen & Hiltunen, 2007; Srijumpa, Speece & Paul, 2002). The influential consumer characteristics include technical competence (Davis, 1993) and personal enjoyment including the achievement of overcoming technical challenges (Dabholkar & Bagozzi, 2002). However, a consumer has to initially identify a benefit from using a payment instrument which then generates the motivation to complete the purchase. Furthermore, a payment instrument that is based upon technology also requires the consumer to have the competence and desire to overcome any technical challenges that may arise along with a willingness of the consumer to obtain the relevant knowledge in how to use the particular technology (Agarwal & Prasad, 1999). The acquisition and adoption of technology based payment instruments presents many challenges for the consumer that are specific to the particular technology, the individual user and to the actual environment within which the technology is used. However, many of the consumer focussed technology products provide direct control to the consumer over the set-up and operation of the technology itself and is referred to as self-service technology (Curran & Meuter, 2005). An individual's intention to use a self-service technology is driven by multiple, hierarchical attitudes and characteristics according to Curran, Meuter and Surprenant (2003). In addition, consumer participation directly influences service quality and behavioural outcomes including service usage, repeat behaviour and word-of-mouth adoption of self-service technology (Bolton & Saxena-Iyer, 2009).

Mental readiness of each consumer to accept new technologies has four characteristics of optimism, innovativeness, discomfort and insecurity that influence attitude towards self-service technology and adoption behaviour (Liljander, Gillberg, Gummerus & van Riel, 2006). Optimism is one of the words that best explains consumer behaviour towards self-service technology and has a direct effect on attitude whereas innovativeness has only a marginal effect on attitudes whilst discomfort and insecurity appear to have no measurable effect on consumer behaviour according to Liljander et al. (2006).

4.3 Consumer Perceptions

Consumer perception is the main social cognitive connection with the day to day world (Efron, 1969) and is an integral part of the way that humans interpret, analyse and remember information and is also referred to as awareness (Baron, Branscombe & Byrne, 2008). Social cognition is the internal human factors and related mental processes that can be regarded as a part of cognitive psychology which includes memory, perception and information processing related to the study of an external entity in a social setting (Pennington, 2000). Perception is a process that involves the recognition and interpretation of sensory information that registers in the brain which Miller and Johnson-Laird (1976, p. 31) refer to this as “an internal representation of an external object (*that*) is constructed from the receptors” although there is some overlap between perception and sensation according to Rookes and Willson (2000).

The broad concept of perception sits within cognitive psychology and the relationship with sensory information although there is no independent and verifiable way of identifying and isolating perception from other conscious processes including sensation (Efron, 1969). As a result, all descriptions of perception are based upon a form of measurement of the human capacity to discriminate in various ways. Whilst different forms of perception have been identified (Harnad, 1987; Miller and Johnson-Laird, 1976, Powers, 1973), perception has never been adequately defined and accepted as the boundaries of perception within cognitive theory are vague and arbitrary and include subjective judgement (Miller & Johnson-Laird, 1976). Furthermore, perception is just one phase of a complicated process where a consumer

initiates and directs thought in order to stimulate an action and adjusts the action based upon the situation that exists at that moment (Michotte, 1963) which Miller and Johnson-Laird (1976, p.39) describe as “the most compelling fact of perception is that people see objects”.

The definition of perception used in this research is all types of direct and immediate human awareness related to an external reality or entity.

4.4 Payment Instrument Perceptions

Behavioural science and psychology literature identify that social image and individual innovativeness are important consumer traits and both social influences and personal traits can be important influences in the choice of payment instrument (Venkatesh, Morris, Davis & Davis, 2003; Wu & Lederer, 2009). Consumers in the UK and various societies have widely adopted electronic payments in addition to the more traditional form of cash payments with notes and coins (Sathye, 1999). However, consumers have different perceptions of electronic payments compared to the more traditional forms of money (Khan & Craig-Lees, 2009), although a number of new electronic payments have been rapidly and widely adopted in different societies (Ward, 2006). Furthermore, various electronic payment methods have been successfully developed and deployed by banking institutions and other payment organisations, particularly in Asia (Carr, 2007).

Adoption of new electronic payments arises from the identification by consumers of perceived relative advantage of using the new electronic payment method (Riquelme & Rios, 2010) where relative advantage is the degree to which the payment innovation is perceived to be better than that which it superseded (Karayanni, 2003; Rogers, 2010). When superior performance of a payment instrument is identified through the identification of a relative advantage then consumer behaviour changes (Ram & Sheth, 1989). Consumers select and use the most suitable payment instrument that has the best perceived value at the time of purchase which can include financial value including payment terms; practicality value including speed and convenience; and psychological value including trust and fashion (Ondrus et al., 2009). The identification of the payment need by the consumer together with the identification and acceptance of the

payment instrument leads to adoption which supports the financial exchange (Ram & Sheth, 1989). However, if consumers do not perceive any relative advantage then adoption can be delayed or does not occur at all, whilst adoption can still fail even when the technology fully addresses the requirements (Blythin, Hughes, Kristoffersen, Rodden & Rouncefield, 1997).

The development of information technology has resulted in embedded microprocessors being integrated into payment cards to produce an EMV smart card (Trask & Meyerstein, 1999) which is an electronic form of consumer payment that has seen rapid consumer adoption in the UK and in many other countries (Humphrey, Pulley & Vesala, 1996). An EMV smart card is a payment instrument that supports a financial exchange when the consumer uses the card. The use of the EMV card requires entry of a PIN into a point-of-sale terminal that is used to authenticate the consumer with a transfer of the financial value from the consumer to the provider (Ward, 2006). The widespread adoption of EMV smart cards by consumers assists the banks through reducing the escalating fraud losses that arise from the easy counterfeit of magnetic stripe based cards which were the EMV smart card predecessor (Haddad, 2005; Ward, 2006). However, whilst the volume of UK card payments has been increasing, cash is still the predominant form of payment due to the benefit of cash as a payment instrument (Boeschoten, 1998) and accounted for 52% of the total volume of UK payments (UK Payments Administration, 2014)

The more recent development of contactless smart cards is an extension to existing EMV smart card technology (Rankl & Effing, 2010) which is fully consistent with the technology piggyback approach identified by Odlyzko (2003). EMV contactless card payment facility is in the early stages of deployment in a number of countries across Europe including UK along with countries in Asia and North America (VISA, 2012a). A contactless EMV card payment is a mobile payment according to the definitions proposed by Bourreau and Verdier (2010), European Commission (2012), European Payments Council (2012) and Karnouskos and Vilmos (2004). However this mobile payment definition is not consistent with other academic definitions of mobile payments that have historically and predominantly focussed on a mobile phone handset to support a mobile payment transactions using the MNO technology.

Whilst the piggybacking of the contactless mobile technology on EMV smart cards may lead to adoption in societies where payment cards are an accepted payment instrument, there are other societies where cards are not as widely accepted or adopted. As a result, other forms of consumer enabled payment devices may be adopted in non-card based societies for mobile payments. An alternative mobile payment has already been adopted in China where the mobile payments market is primarily used for micro-payments with the payment service provided by the MNO through the mobile phone handset (Lu et al., 2011). This specific mobile payment market in China has developed as the income from these mobile micro-payments is insufficient to compensate financial institutions for the setup and ongoing operating expenses of providing such a service according to Lu et al. (2011).

Lower value cash transaction payments provide an opportunity for other forms of electronic payment aimed specifically at this market segment, although any new payment facility is unlikely to succeed where special hardware or software is required. However, a new payment instrument that can piggyback on top of an existing widely adopted device has a substantially improved chance of adoption (Odlyzko, 2003). The concept of micro-payments is well supported in academic literature and Zmijewska, Lawrence and Steele (2004a) suggest a value of €10 that is consistent with Garner, Edwards and Colton (2006) whilst Jaring, Matinmikko and Abrahamsson (2006) suggest any transaction with a value that ranges from €1 to €10 whilst Viehland and Leong (2007) provide a 20 cent text message as an example of a micro-payment.

Khodawandi, Pousttchi and Wiedemann (2003) suggest that mobile payments are most likely to address consumer payment needs for transactions up to €50 which includes micro-payments, although there exists a solid basis for acceptance at all different amounts according to Au and Kauffman (2007). Consumers have different perceptions of risk based upon the payment transaction value or the type of goods or services being purchased and this affects the choice of payment mechanism used (Bounie & Francois, 2006). Micro-payments are particularly suited to mobile payments as these much lower value payment transactions may well have a lower associated perceived risk for consumers that results in an increased adoption rate (Zmijewska et al., 2004a) although, mobile payment adoption is optional as consumers can continue to use

existing forms of payment including cash (Lu et al., 2011). Previous academic studies have suggested that mobile payments can be used for both micro-payments and macro-payments as mobile payments provide an anytime and anywhere payment facility (Au and Kauffman, 2007; Khodawandi et al., 2003; Yang et al., 2012). However, whilst there may be a perceived relative advantage of using mobile payments, adoption is dependent upon consumers understanding and accepting the relative advantage of the new payment instrument.

Consumers in western societies are heavy users of debit cards, credit cards and cheques as payment instruments although there has been a progressive move by UK consumers to the use of debit card payments and online payments in recent years and 94% of UK consumers aged 24 and under do not use cheques at all (Cheque & Credit Clearing Co., 2013). However, a number of countries including China and Japan retain cash-centric payment cultures and social influence affects individual decision making (Lu et al., 2011). These social influences are based upon the perceived expectations of other people who are important to that individual (Fishbein & Ajzen, 1975) and has an increased importance in societies that have a high collective culture where individuals respond more to influences and seek to establish a favourable image with their peers (Chong et al., 2012; Yang et al., 2012). Perceived public image plays an important role in electronic payment instrument adoption for consumers in high collective cultures (Lu et al., 2011). As a result mobile payment adoption may occur more readily in societies where mobile payments are considered a lifestyle service by consumers. In addition, Khan and Craig-Lees (2009) identify that a number of academic studies show that money perceptions and use vary across different social and cultural contexts (Bohannon, 1955; Demosthenous, Robertson, Cabraal & Singh, 2006; Fleming, Taiapa, Pasikale & Easting, 1997; Singh, 2000; Zelizer, 1994) but also by age and experience (Pahl, 1999) and money management skills (Garcia-Swartz, Hahn & Layne-Farrar, 2007). This research explores cultural perceptions of mobile payments with UK consumers which is a low collective cultural society (Yang et al., 2012). As a result, social influence has little, if any effect on perceived usefulness and behavioural intention to use electronic payment instruments (Venkatesh & Davis, 2000; Venkatesh, Morris, Davis & Davis, 2003).

Consumer adoption of various forms of electronic payments has occurred following the widespread adoption of e-commerce and has resulted in widespread change in consumer behaviour choice of payment instrument (Mangiaracina & Perego, 2009). Furthermore, consumers who frequently use internet banking and electronic payments with e-commerce have less resistance to adopting the mobile version as consumers' payment habits do not change when moving from an e-commerce environment to an m-commerce environment despite the different consumer devices used to make electronic payments (Lu et al., 2011).

4.5 Perceived Usefulness and Perceived Ease of Use

Perceived usefulness and perceived ease of use are two key aspects of the TAM that influence a consumer's attitude toward using an electronic payment system, which in turn influences subsequent adoption (Davis, 1993). This theory suggests that the more positive the consumer perceives ease of use and perceived usefulness of the electronic payment system, the higher the probability that adoption will actually occur. In addition, Davis et al. (1989) and Davis (1993) suggest that perceived ease of use has a direct impact upon perceived usefulness, but not vice versa. Furthermore, Information Systems literature suggests that perceived usefulness and perceived ease of use are important factors that influence consumer technology adoption (Chen, 2008; Dahlberg et al., 2008).

The original focus of the TAM was on an information system within an organisational context although the last couple of decades have seen a rapid development and widespread adoption of consumer focussed information technology (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005; IDC, 2015; Ling, 2004). Individual consumers adopt information technology systems for personal gain that is distinct from the original business context to which these two definitions originally applied (Gu et al., 2009). As a result, many researchers over the last two decades have used the TAM to explore a consumer's acceptance and adoption of new technologies. A number of these identify that perceived usefulness and perceived ease of use are two key constructs that influence an individual's acceptance and adoption of technology (Adams, Nelson, & Todd, 1992; Agarwal & Karahanna, 2000; Davis, 1989; Davis et al., 1989; Doll et al.,

1998; Hendrickson, Massey, & Cronan, 1993; Mathieson, 1991; Mohammadi, 2015; Mortimer, Neale, Hasan & Dunphy, 2015; Segars & Grover, 1993).

Perceived ease of use is an individual's feelings on self-efficacy according to Davis et al. (1989) and is a personal judgment of an individual's ability to use the technology effectively (Bandura, 1991). Any new information technology system, including mobile payments, requires consumers to adopt it with no previous direct experience and, as a result, consumers rely upon their personal assessment of the technology's perceived ease of use. Consumer assessment is based upon the beliefs that are formed from previous experiences with other information technologies along with previous experience on technology's use (Venkatesh & Davies, 2000). Consumer focussed information technologies such as PCs, tablet computers and smart phones are complex devices and as a result an element of consumer uncertainty exists with respect to their successful adoption (Amirkhani, Salehahmadi, Kheiri & Hajjaliasqari, 2011). Furthermore, consumers may have a negative image of computers, the internet and technology in general as they perceive that it is hard to use (Fain & Roberts, 1997). This negative image can be based upon an individual consumers' anxiety towards computers which is a fairly common occurrence (Kay, 1993) although Meuter, Ostrom, Bitner, & Roundtree (2003) suggest that this is a result of a consumer's negative state of mind about technology generally.

Technical support for consumers has a positive influence on perceived usefulness (Chung & Kwon, 2009) as it increases a consumer's intention whilst decreasing resistance to embracing new technology developments and leads to consumers overcoming their fear of technology. In addition, information and guidance on mobile banking increases the perceived value to consumers whilst decreasing the perceived risks of technology innovation (Laukkanen & Kiviniemi, 2010).

Furthermore, many academic studies identify that perceived usefulness is an important influence on consumer adoption of mobile commerce and mobile internet (Chong, Darmawan, Ooi & Lin, 2010; Hsu & Lu, 2004; Lu et al., 2005; Wei et al. 2009) whilst perceived usefulness substantially influences mobile banking adoption (Luarn & Lin, 2005; Mohammadi, 2015; Mortimer et al., 2015). Perceived usefulness is an

important influence of personal consumer technology adoption according to Jeyaraj, Rottman and Lacity (2006) and self-service technology (Kaushik & Rahman, 2015). Perceived usefulness is a strong influence in male adoption of mobile payment technology whilst female adoption of mobile payment technology is based upon perception of the technology's ease of use according to Rouibah (2009). However, Riquelme and Rios (2010) identify that a female's increased perceived ease of use of mobile banking services in Singapore leads to an increase in perceived usefulness.

Perceived usefulness of mobile services is an anywhere anytime concept in a personal consumer situation whilst perceived ease of use is how consumers view a new information technology system and the potential amount of effort required to successfully use it (Venkatesh, 1999). Both perceived usefulness and perceived ease of use are recognised as influencing consumer attitude which produces a behavioural intention that subsequently influences the actual adoption and usage of an information system such as mobile payments (Davis, 1989). In addition, perceived ease of use is an influence on perceived usefulness as the easier a consumer perceives the information system is, then the more useful that information system is perceived to be (Kleijnen, Wetzels & De Ruyter, 2004). However, both convenience and perceived ease of use of internet banking or mobile banking are not that important to consumers (Rawashdeh, 2015; Sikdar, Kumar & Makkad, 2015; Yadav, Chauhan & Pathak, 2015) whilst Chinese consumers appear to be more traditional and less affected by technology advancement compared to consumers in Singapore (Gerrard & Cunningham, 2003). This is in contrast to consumers in Taiwan where convenience and perceived ease of use are identified as highly important (Luarn & Lin, 2005; Wu & Wang, 2005) although perceived usefulness is one of a number of key factors in mobile banking adoption (Hanafizadeh, Behboudi, Koshksaray & Tabar, 2014; Mohammadi, 2015; Mortimer et al., 2015; Koenig-Lewis et al., 2010). Whilst social influence has a positive effect on perceived usefulness (Gefen & Straub, 1997; Hsu & Lu, 2004; Taylor & Todd, 1995) research by Venkatesh and Davis (2000) and Venkatesh and Davis (2003) suggests that social influence has no influence on perceived usefulness and behavioural intention within financial services.

In addition, perceived ease of use of a mobile service has a positive influence on the perceived usefulness and is the extent to which a consumer believes it is easy to learn to use or adopt which then has a positive influence on consumer attitude (Kleijnen et al., 2004). Perceived ease of use and perceived usefulness fail to effectively discriminate between adopters and non-adopters of contactless credit cards in Taiwan (Wang & Lin, 2008). However, various empirical studies support the view that perceived usefulness is a primary antecedent of information technology usage (Gefen & Straub, 1997, 2000; Hsu & Lu, 2004; Igbaria et al., 1997; Venkatesh, 1999; Venkatesh & Davis, 2000).

Ease of use is affected by the design of Apps and consumer interaction on smart phones that can substantially affect interest and subsequently affect adoption (Khan & Craig-Lees, 2009; Venkatesh, 2000; Venkatesh et al., 2003). A consumer has to use an App on a smart phone to make a mobile payment and this is a complex activity that requires menu navigation through handset settings (Kleijnen et al., 2004). Categorized and labelled menus are used for smart phone navigation and exert substantial influence on consumer behaviour and perceptions (McDonald & Schvaneveldt, 1998). In addition, multiple key entries to undertake a mobile payment can lead to navigation errors (Albers & Kim, 2000). Moreover, smart phone consumers are more likely to be under time pressure compared to internet users which produces more errors trying to accomplish a task in a mobile environment (Chae & Kim, 2004). As a result, smart phone consumers suffer more severely from undesired outcomes compared to stationary internet users (Nielsen & Ramsay, 2000) although Shaikh and Karjaluoto (2015) identify that limited research has been undertaken on consumer adoption of mobile banking using smartphones.

Consumers have five specific beliefs that apply to new electronic payment instruments such as mobile payments and these are skills compatibility, social norms, trustworthiness, relevance and ease of use added to which both age and profession are differentiating factors in consumer adoption of new electronic payment instruments (Mallat, 2007). Smart card payments have no advantages over payment by cash for a number of consumers due to the perceived disadvantages that include lack of security and complexity. However, there are a few exceptions where consumer

incentives are offered that are sufficiently attractive to consumers that overcome the perceived disadvantages (Dahlberg & Mallat, 2002). In addition, payment technology compatibility with a consumer's perspective and interest leads to an increased perceived ease of use as less effort is required to ensure understanding (Agarwal & Karahanna, 1998; Wu & Wang, 2005). Consumers with a more innovative disposition recognise the value of an innovation more easily according to Agarwal and Karahanna (1998) and may be early adopters of technology innovations. Some consumers are smart phone literate compared to others and these consumers are more likely to have an increased trust in the mobile channel and the underlying technology (Koenig-Lewis et al., 2010).

A mobile payment has a number of benefits including increased speed of making a payment, consumer convenience and safety (Carter, 2005; Noe, 2005) which is consistent with research findings by VocaLink (2010) across five countries (Canada, Germany, Great Britain, Malaysia and USA). The three most cited consumer reasons to make payments with a mobile phone are convenience with ease of use (34%), overall convenience (25%) and speed (23%). However, consumers in Great Britain have the lowest appetite for mobile payments in VocaLink's study as the existing range of payment options in the UK includes the adoption of PIN verified EMV payment cards that have a high perceived usefulness value when compared to other countries (Smart Card Alliance, 2013).

4.6 Perceptions of Trust

The trust concept commenced in economics, social psychology and sociology before being extended to other disciplines including marketing, management and information systems and comprises two aspects that are trustworthiness and trust (Shankar et al., 2002).

Trustworthiness is a multi-dimensional construct based upon a considerable number of measurement aspects (Roy & Shekhar, 2010) and is defined as the accumulated perceptual experiences that lead to trust between participants according to Caldwell and Clapham (2003). However, Buttner and Goritz (2008) define trustworthiness as belief based trust in an organisation. The lack of consensus on the definitions of

trustworthiness and trust may be due to the fact that these are complex concepts that are not well understood (Yan et al., 2009).

Trust is “the subjective probability with which consumers believe that a particular transaction will occur in a manner consistent with their confident expectations” according to Chellappa and Pavlou (2002, p.359). However, Sabel (1993) defines trust as mutual confidence that no party to a transaction will exploit any vulnerability. In addition, Roy and Shekhar (2010) suggest that consumer trust is a perception that the best interests of an individual will be upheld in any situation although consumers can trust, or distrust, various inter-related parts of a complex phenomenon (Medhi et al., 2009). However, whilst there are a variety of definitions of trust there is a consistent theme of a transaction being successfully completed that has no detrimental impact on the participants.

According to Kim et al. (2009) trust can be segmented into initial trust and experiential trust which are determined by different influences. When a new innovative service is provided, such as mobile payments, consumers are initially unable to base any trust decisions on prior experience and whilst experiential trust develops over time such trust does not exist when a new service is provided (Koufaris & Hampton-Sosa, 2004; McKnight, Cummings & Chervany, 1998). As a result, initial trust of mobile payments by consumers is based upon a risk assessment that each consumer undertakes consciously or subconsciously (Kim & Prabhakar, 2004) and is a key influence on a consumer’s decision to adopt mobile banking (Kim et al., 2009). In addition, the level of trust in a mobile payment organisation is also a key factor in the decision making process (Gefen et al., 2003a; Gefen & Straub, 2004; Pavlou & Gefen, 2004). However, trust assumes a much greater importance for consumers in financial services as it is only when consumers have built sufficient trust in the organisation providing mobile banking that those consumers use mobile banking technology and the mobile channel (Rotchanakitumnuai & Speece, 2003). In addition consumer trust in banks varies according to the product relationship (Jarvinen, 2014). Furthermore, organisational trust, consumer engagement channel trust and technology trust are critical determinants for mobile banking acceptance (Stewart, 1999; Yousafzai, Pallister, & Foxall, 2003).

Trust propensity, structural assurances and an organisation's reputation are key determinants for the establishment of initial trust (McKnight, Choudhury & Kacmar, 2002; Pennington, Wilcox & Grover, 2004). Structural assurances include legal resources, agreements, contracts, policies, consumer guarantees and context specific regulations (Gefen et al., 2003b; McKnight et al., 2002; Pavlou & Gefen, 2004; Zucker, 1986). Trust and particularly structural assurances have an increased importance for consumers with mobile payments and electronic channels as it involves an exchange of financial value (Kim & Prabhakar, 2004; McKnight et al., 1998; Pousttchi, 2003; Zmijewska et al., 2004a). Furthermore, vital aspects of accuracy, stability and safe financial services act as influences on a consumer intention to use an electronic banking service (Bhattacharjee, 2002; Gefen, Karahanna & Straub, 2003a). Consumers with a positive assessment of these vital aspects have an increased level of trust in internet banking and mobile services (McKnight et al., 1998) although consumers perceive mobile banking as easy to use when they have a familiarity with the service (Gu et al., 2009). Consumer trust in a bank is established when consumers interact through a mobile phone and believe that mobile banking services are easy to use (Gefen et al., 2003a) whilst trust is a key factor in consumer intention to use mobile payments (Shin, 2010; Yan et al., 2009). Furthermore consumer trust also has an effect on mobile banking adoption (Hanafizadeh et al., 2014; Kim et al., 2009; Luo, Li, Zhang and Shim, 2010), although Bews and Rossouw (2002) suggest that trust is taken for granted by consumers most of the time in their daily personal activities.

Trust is a key element in establishing and maintaining a relationship between a bank and its customers as trust significantly influences customer loyalty (Ball, Coelho & Machas 2004; Hoq, Sultana & Amin 2010). Consumer trust and confidence in the mobile payment provider are important influences that are critically influenced by the organisation's reputation (Anderson & Weitz, 1989; Xin, Techatassanasoontorn & Tan, 2013) as a positive reputation increases trust in the absence of any first-hand knowledge or experience (Lohse & Spiller, 1998). Convenience, flexibility and other perceived benefits contribute to the formation of initial trust by a consumer prior to the consumer actually using the service (Koufaris & Hampton-Sosa, 2004). Subsequent experiential trust is then established through reference to previous transactions as well

as reputation assessment (Pavlou, 2003), although trust is also affected by familiarity and disposition (Gefen, 2003; Gefen et al., 2003b). In addition, consumer trust of a payment system is influenced by anonymity, security, reliability, user control and the reputation of the mobile payment provider (Egger & Abrazhevich, 2001). Trust established on these criteria is a further determinant of consumer acceptance of mobile payments (Zmijewska et al., 2004a) whilst a consumer's degree of trust in an information technology system is an antecedent for subsequent usage (Dinev & Hart, 2003). Security and privacy are also important aspects of trust as these influence a consumer's decision to adopt m-commerce in Malaysia (Wei, Marthandan, Chong, Ooi & Arumugam, 2009) which is a risk averse society compared to their western counterparts (Hofstede, 1984; Hofstede, Hofstede & Minkov, 2010). However, mobile payments are widely adopted as a financial exchange mechanism in a number of risk averse societies (Chong et al., 2012).

Trust is a key construct extension to the original TAM (Gu et al., 2009) as trust influences behavioural intention (Gefen & Straub, 2004; Liu, Marchewka, Lu & Yu, 2005; Suh & Han, 2002; Wang & Benbasat, 2005). Trust also has an effect on perceived usefulness (Gu et al., 2009) and also influences both perceived ease of use and perceived usefulness in e-commerce according to Pavlou (2003).

4.7 Perceptions of Risk

Perceived risk has two different perspectives that are the probability of something happening and the consequences of the outcome should that risk actually happen (Cunningham, 1967). The perceived risk model proposed by Peter and Tarpey (1975) suggests that consumers minimise negative aspects that lead to adoption. However, when risk is perceived or identified by consumers the need for trust arises to mitigate the risk (Mayer, Davis & Schoorman, 1995) although risk and trust are inter-related in a consumer's decision making process (Morrison & Firmstone, 2000) as trust is an effective method used by consumers to address perceived risk and any related uncertainty (Gefen, 2000). Furthermore, the perceived level of risk diminishes when trust is established between the two parties that are involved in a specific transaction (Featherman & Pavlou, 2003).

Culture has an influence on consumer behaviour with large discrepancies between China and Western countries on consumer attitude towards online banking and mobile banking whilst perceived risks vary between different societies and cultures (Laforet & L, 2005). Adoption of new technology by consumers in societies that have a risk averse culture is adversely affected and as a result, consumers in these societies are less likely to adopt mobile payment technology (Kim & Prabhakar, 2004). Consumers in China identify that technology innovations come with perceived risks that each consumer assesses together with the perceived advantages of the innovation (Peng, Xiong & Yang, 2012). Consumer perception of risk in Taiwan and China is an important influence when acquiring and adopting new technology and is the most important factor that determines whether Chinese consumers adopt mobile banking (Laforet & Li, 2005; Yang, 2009). Furthermore, consumers in Australia are less inclined to adopt new payment methods when the perceived risk outweighs the benefits compared to existing forms of payment (Jarvenpaa, Tractinsky & Vitale, 2000).

Increased perceived risk exists in online transactions for consumers in the USA and is related to perceptions of financial, physical, social and psychological risks (Forsythe & Shi, 2003; Im, Kim and Han, 2008). Perceived security risk is a dominant influence of consumer intention to adopt mobile payments in various countries including Australia, USA and Finland (Featherman & Pavlou, 2003; Kuisma et al., 2007; Milind, 1999; Yiu, Grant & Edgar, 2007). Security risk is one of the top concerns for consumers working in the technology industry and nearly 50% consider mobile payments insecure whilst another 30% of business and IT professionals are not sure how safe they are (ISACA, 2015). Furthermore, Yang et al. (2012) identify that prior studies by Luarn and Lin (2005) and Shin (2009) indicate that perceived risk is a major factor in South Korean consumer resistance to mobile services that have financial implications whilst it is a pivotal factor in technology based consumer behaviour according to Cai et al. (2004). However, the impact of trustworthiness is higher than that of perceived risk particularly in financial services even though financial services and payment transactions are perceived as higher risk areas (Roy & Shekhar, 2010) whilst innovative advantages of mobile banking reduce UK consumer perception of social and psychological risks (Lee, McGoldrick, Keeling & Doherty, 2003).

Consumers have an increased anxiety and perceived security risk with wireless networks as these are more vulnerable to security attacks and interceptions according to Crabbe, Standing, Standing and Karjaluoto (2009) although most consumers only perceive security from a subjective perspective (Eze, Gan, Ademu & Tella, 2008). Security risk is a critical concern for consumers in the context of electronic services (Lwin, Wirtz & Williams, 2007) although consumers have no previous experience with new electronic services or new mobile services (Bauer, Barnes, Reichardt & Neumann, 2005). Furthermore, mobile commerce solutions have created new security risks including theft and loss or damage to mobile devices (Hanafizadeh et al., 2014) and as a result consumers have different security perceptions of a mobile environment (Chari, Kermani, Smith & Tassiulas, 2000). Consumer risk assessment of privacy invasion for electronic services and mobile services is difficult compared to tangible products whilst electronic services and mobile services are perceived as a higher risk by consumers (Gefen et al., 2003).

In addition, financial transactions that require the transfer of information in a wireless environment expose consumers to a higher degree of security and privacy risks (Chong et al., 2012). Furthermore, mobile banking and mobile payments are recent phenomena with limited consumer experience and consumers assess perceived risk of a mobile environment based upon their experience of a wired environment (Kim et al., 2009). However, Xin et al., (2013) identify that consumers with mobile banking experience have a stronger intention towards mobile payments. Consumers also perceive that many mobile payment solutions are insecure with an increased risk whilst security levels that apply to mobile payments do not match the higher security standards required for EMV smart cards (Eze et al., 2008). Consumers also perceive online banking and mobile banking as high risk compared to traditional face to face banking (Koenig-Lewis et al., 2010). Mobile payments is a new phenomenon in the UK and has a higher perceived risk that includes loss of privacy, personal data, the payment transaction itself and the consumer's financial assets (Schierz et al., 2010). Consumers are unable to meaningfully assess and differentiate the various risks of online or mobile banking (Wolfenbarger & Gilly, 2003) as risk assessment is more difficult with very limited prior experience (Zhao, Hanmer-Lloyd, Ward & Goode, 2008), although

perceived risk negatively affects a consumer's intention to adopt mobile payments (Chen, 2008). Previous mobile payment research has shown that 73.5% of consumers have concerns on security and transaction risk due to the perceived greater risk of uncertainty and a loss of control with mobile payments (Lu et al., 2011; VocaLink, 2015b).

As a result, widespread adoption of mobile payments in the UK is dependent upon consumers understanding the benefits and advantages of mobile payments in order to assess whether the perceived benefits outweigh the perceived risks (Kim & Prabhakar, 2004; Meuter et al., 2000; Riggins et al., 1994).

4.8 Research Models

Each research model assesses consumer technology acceptance using a number of different variables based upon approximation perspectives that cannot be accurately measured. As a result, any research findings are inaccurate and only provide approximation perspectives (Arksey & Knight, 1999; Sarantakos, 2005) whilst "all models are wrong, but some are useful" according to Box and Draper (1987, p.424).

Research model complexity and goodness-fit along with the construct structure are assessed against the research focus (Myung, 2000; Nakamura & Walker, 1994) with a number of models deselected that are obviously poor whilst the remaining models are retained for further evaluation (Kadane & Lazar, 2003). The research aim is to evaluate UK consumer perceptions of, and intentions towards mobile payments which are a good predictor of behavioural intention (Jackson et al., 1997; Szajna, 1996). The key aspects of usefulness, ease of use, trust and risk within the cognitive and affective responses of human psychology are used to explore the relevance and applicability of the core research model that is selected.

A number of information systems models were assessed including the End-User Computing Satisfaction (EUCS) model that covers the cognitive response of ease of use as one of four constructs proposed by Doll and Torkzadeh (1988). The EUCS model explains the formation process of user satisfaction of an information system from both the expectation and desire perspectives and is a valid model to assess customer usage

of online banking services (Pikkarainen, Pikkarainen, Karjaluoto & Pahnla, 2006). In addition, ease of use and training is one of eight constructs in Task Technology Fit (TTF) model that is an information systems theory proposed by Goodhue and Thompson (1995) that assesses the alignment of an information system with the actual tasks to be undertaken. However, none of these information systems models adequately address the psychological aspects of exploring the focus of this research which explores UK consumer perceptions of mobile payments.

In addition, there are three predominant research models used to evaluate information technology adoption in a consumer environment according to Khalifa and Shen (2008) which are DOI proposed by Rogers (1983), Theory of Planned Behaviour (TPB) proposed by Ajzen (1991) and TAM proposed by Davis (1989). The DOI is a theory that uses innovation, communication, time and social system as aspects that influence consumer acceptance or rejection of technology adoption (Moore & Benbasat, 1995). However, some academic researchers suggest that the perceived innovation construct in DOI is an alternative to the various constructs used in TAM according to Lee, Hsieh and Hsu (2011). Different aspects of the TAM and DOI theories were integrated by Sigala, Airey, Jones and Lockwood (2000). However, this mobile payments research explores UK consumer perspectives of mobile payments that is one of the earlier aspects of the human psychology outcome chain (Fazio & Petty, 2008) with the resultant focus. The TPB is essentially an extension of the TRA proposed by Fishbein & Ajzen (1975) that includes measures of control belief and perceived behavioural control (Armitage & Conner, 2001). The key component of the TPB is behavioural intent that is a function of an individual's attitude toward the behaviour, the subjective norms surrounding the performance of the behaviour, and the individual's perception of the ease with which the behaviour can be performed on the cognitive aspects of human behaviour that the DOI model does not adequately address.

The ease of use construct appears in a number of research models that have a focus on information technology adoption including the TAM with a psychology foundation (Chau, 1996). The TAM has been used for a substantial amount of technology research with findings that support the robustness of this model across time, settings, populations and different Information Technologies (Venkatesh, 2006). Furthermore,

the TAM is empirically superior compared to TRA and TPB according to Yousafzai, Foxall, & Pallister (2010) although none of these models adequately address the psychological aspects of exploring UK consumer perceptions that is the focus of this research. However, the TAM uses three separate, but inter-related, aspects of human psychology and these are cognitive response, affective response and behavioural response as shown in Figure 8 - Technology Acceptance Model (TAM) below:

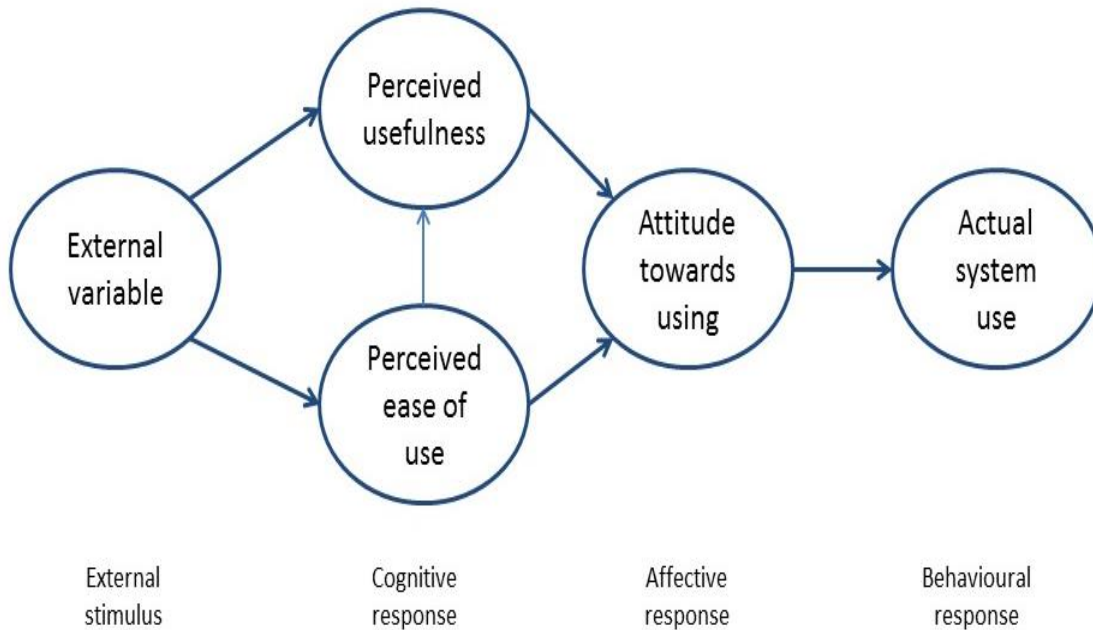


Figure 8 - Technology Acceptance Model (Davis, 1989)

A cognitive response is a thought generated in response to a persuasive communication (Petty & Cacioppo, 1996) that generates an attitude change which is determined by the way the individual manipulates, elaborates and integrates the information. The cognitive response is also influenced by the way an individual relates it to pre-existing thoughts that they have on the subject area (Greenwald, 1968). An affective response is the emotional reaction that is generated from a specific situation identified through a cognitive response and is an evaluative response that is not based upon simple knowledge as it includes feelings, preferences, intentions and favourable or unfavourable judgements (Lambin, 2007). An affective response is an umbrella term for a set of concepts that include emotions, moods, and feelings (Liljander & Mattsson, 2002; Russell 2003) that play an integral role in human motivation (Isen & Reeve, 2005) and influence reflexes, perceptions, cognition, social judgments, that impacts

behaviour (Forgas & George, 2001). A behavioural response derives from an affective response and includes the actions of an individual to the internal or external stimulus and represents the adoption of an information system (Davis, 1989).

The TAM theory suggests that an individual's attitude toward an information system is based on two primary antecedent variables which are perceived usefulness and perceived ease of use (Davis, 1989). The TAM theory also suggests that the external stimulus of system design is a determinant of the two cognitive responses of perceived ease of use and perceived usefulness although the external stimulus of system design originally applied to the adoption of information technology in a business context. In the TAM theory, perceived ease of use is a determinant of perceived usefulness whilst both perceived ease of use and perceived usefulness are determinants of an individual's attitude towards using an information system. An individual's attitude towards using an information system is an antecedent to the actual information system use by the individual. Whilst the TAM is used to determine an individual's interest in the initial technology adoption, perceived usefulness and technology satisfaction affect a consumer's continuing usage of the information system according to Zhou and Lu (2011). However, the relationship between the constructs in the TAM differ across cultures and these have been explained through Hofstede's (1984) four cultural dimensions of individualism-collectivism; uncertainty avoidance; power distance and masculinity-femininity (Straub et al., 1997) with technology characteristics playing an important role (Lederer, Maupin, Sena & Zhuang, 2000).

Whilst a number of researchers have integrated different aspects from separate theories that can sometimes produce an even stronger model than each separate individual model on its own (Gillenson & Sherrell, 2002) the TAM is an appropriate research model for exploring UK consumer perceptions and attitudes towards mobile payments. The use of the TAM for exploring consumer perspectives is valid despite the fact that the TAM was originally applied to technology adoption in a business context rather than a personal context (O'Cass and Fenech, 2003). In addition, the TAM explores the core psychological aspects associated with information technology adoption (Igarria, Schiffman & Wieckowski, 1994). The TAM is also a proven robust and effective model for evaluating information technology acceptance (Mathieson, 1991;

Taylor and Todd, 1995) when compared to the TRA and its successor, the TPB, whilst the TAM has a focus early in the human outcome chain and as a result is fully consistent with the focus of this research on UK consumer perceptions of mobile payments.

4.9 Conceptual Model

The TAM theory provides the foundation for the conceptual model that is used to explore UK consumer perceptions of mobile payments through the two key cognitive constructs of perceived ease of use and perceived usefulness. However, whilst the TAM has been successfully used in various consumer focussed mobile research (Pagani, 2004; Samtani, Tze, Hoon & Gin, 2003; Teo & Pok, 2003) the two cognitive response constructs of perceived ease of use and perceived usefulness are not sufficient to explain an individual's acceptance of technology (Mathieson, 1991). Information technology supports the consumer in making a mobile payment and as a result a consumer intention could be explained in part by the TAM (Pousttchi & Wiedemann, 2007). Furthermore, the core TAM framework has been validated for internet banking with additional constructs in order to obtain a clearer picture of consumer adoption (McKechnie, Winkhofer & Ennew, 2006). These additional constructs to the core TAM framework assist in creating a stronger research model (Legris et al., 2003) and improve the explanatory power of the research model that is used although these additional constructs are added carefully to ensure the resulting conceptual model is still based upon relevant theory and retains content validity (Gounaris & Koritos, 2008). Trust and risk constructs are added to the TAM model to form the conceptual model that is used in this research to explore UK consumer perceptions of mobile payments. The trust and risk constructs are adopted from Pavlou (2003) who added trust and risk constructs to the TAM to assess consumer acceptance of electronic commerce.

4.9.1 Personal Characteristics effect on Perceived Ease of Use

Perceived ease of use depends upon the extrinsic physical benefits generated by the use of technology (Kim, Chan & Gupta, 2007) and consumer perception of ease of use is a key influence in technology acceptance (Agarwal & Karahanna, 2000; Davis et al., 1989; Goo, Hyung & Law, 2008; Hendrickson et al., 1993; Lin & Wang, 2006; Lo, 2008). In addition, the perceived ease of use construct for mobile payment assessment has

been validated by Chen (2008) and Dahlberg et al. (2008) and is a significant smart phone mobile payment adoption driver (Chang et al., 2009). Personal characteristics that include perceptions of computers, the internet, smart phones and technology in general (Fain & Roberts, 1997) also influence consumer adoption (Kuisma et al., 2007; Srijumpa et al., 2002). The influential personal characteristics on perceived ease of use include technical competence according to Davis (1993) along with overcoming technical challenges (Dabholkar & Bagozzi, 2002). Social influences and personal traits are also important influences on consumer adoption of technology (Venkatesh et al., 2003; Wu & Lederer, 2009) and include the innovation perspective that is “an idea, practice, or object perceived as new by the individual” (Rogers & Shoemaker, 1971, p. 19). The identification of different personal characteristics that significantly influence consumer innovation adoption assists in understanding consumer interest in new technology such as mobile payments (Tabak & Barr, 1999). A large percentage of empirical research has failed to identify the relevance and importance of consumer personal characteristics such as consumer innovativeness on adoption (Gounaris & Koritos, 2008) although there are a few notable exceptions including Maenpaa, Kanto, Kuusela and Paul (2006). In addition, a range of demographic characteristics have been identified as influences on technology-based self-service adoption (Darian, 1987; Eastlick, 1993; Fram & Grady, 1997).

Educational background is an important influence on consumer technology adoption (Wejnert, 2002) as it reflects the individual skills, knowledge, and cognitive base. A higher education provides an increased knowledge base that is used to assess innovation adoption (Hambrick & Mason, 1984) although the education level of Malaysian consumers has no influence on attitude towards the use of a smart phone (Osman et al., 2011). Age is also an important personal characteristic that influences perceived ease of use in online shopping (Koufaris, 2002) and mobile wallet adoption (Shin, 2009). In addition, there is an increase in the use of online banking by younger consumers in Turkey (Calisir & Gumussoy, 2008) whilst German consumers aged 25 to 34 years old are particularly interested in the use of mobile phones for banking and shopping (Sraeel, 2006). Furthermore Yao and Zhong (2011) identify that a large

majority of Chinese mobile banking users are young people aged 18 to 34 years old whilst the percentage of middle-aged mobile banking users is very low.

According to Morris and Venkatesh (2000) and Morris, Venkatesh and Ackerman (2005) there is a negative relationship between age and intention to adopt new technology as younger people are usually early adopters of innovative technologies (Luo, 2009). However, Chung, Park, Wang, Fulk and McLaughlin (2010) identify that age is not an influence on perceived ease of use, perceived usefulness and intention to participate in online community web sites, whilst the predominant age range for Finnish mobile banking consumers is 30 to 49 years old (Laukkanen & Pasanen, 2008).

Both self-efficacy and facilitating conditions are influences on perceived ease-of-use (Khan & Craig-Lees, 2009) whilst self-efficacy has a positive effect on how an individual views perceived ease-of-use (Agarwal & Karahanna, 2000; Agarwal, Sambamurthy & Stair, 2000; Igbaria & Iivari, 1995; Venkatesh, 2000; Venkatesh & Davies, 2000; Wang et al., 2003). Personal self-efficacy is defined as a subjective belief that an individual has the capability to undertake an action using the information system based upon the ability to cope with the situations that arise (Compeau & Higgins, 1995; Venkatesh & Davies, 2000). However, Agarwal and Karahanna (2000) actually distinguish between general computer self-efficacy and application-specific self-efficacy and identify a stronger relationship between computer self-efficacy and perceived ease of use. Furthermore, a consumer with low self-efficacy of new technology is more resistant to adoption compared to a consumer with a high degree of self-efficacy (Ellen, Bearden & Sharma, 1991). In addition, high self-efficacy has a positive influence on perceived ease of use for Taiwan consumers and their intention to use mobile services (Luarn & Lin, 2005; Wang et al., 2003).

As a result of the above, the following research proposition is explored:

Research proposition 1. Personal characteristics have a positive effect on the perceived ease of use of mobile payments for UK consumers.

4.9.2 Personal Characteristics effect on Perceived Usefulness

Perceived usefulness is a key influence of an individual's acceptance of technology (Agarwal & Karahanna, 2000; Davis, Bagozzi et al., 1989; Goo et al., 2008; Hendrickson et al., 1993; Lin & Wang, 2006; Lo, 2008). In addition, the perceived usefulness construct has been validated with mobile payments by Chen (2008) and Dahlberg et al. (2008) although Kim et al. (2010) found that awareness of mobile payments has no influence on perceived usefulness with consumers in South Korea although awareness has a direct effect on perceived ease of use for early adopters.

Younger consumers have more interest in mobile services as shown by the substantial use of mobile telephones along with use of mobile phone services (Kleijnen et al., 2004) whilst there has been an increased use of online banking by younger consumers (Calisir & Gumussoy, 2008). Furthermore, German consumers aged 25 to 34 years old are particularly interested in the use of mobile phones for banking and shopping (Sraeel, 2006) as younger people are usually early adopters of innovative technologies (Luo, 2009). In addition, consumers who have positive beliefs on the compatibility of new technology are more likely to find mobile banking services useful (Koenig-Lewis et al., 2010) whilst the majority of Chinese mobile banking consumers are aged 18 to 34 years old and the percentage of middle-aged mobile banking users is very low (Yao & Zhong, 2011).

Previous research using the TAM shows that age is an important personal characteristic within the demographic variables and consistently validates that age is a moderator of a variety of construct relations including technology adoption (Venkatesh et al., 2003) online shopping (Koufaris, 2002) and mobile wallet adoption (Shin, 2009). Furthermore, the typical mobile banking consumer in Finland is aged between 30 and 49 years old whilst mobile banking usage is lower among those consumers aged under 30 years old and also those aged over 49 years old (Laukkanen & Pasanen, 2008). In addition, Venkatesh et al. (2003) identify that age is one of the most important demographic characteristics that influence consumer behaviour whilst Dahlberg and Oorni (2006) identify that age is a key influence in technology adoption for Finnish

consumers. However, Arvidsson (2014) found that age is not an influential characteristic with mobile payment consumers in Sweden.

As a result of the above, the following research proposition is explored:

Research proposition 2. Personal characteristics have a positive effect on the perceived usefulness of mobile payments for UK consumers.

4.9.3 Perceived Ease of Use effect on Perceived Usefulness

Perceived ease of use influences perceived usefulness in a mobile commerce environment whilst a consumer who perceives a mobile commerce system is easy to use will perceive the mobile commerce system to be more useful (Kleijnen et al., 2004). Perceived ease of use has been shown to influence perceived usefulness that indirectly influences attitude and consumer intention in a wide variety of areas including online banking, wireless communications and e-commerce (Al-Somali, Gholami & Clegg, 2009; Dautzenberg et al., 2008; Qiu & Li, 2008). Perceived ease of use is a key influence on perceived usefulness for internet banking by Spanish consumers (Aldas-Manzano, Lassala-Navarre, Ruiz-Mafe & Sanz-Blas, 2010); for internet banking consumers in Turkey (Ozdemir & Trott, 2009); and for mobile banking consumers in Taiwan (Luarn & Lin, 2005). In addition, perceived ease of use of a smart phone is an influence on perceived usefulness for employees at a Taiwan delivery service company whilst perceived ease of use of a smart phone has a larger influence on a consumer attitude (Chen, Chen & Yen, 2011).

The complexity of mobile payments using a mobile phone device frequently emerges as a barrier to adoption for consumers in Finland (Mallat, 2007) and results in consumer learning difficulties that have a detrimental impact on perceived ease of use and generates a negative consumer attitude towards the payment system (Chen & Adams, 2005). In addition, electronic payment systems and mobile banking that are complex to use also negatively influence attitude and results in slower adoption (Laukkanen & Lauronen, 2005). Furthermore, mobile payment system characteristics impact on perceived ease of use which affects subsequent consumer adoption intention (Kim et al., 2010) whilst the design characteristics exert immediate influence on perceived

usefulness (Davis, 1989). Understanding and improving the usability of smart phone devices with differing characteristics including screen size, screen resolution set-up and input methods has a positive effect on perceived ease of use and perceived usefulness (Lee & Benbasat, 2004).

Perceived ease of use is influenced by the ease of learning of a new electronic system that is important for consumer acceptance of mobile payments and is also an indirect influence through perceived usefulness (Pousttchi, 2003). A minimal consumer learning curve for mobile payments has a positive effect on perceived ease of use and perceived usefulness and can lead to widespread adoption with different mobile devices, diverse market segments and various cultures across multiple countries (Carr, 2007). Furthermore, whilst computer self-efficacy has a considerable influence on consumer intention to adopt internet banking, perceived ease of use only has an indirect effect on perceived usefulness of internet banking (Chan & Lu, 2004; Chau & Lai, 2003; Eriksson, Kerem & Nilsson, 2005; Suh & Han, 2002). In addition, perceived ease of use influences perceived usefulness for mobile technologies and mobile services directly and indirectly (Jarvenpaa et al., 2000; Nysveen et al., 2005; Teo and Pok, 2003).

As a result of the above, the following research proposition is explored:

Research proposition 3. Perceived ease of use has a positive effect on the perceived usefulness of mobile payments for UK consumers.

4.9.4 Perceived Trust effect on Perceived Usefulness

Trust is a key influence in consumer intention to use mobile payments (Shin, 2010) and has a much higher level of importance with consumer payments (Pousttchi, 2003; Zmijewska et al., 2004a). Consumer trust in a payment system is influenced by a variety of factors including anonymity, security, reliability, user control and the reputation of the payment systems organisation (Egger & Abrashevich, 2001). Mobile payments is a new phenomenon for the UK and as a result, consumers have no previous experience on which to assess trust (Bauer et al., 2005). However, a lack of trust in mobile payments is an obstacle to adoption and initial trust directly and indirectly affects

consumer intention to adopt mobile payments (Lu et al., 2011; Zhou, 2014). Furthermore, perceived trust has a direct effect on perceived usefulness in internet banking adoption for consumers in the UK and Saudi Arabia (Alsajjan & Dennis, 2010) whilst initial trust has a positive effect on perceived usefulness with consumer adoption of mobile banking in China (Zhou, 2011).

Consumer trust in an online transaction such as a mobile payment is influenced by perceived security as online transactions are subject to multiple security threats and risks (Chellappa & Pavlou, 2002). Security risk mitigation includes a structural assurance that only mobile payment transactions the consumer has undertaken are applied to their account (Akturan & Tezcan, 2012) which Laforet and Li (2005, p. 362) define as a “guarantee of safety of client’s funds”. Structural assurances include legal and technological structures, guarantees and regulations that protect consumers from fraudulent payment transactions and mitigate perceived security risks (Maroofi, Kahrarian & Dehghani, 2013; Zhou, 2011). The provision of structural assurances increases the trust in the organisation providing the guarantee which positively influences perceived usefulness of mobile banking for university based students in the USA (McKnight et al., 2002); positively influences mobile banking for consumers in China (Kim et al., 2009; Zhou, 2011) and also positively influences consumer interest in mobile payments (Dahlberg et al., 2003). In addition, structural assurance guarantees for mobile banking include the reliability of financial payment transactions, the protection of consumer privacy and transactional confidentiality which also improve the initial consumer confidence and trust (Kim et al., 2009). Furthermore, institutional-based trust through structural assurances has a positive effect on perceived usefulness and reduces perceived risk (Gu et al., 2009) whilst trust and credibility are crucial in reducing the overall perceived risk for mobile banking consumers in South Korea (Koenig-Lewis et al., 2010).

As identified earlier, trust is a key additional construct to the TAM and influences perceived usefulness in an e-commerce environment (Pavlou, 2003), whilst perceived usefulness is an influence on trust in other research (Suh & Han, 2002). Trust also influences behavioural intention through the affective response (Gefen & Straub, 2004; Kim & Prabhakar, 2004; Liu et al., 2005; Suh & Han, 2002; Wang & Benbasat, 2005).

Furthermore, perceived trust has been included as an additional construct to the TAM in various studies (Koenig-Lewis et al., 2010; Lee et al., 2007; Lu et al., 2011; Zhou & Lu, 2011). As a result, an additional construct of perceived trust affecting perceived usefulness is included in the conceptual model that is used for this research.

As a result of the above, the following research proposition is explored:

Research proposition 4. Perceived trust has a positive effect on the perceived usefulness of mobile payments for UK consumers.

4.9.5 Perceived Trust effect on Perceived Risk

Trust is one method used by consumers to address perceived risk and any related uncertainty that may arise (Gefen, 2000) whilst trust and risk are inter-related in a consumer's decision making process (Morrison & Firmstone, 2000). As identified in 4.9.4 above, numerous studies identify that perceived trust influences consumer attitude on mobile payments with perceived risk and perceived usefulness influenced by consumer perspectives of perceived trust.

Perceived trust in an organisation providing mobile payments is a key influence on successful adoption (Siau, Sheng, Nah & Davis, 2004; Xu & Gutierrez, 2006) and organisational trust relates to the various providers of mobile payments including banks, card companies, mobile operators and other service providers (Kim et al., 2010; Yousafzai et al., 2010). Organisational trust is an influence on mobile payment adoption with consumers in Sweden (Arvidsson, 2014) whilst perceived company reputation and customer-friendly products and services engender initial trust in an organisation (Koufaris & Hampton-Sosa, 2004) that offsets perceived risks.

One of the core functions of a bank is the effective transfer of money between two parties based upon their security advantages (Pousttchi, 2004) and covers subjective factors including consumer trust in banks and objective factors including fraud detection, credit assessment and claims management (Khodawandi et al., 2003). Perceived trust has a substantial influence on perceived risk with internet banking consumers in Austria (Grabner-Krauter & Faullant, 2008) whilst corporate image is a key influence with internet banking consumers in Spain (Flavian, Guinaliu & Torres,

2005). Furthermore, initial organisational trust substantially reduces the perception of risk with mobile banking by consumers in Korea (Kim et al. (2009) whilst initial organisation trust followed by channel trust mitigate the perception of risk with mobile banking consumers in Germany (Koenig-Lewis et al., 2010). Organisational trust reduces the perceived risk with internet banking consumers in Spain (Aldas-Manzano et al., 2010) whilst 50% of UK consumers are more likely to use mobile payments if it comes from a bank (VocaLink, 2015c). This is consistent with consumers in Finland who trust banks as providers for mobile payments first and large mobile network operators second whilst small MNOs and other small companies are not considered trustworthy with high risk (Dahlberg et al., 2003). In addition, Karnouskos, Hondroudaki, Vilmos and Csik (2004) identify that registration has negative trust influences on perceived risk when personal information is provided to a previously unknown organisation in order to register and use mobile payments.

Perceived trust has been included as an additional construct to the TAM in various studies (Koenig-Lewis et al., 2010; Lee et al., 2007; Lu et al., 2011; Zhou & Lu, 2011) and an additional construct of perceived trust as a determinant of perceived risk is included in the conceptual model that is used for this research.

As a result of the above, the following research proposition is explored:

Research proposition 5. Perceived trust of a bank by UK consumers will be higher than perceived trust of other mobile payment providers due to reduced perceived risk.

4.9.6 Perceived Risk effect on Perceived Usefulness

Consumer perception of risk is an important influence with new technology or a technology service (Laforet & Li, 2005; Yang, 2009) whilst mobile payments can be made through various consumer operated technology devices. Consumer interest in mobile payments is influenced by concerns and perceived risks of using technology (De Ruyter et al., 2000). However, consumers are unlikely to be able to assess the actual risks associated with the technology and as a result consumers make an assessment based upon risk perceptions (Frewer, Howard & Shepherd, 2011; Pavlou, 2003).

The key risks for mobile payments made through a smart phone include ease-of-use, convenience, security, privacy and reliability (Chang et al., 2009). However, consumers already using a technology enabled service have more confidence that the underlying information system is reliable and secure (Rotchanakitumnuai & Speece, 2003). The loss of privacy and personal data along with the payment transaction successfully completing increase the perceived risk for consumers and negatively influences perceived usefulness (Schierz et al., 2010). Perceived security risk is a dominant influence of consumer intention to adopt mobile payments whilst consumer intention increases with decreasing risk perceptions (Featherman & Pavlou, 2003; Kuisma et al., 2007; Milind, 1999; Yiu et al., 2007).

Perceived risk has been included as an additional construct to the TAM in various studies (Koenig-Lewis et al., 2010; Lee et al., 2007; Lu et al., 2011; Zhou & Lu, 2011) and an additional construct of perceived risk as a determinant of perceived usefulness is included in the conceptual model that is used for this research.

As a result of the above, the following research proposition is explored:

Research proposition 6. Perceived risk has a negative effect on the perceived usefulness of mobile payments for UK consumers.

4.9.7 Perceived Ease of Use effect on Attitude

Perceived ease of use has a substantial influence on consumer attitude towards using technology (Agarwal & Prasad, 1999; Davis et al., 1989; Hu et al., 1999; Jackson et al., 1997; Venkatesh, 2000; Venkatesh & Morris, 2000). Furthermore, a consumer's affective response on attitude to mobile payments is influenced by perceived ease of use and is a key construct of an individual's acceptance of technology (Agarwal & Karahanna, 2000; Davis et al., 1989; Goo et al., 2008; Hendrickson et al., 1993; Lin & Wang, 2006; Lo, 2008). Perceived ease of use has been validated as an influence on consumer attitude and subsequent adoption of technology including internet banking with consumers in Hong Kong (Cheng, Lam & Yeung, 2006; Yiu et al., 2007); internet banking with consumers in Taiwan (Lee, 2009; Wang, Wang, Lin & Tang, 2003); and consumer intention to continue using internet banking in Taiwan (Ho & Ko, 2008).

However, perceived ease of use only has an indirect effect on intention to adopt internet banking in research by Chan and Lu, 2004; Chau and Lai, 2003; Eriksson et al., 2005; and Suh and Han, 2002.

Perceived ease of use is an antecedent to attitude and has been validated with mobile payments (Chen, 2008; Dahlberg et al., 2008) whilst perceived ease of use is a major influence on attitude and adoption for consumers in Sweden (Arvidsson, 2014). However, perceived ease of use is only one of a number of important influences for mobile phone payment adoption according to Chang et al. (2009). Smart phones are complex technology devices that consumers adopt with no prior experience (Ondrus et al., 2005) although this lack of experience has not stopped rapid widespread adoption (IDC, 2015). However, smart phone consumer usage is limited to core functionality including phone calls and text messaging for Malaysian consumers whilst fully exploiting smart phone capabilities has yet to occur (Osman et al., 2011). Consumers who have prior mobile phone experience learn quickly which leads to a wider use of the numerous smart phone Apps (Kim, 2008). The attitude of medical doctors and nurses in the USA to smart phone usage is largely influenced by perceived usefulness which is a stronger influence than perceived ease of use (Park & Chen, 2007).

Mobile payment registration by consumers is an additional consumer activity that is inconvenient and detracts from perceived usefulness which has a negative effect on attitude (Dahlberg, Mallat & Oorni, 2003) which may be the reason for adoption failure of mobile phone based payments (Antovski & Gusev 2003; Dewan & Chen 2005; Ondrus & Pigneur, 2005; Pousttchi & Zenker 2003). Furthermore, Mallat (2007) suggests that a complex mobile payment registration procedure results in additional complexity that negatively influences consumer interest which is consistent with Viehland and Leong (2007) for consumers in New Zealand. However, Khodawandi et al. (2003) identified that mobile payment pre-registration is not a concern for consumers in Germany where a very small percentage of consumers indicate a lack of interest due to pre-registration requirements.

As a result of the above, the following research proposition is explored:

Research proposition 7. Perceived ease of use of mobile payments has a positive effect on UK consumer attitude.

4.9.8 Perceived Usefulness effect on Attitude

Perceived usefulness is a strong influence for male adoption of technology according to Rouibah (2009) and has a substantial effect on attitude and intention to adopt mobile phone banking for younger consumers in Germany (Koenig-Lewis et al., 2010). Perceived usefulness also affects consumer intention to use mobile banking dependent upon technology experience levels for consumers in Korea (Chung & Kwon, 2009). However, the effect of perceived usefulness on attitude is substantial in some research studies but not substantial in other studies according to Sun and Zhang (2006). Perceived usefulness does not influence attitude to smart phone applications for consumers in Finland (Verkasalo et al., 2010); nor does it influence attitude for mobile games (Ha, Yoon & Choi, 2007); and nor does it influence attitude for mobile Internet (Pedersen, 2005).

Consumers in the USA who use new technology are more likely to use electronic payments whilst payment instrument choice depends on the characteristics of the transaction although perceived usefulness of new technology has a positive influence on consume attitude (Hayashi & Klee, 2003). Transaction characteristics are a predominant factor in the choice of payment instrument used by consumers to make a payment (Hayashi & Klee, 2003; Humphrey et al., 2001) whilst the transaction value is one of the most important influences (Boeschoten, 1998). Transaction value has a substantial influence on the payment instrument used by consumers in France although cash is the preferred payment mechanism for 90% of transactions up to €5 (Bounie & Francois, 2006). However, speed of payment is a key influence on the consumer selection of the payment instrument at a retail store (Ching & Hayashi, 2010).

As a result of the above, the following research proposition is explored:

Research proposition 8. Perceived usefulness of mobile payments has a positive effect on UK consumer attitude.

4.9.9 Conceptual Model Justification

The behavioural response construct in the original TAM measures attitude towards using a system relative to actual system usage. However, as the mobile payments phenomenon is relatively recent (Diniz et al., 2011) and is new for UK consumers and is continually evolving (MasterCard, 2012a; VocaLink, 2013), this construct is excluded from the conceptual model used for this research.

The solid lines and arrows shown in the conceptual model diagram indicate the constructs and research propositions that have been explained above and are explored in this research. The constructs and research propositions are explored through the collection of empirical data and is fully justified as the mechanism through which the research objectives are addressed and the research statement explored. The conceptual model used in this research is shown in Figure 9 - Conceptual Model below:

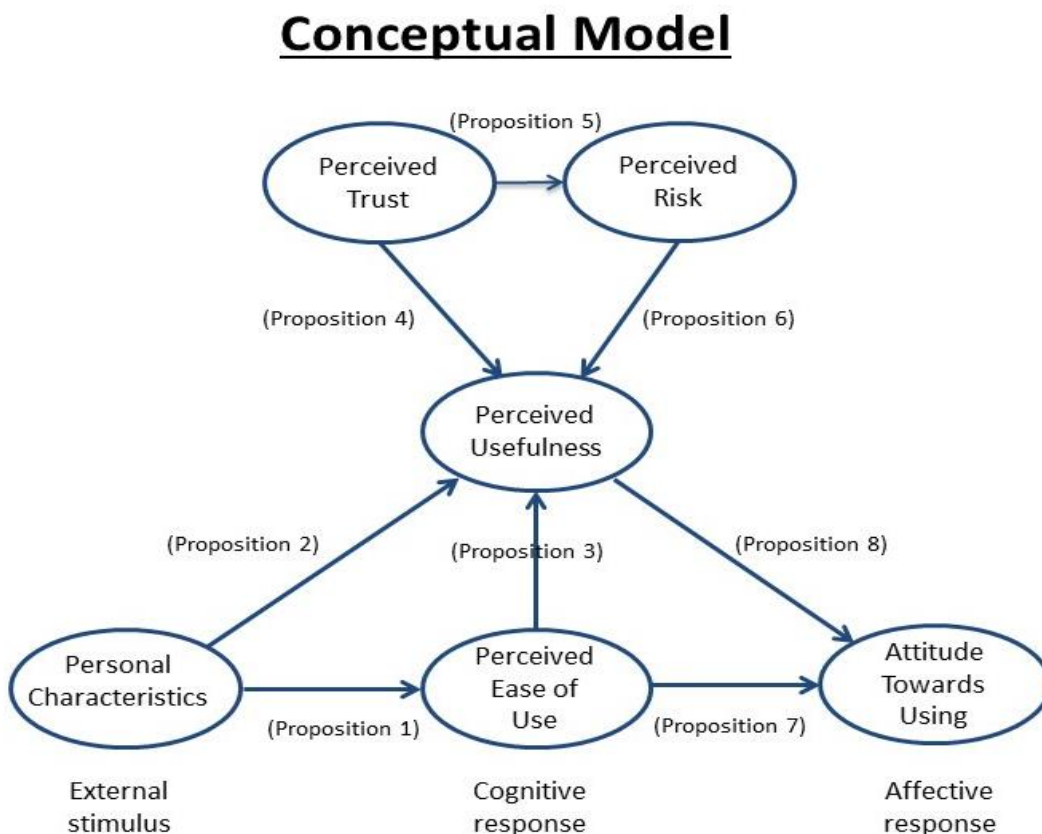


Figure 9 - Conceptual Model

Developed by C C Hampshire (2015) from Technology Acceptance Model (Davis, 1989)

4.10 Summary

This chapter explored consumer behaviour and the consumer choice of the payment instrument for making a financial exchange including consumer attitude, behaviour and consumption using the cognitive and affective responses within human psychology. Consumer willingness to obtain relevant knowledge in order to use self-service technology including mobile payments along with the impact of attitude and technology readiness of consumers to adopt self-service technology were then explored. The chapter then discussed consumer perceptions of electronic forms of money along with the relative advantage of payment instruments based upon different payment values. Consumer identification of the perceived benefits of the latest technology development in contactless EMV smart cards was then examined including relative advantage of mobile payments.

Consumer perceived usefulness and perceived ease of use of mobile payments and their impact on consumer attitude were then reviewed. This was followed by a review of consumer perceptions of trust and risk as these are influences on consumer attitude for mobile payments (Kuisma et al., 2007; Shin, 2010; Yan et al., 2009; Yiu et al., 2007). Various consumer research models were then reviewed before the research propositions were defined and justified followed by a review of the conceptual model that uses the core framework of the TAM.

The next chapter reviews and justifies the use of a post-positivist philosophy with a social constructionist ontology (Quinlan, 2011) which explores UK consumer perceptions of the mobile payments phenomenon within the social world (Easterby-Smith et al., 2012). This is followed by an explanation and justification for the inductive approach with empirical data collection using sequential mixed methods (Hussey & Hussey, 1997) using purposeful sampling (Marshall, 1996). The chapter goes on to explain and justify the research strategy and concludes with the identification of a number of limitations of the adopted methodology that include a subjective perspective as multiple versions of reality can be constructed (Cavana et al., 2000), although this does not negate the validity of the knowledge that is created (Arksey & Knight, 1999; Rubin & Rubin, 2012).

5 Research Philosophy, Strategy, Design and Administration

5.1 Introduction

In the previous chapter the research lens initially focussed on consumer payment behaviour and this was followed by a review of consumer perceptions before the research lens narrowed the focus on consumer perceptions of payment instruments. This was followed by a review of consumer perceptions of perceived usefulness and perceived ease of use that are two core constructs of the TAM (Davis, 1989). Consumer perceptions of trust and consumer perceptions of risk were then reviewed as these influence consumer attitude on mobile payments (Kuisma et al., 2007; Shin, 2010). The final section of the previous chapter explored various consumer psychology research models and justified the use of the core TAM framework from which the conceptual model was developed before defining and justifying the various research propositions that are explored. The chapter concluded by providing a justification for the conceptual model and how this is an effective approach for addressing the research objective.

This chapter explains this research within a post-positivist philosophy where the researcher is a learner as the mobile payments phenomenon is explored amongst the UK consumers that includes learning with them rather than conducting research on them (Wolcott, 1990). The alternative philosophical positions are then described along with supporting rationale for why these are regarded as inappropriate for exploring consumer payment behaviour. The chapter then goes on to identify four paradigms that are used for analysis of social theory (Burrell & Morgan, 1982) before providing an explanation and justification for the empirical research that is based upon the use of a sequential mixed methods research strategy to explore UK consumer perspectives of the mobile payments phenomenon within the UK payments market.

An explanation and justification is then provided for the research strategy that uses multiple methods to collect empirical UK consumer data followed by a review of other research strategy options and why these are regarded as unsuitable for this exploratory research. This is followed by a clear explanation of the administration processes that are followed before the data collection processes are detailed and justified. A number

of methodology limitations are then identified that include subjective interpretation (Denscombe, 2010) whilst acknowledging that alternative analysis may produce multiple and different versions of reality (Cavana et al., 2000). The chapter concludes by exploring the research ethics that apply to the separate consumer survey instruments, research instrument administration, data collection, data analysis and finally the reporting of the findings.

The key theoretical positions that this research takes is shown in Figure 10 - Research Philosophy, Strategy, Design and Administration Chapter Structure below:

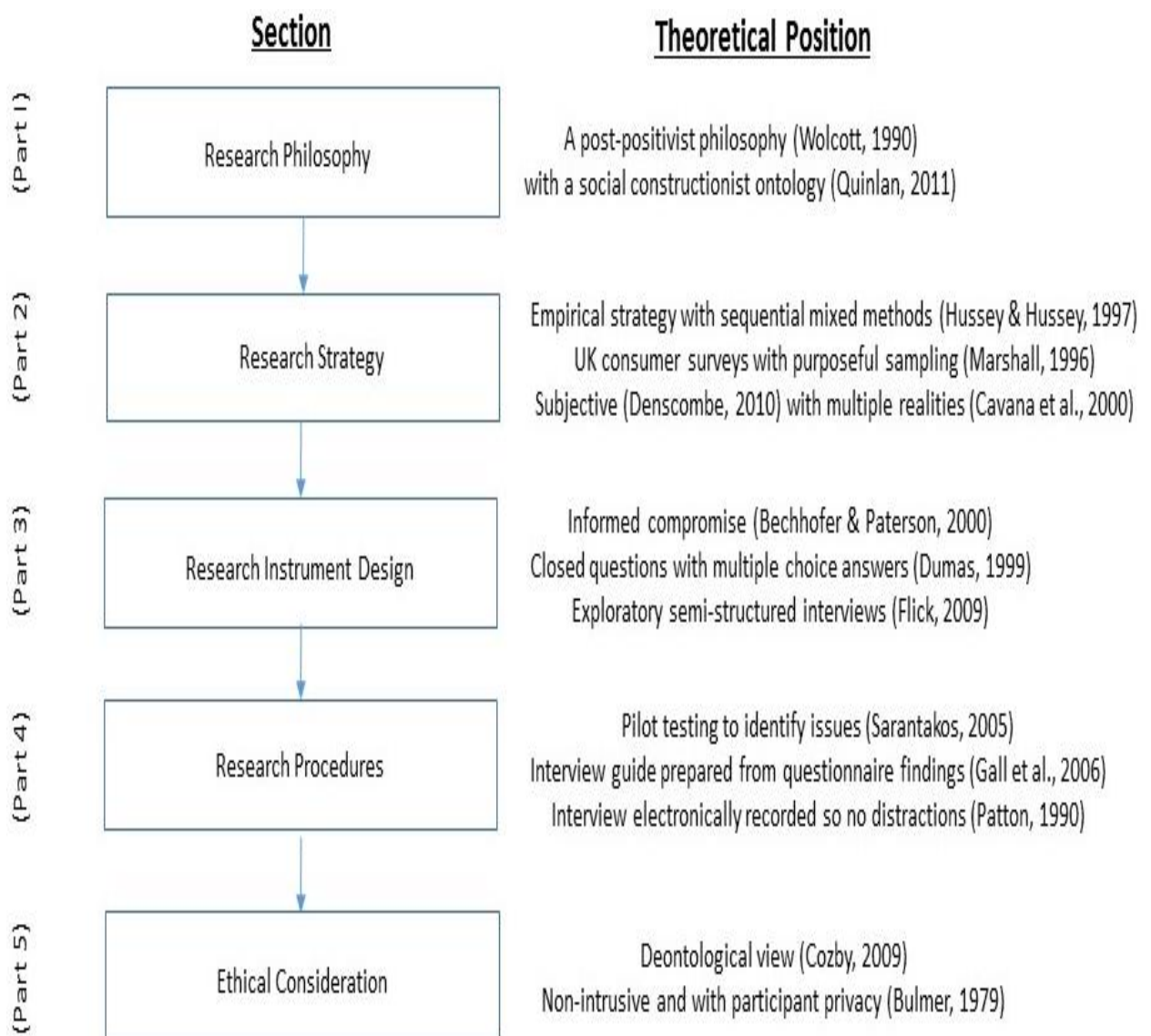


Figure 10 - Research Philosophy, Strategy, Design and Administration

Chapter Structure

5.2 Research Philosophical Position

The fundamental philosophies support the methodologies which emerge from the philosophies whilst the methodologies in turn support the data collection methods which emerge from the methodologies as shown in Figure 11 - The Methodological Pyramid below:

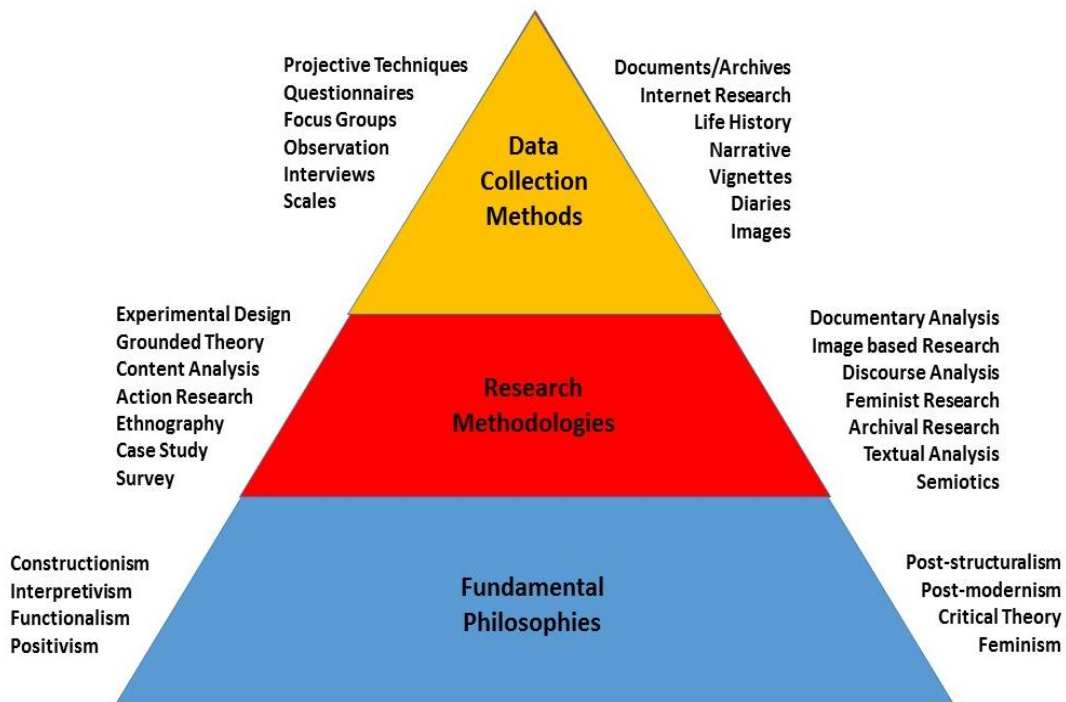


Figure 11 - The Methodological Pyramid

Developed by C C Hampshire (2015) from Quinlan (2011)

A post-positivist research philosophy is used for this social research (Cameron & Price, 2009; Easterby-Smith et al., 2012; Quinlan, 2011; Saunders et al., 2012) based upon a reflective epistemological position as the existing knowledge base foundation for generating future knowledge within a dichotomy framework. This is described by Johnson and Duberley (2000, p. 3) as the “study of criteria by which we can know what does and does not constitute warranted... knowledge” and provides the framework through which UK consumer perceptions of the mobile payments phenomenon are explored (Cooper, 2008; Fisher, 2010). However, the research findings are identified from the individual UK consumer perspectives that are determined by different life and situational experiences (Easterby-Smith et al., 2012). In addition, the UK consumer

payments knowledge identified is based upon an analysis of UK consumer perceptions that are formed from individual experiences inter-weaved with the research process (Kvale & Brinkmann, 2009).

The post-positivist philosophical position recognises that a phenomenon can exist independent of the perception as well as the theories that exist on the phenomenon (Phillips, 1987). The post-positivist philosophy is supported by a social constructionist ontology which acknowledges that individuals have their own thoughts and ideas and these form part of the exploration of UK consumer perceptions of the mobile payments phenomenon where social constructions are realised and treated as objectives in the social world (Quinlan, 2011). The social constructionist ontology is consistent with the post-positivist philosophical position as it emphasises both the patterned nature of the social construction process but also the regular predictable effects that make abstract concepts tangible and recognises that social constructions have an effect on action (Ryan, 2006).

A social constructionist ontology assumes that reality exists although it can only be known imperfectly and explored from a probability perspective (Robson & McCartan, 2016). As a result, any reality that is constructed is based upon existing knowledge and understanding that has been individually acquired and interpreted through separate context dependent experiences (Easterby-Smith et al., 2012). However, the use of narrative is an essential tool that is used to explain the findings from post-positivist research as the theoretical interpretation is balanced with the descriptive explanation (O'Donnell, 2004) and is achieved through a detailed explanation of the story including linguistic style and narrative exposition. The definitions and distinctions that support the research findings are explained in words and phrases that reproduce subjective interview narrative whilst a mix of concrete detail with analytic categories connects the familiar with the unfamiliar (O'Donnell, 2004). Narrative analysis is used on the words obtained from each interview as each conversation provides another understanding of the mobile payments phenomenon as understood and explained by each interviewee (Ryan, 2006).

UK consumer purchase behaviour is an ordinary life experience that includes the way each consumer interprets and understands the world through their personal experience (Tesch, 1990). UK consumer insights of the mobile payments phenomenon are explored based upon each individual's assessment and interpretation whilst these occur in a specific social context and at that point in time (Hackley, 2003). This social context continues to evolve and UK consumer perceptions of the mobile payments phenomenon also evolve as awareness and adoption increases. As a result, the research findings are context dependent at the date on which the empirical data is collected (Donmoyer, 2000) whilst the empirical data is shaped by the nature of realities encountered by each UK consumer (Crotty, 1998). The interpretation of the empirical data collected is a subjective assessment that is influenced by the researcher being an integral part of what is constructed (Horsburgh, 2003) with data interpretation based upon an analysis of the responses and not based upon fact (Davidson, 1989).

The version of reality that is created is socially constructed based upon how UK consumers make sense of the mobile payments phenomenon within their own world rather than seeking to describe an objective world (Stake, 1995) as reality does not have an objective pre-existence (Easterby-Smith et al. 2012). Furthermore, qualitative research is "studying things in their natural settings, attempting to makes sense of, or to interpret, phenomenon in terms of the meanings people bring to them" (Denzin & Lincoln, 2011, p. 3). The qualitative interview data that is collected is based upon the interpretations that both parties jointly and individually create (Alvesson & Skoldberg, 2009). As a result, the research findings are subjective within the research framework used which can lead to claims of bias and associated criticism (Becker, 2000).

Whilst this research is philosophically informed, it is how well the reflection of the philosophical choices is articulated which includes justification of the ontology and epistemology positions compared to the other alternative choices (Johnson & Clark, 2006; Saunders et al., 2012). An unbiased and fully descriptive account is provided of the research methods and the research processes used to ensure that the research results can be fully assessed (Alvesson & Skoldberg, 2009; Bentz & Shapiro, 1998; Bold, 2012; Ritchie & Lewis, 2003).

Other philosophical positions include Interpretivism, Realism and Pragmatism according to Saunders et al. (2012). Interpretivism holds that all knowledge is a matter of interpretation where humans need to understand the differences in roles as social actors. Realism is a scientific enquiry philosophy that is based upon reality having an existence that is independent of the human mind and as a result is unsuitable for this research as consumer cognitive and affective responses are an integral part of human decision making and cannot be observed whilst Pragmatism asserts that concepts are only relevant where they support action (Kelemen & Rumens, 2008). As a result, these alternative philosophical positions are unsuitable for this research as exploring perceptions related to consumer purchase behaviour is not action based.

When considering the philosophical justification, Burrell and Morgan (1982) identify four paradigms of Radical Humanist, Radical Structuralist, Interpretive and Functionalist that summarise the epistemology and ontology aspects that apply to the analysis of social theory. This is based upon subjectivist to objectivist ontology perspectives in the horizontal axis with radical change to regulation axiological perspectives in the vertical axis as shown in Figure 12 - Paradigms for the Analysis of Social Theory below:

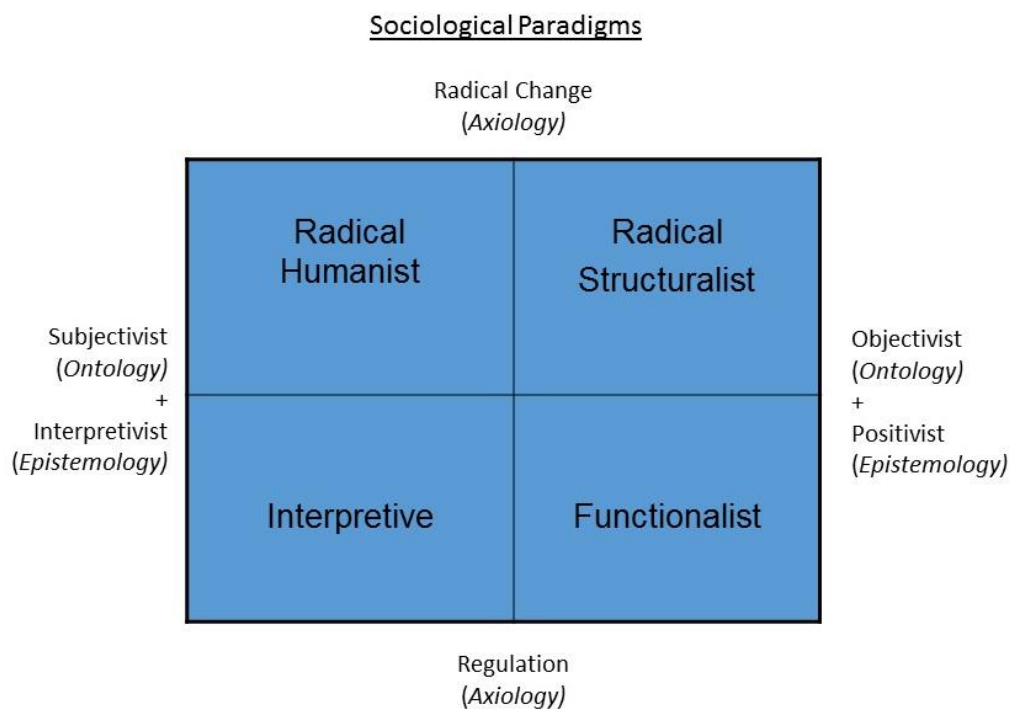


Figure 12 - Paradigms for the Analysis of Social Theory

Adapted from Burrell and Morgan (1982)

This research explores UK consumer perceptions in order to research the phenomenon in depth and with sophistication but without a statistically secure universalization of the findings that limits their generalisation (Hackley, 2003; Huberman & Miles, 2002). UK consumer purchase behaviour related to the mobile payments phenomenon is explored through an evaluation of cognitive and affective responses within human psychology which are based upon perceived usefulness, perceived ease of use, perceived trust and perceived risk. The use of an exploratory epistemology provides a rich and insightful analysis within each individual's social context (Ritchie & Lewis, 2003). The use of an exploratory epistemology is particularly appropriate for exploring UK consumer purchase behaviour as it provides "an accessible, flexible researcher and participant-friendly method for exploring the experiences of individuals and groups" (Thorpe & Holt, 2008, p. 116).

Empirical information is obtained from UK consumers on their perspectives of the mobile payments phenomenon through a jointly constructed sense of reality that Thorpe and Holt (2008, p. 115) describe as "individuals' personal perceptions... of phenomenon... the researcher attempting to get close to the participants personal world". The mobile payments knowledge that is created is based upon an understanding of the UK consumer perceptions through the use of two consumer survey instruments with small research samples. However, a social constructionist ontology is not determined by regularities that hold law-like properties but is used to understand a subjective and socially constructed world (Hackley, 2003; O'Leary, 2004; Quinlan, 2011; Sarantakos, 2005; Saunders et al., 2012). As a result, the research findings are based upon one interpreted meaning of the research data whilst different interpretations may actually provide a more accurate assessment (Simons, 2009).

There is no attempt to extrapolate these findings into a wider context but emphasis is placed on the trustworthiness of the research which is provided through transparency (Lincoln & Guba, 1985). This transparency includes the values and pre-conceptions of the researcher (Heron, 1996; Stake, 1995), the interactions of the researcher with the participants (Bold, 2012; Dick, 2004; Phoenix, 1994) and how interpretation of the data is undertaken (Riessman, 2008; Watson, 1994). As a result, the use of a social constructionist ontology within a post-positivist philosophy is justified for this research.

When considering the research approach, it is recognised that understanding social phenomenon is a complex activity whilst the use of sequential mixed methods supports the deeper and broader understanding of UK consumer viewpoints as it produces findings that reflect a wider range of interests and perspectives (Greene & Curucelli, 1997). Sequential mixed methods are used to explore UK consumer perspectives of the mobile payments phenomenon in the local UK payments market whilst the empirical strategy obtains up to date UK consumer data (Hussey & Hussey, 1997). The use of sequential mixed methods research goes beyond pure description in order to provide an analysis of the UK environment based upon substantial attention to rich and intricate detail (Bryman, 1992) although Bryman and Bell (2011) suggest that qualitative research has a monopoly on the ability to study consumer meaning. The use of sequential mixed methods research is an effective research approach that explores UK consumer cultural perspectives of the mobile payments phenomenon through the collection of empirical UK consumer data that is analysed to produce the research findings (Denscombe, 2010; Hussey & Hussey, 1997).

The use of a questionnaire as a quantitative research instrument is a reliable way to obtain consumer data (Hayes, 1998) which is statistically analysed to find out more about UK consumer perceptions of mobile payments as a new phenomenon that Patton (1987, p. 37) describes as “pre-evaluation work”. In addition, the concept of experimental evaluation as part of sequential mixed methods research is supported by a number of researchers (Miles, Huberman & Saldana, 2014; Rutman, 1980; Silverman, 2013). The consumer questionnaire is used as the first research instrument as this is effective when there is a clear and narrow research focus and there is clarity on the type of information needed (Denscombe, 2010). The use of a consumer questionnaire produces current, rich and subjective empirical data on UK consumer perspectives of mobile payments (Hussey & Hussey, 1997; Smith, Flowers & Larkin, 2009). Numerical analysis is undertaken on the empirical questionnaire data to identify recurring themes that are subsequently used to support the qualitative semi-structured interviews that are used as the second research instrument (Silverman, 1993).

The development and testing of research propositions outside of quantitative research has been successfully undertaken by various researchers (Lowe, Lynch & Lowe, 2014;

Walton & Hume, 2011) with a pragmatic approach taken to any conflicting paradigms (Patton, 1988). However, the use of two separate consumer survey instruments is a research design strength that provides a comparative aspect that validates the research findings (Webb et al., 2000) and is a more effective approach (Patton, 1988). Furthermore, the use of a quantitative data collection method followed by a qualitative data collection method is complementary as the data collection methods support each other (Field, 2013). In addition, previous research based upon a social constructionist ontology has used a quantitative method as part of data gathering process (Hackley, 2003).

The use of qualitative interviews explores the social world of mobile payments based upon human culture and behaviour of UK consumers (Bryman, 1992). Each interview is followed by an initial narrative data analysis that identifies key themes that are explored in subsequent interviews (Gerson & Horowitz, 2002). The semi-structured interviews are informal and allow a flexible approach that is open to change and adaption based upon the evolving nature of the phenomenon as it deals with the living world (Robson & Foster, 1989) and produces reality that is subjective, constructed and diverse (Sarantakos, 2005).

The research objective is not to make sense of general laws but attempts to discover what people think (Arksey & Knight, 1999) using investigation rather than experimentation (Silverman, 2010). This is fully consistent with the use of an inductive approach where theory is developed from the analysis of the empirical data (Saunders et al., 2012). Furthermore, a clear definitive description is provided for each part of the research approach as this increases the validity of the research findings (Morse, Swanson & Kuzel, 2001).

5.3 Research Strategy

Rich empirical data is obtained from the UK consumer surveys (Hussey & Hussey, 1997) with a questionnaire used as the first research instrument followed by semi-structured interviews which provides a comparative perspective between the data obtained from these two research instruments (Gelo, Braakmann & Benetka, 2008; Webb et al.,

2000). Exploring UK consumer perspectives of the mobile payments phenomenon has a narrow data collection focus which is based upon existing knowledge that was identified in Asian and Nordic cultures on this phenomenon and includes the type of information required. As a result, the use of two consumer surveys is a valid and justified research strategy (Denscombe, 2010).

Purposeful sampling is used (Marshall, 1996) that includes directing the consumer questionnaire to those consumers with a technology and mobile payments interest undertaken in the summer of 2014. The mobile payment group on the social networking site LinkedIn is used as group members support activities such as mobile payment questionnaires (Stets & Burke, 2000) but also consumers with a technology interest through Facebook that is another social networking site. In addition, other consumers are selected to complete the questionnaire in a face to face environment in areas around Chester in the same time period in order to obtain the views of consumers who do not use electronic channels. This research strategy supports the potential to reach UK consumers from diverse backgrounds and to obtain a broad spectrum of empirical data with a variety of life experiences (Hackley, 2003; Payne & Payne, 2004). Analysis of the questionnaire data identifies key consumer perspectives that are used to shape the approach to the subsequent semi-structured interviews which assists in validating any links between the questionnaire findings and interview findings (Arksey & Knight, 1999).

A sequential mixed methods research strategy is used to explore the research propositions identified earlier whilst quantitative data from the questionnaire helps to numerically scope the UK consumer perspectives. The subsequent qualitative data obtained from the interviews supplements the quantitative data (Miles et al., 2014) whilst the UK consumer cognitive and affective responses on the mobile payments phenomenon cannot actually be detected and as a result, any cause and effect can only be subjectively assessed (Ritchie & Lewis, 2003).

Following numerical analysis of the questionnaire data a small number of consumer interviews are undertaken that explore in depth each UK participant's perceptions of the mobile payments phenomenon using an exploratory approach (Hackley, 2003). An

initial narrative data analysis is undertaken after each interview to identify any key themes that are used to scope the approach to subsequent interviews (Gerson & Horowitz, 2002). Each interview is recorded with the participant's prior agreement so that the researcher can focus on managing the interview situation without the distraction of taking copious notes (Cohen & Crabtree, 2006; Davies & Hughes, 2014). The semi-structured interview guide included as Appendix C is used as this provides a framework that allows focus on the data that is being conveyed through verbal and non-verbal communication (Fielding & Thomas, 2008). Each interview focuses specifically on the participant's subjective perceptions of the mobile payments phenomenon with the researcher predominantly listening, responding to, and interpreting the verbal exchange (Flick, 2009).

Both the questionnaire and the interviews are contrived situations that are a form of communication which is open to interpretation and does not directly produce new research findings as facts are not collected (Silverman, 1993). However, interpretation of the quantitative questionnaire data and the qualitative interview data produces new UK consumer purchase behaviour knowledge on the mobile payments phenomenon (Kelly, 2008). In addition, whilst each interview is solely a conversation that is a basic human mode of interaction (Kvale & Brinkmann, 2009) it is the process through which social reality of mobile payments is constructed and shared between each participant and the researcher (Simons, 2009). A low inference descriptor strategy is used in each interview to increase the validity of the research findings consistent with each participant's account (Johnson, 1997). As a result, the use of sequential mixed methods research using a questionnaire as the first research instrument followed by semi-structured interviews as the second instrument is a fully justified research strategy that addresses the research objectives.

Other research strategies include Experimentation, Archival Research, Case Study, Ethnography, Action Research, Grounded Theory and Narrative Enquiry (Saunders et al., 2012). However, none of these are suitable for this empirical mobile payments research which explores UK consumer cognitive and affective response behaviour in human psychology. Experimentation is an unsuitable strategy for this research as it assesses the probability of a change in an independent variable on a dependent

variable which does not exist in exploring mobile payment consumer behaviour. Archival research is an unsuitable strategy for this research as it uses administrative records and documents as the principal source of data which is inconsistent with the collection of empirical UK consumer data. Case study research is an unsuitable strategy for this research as it is based upon observation and analysis whereas UK consumer cognitive and affective response behaviour cannot be observed and rationally analysed. Ethnography is an unsuitable strategy for this research as it studies groups of people whereas this research explores individual UK consumer cognitive and affective response within human psychology. Action research is an unsuitable strategy for this research as it an emergent iterative purpose of enquiry that seeks to develop solutions to a problem through taking action and assessing that action which is inconsistent with this research that explores individual UK consumer cognitive and affective response within human psychology. Grounded theory is an unsuitable strategy for this research as it is based upon the collection and analysis of data simultaneously with a constant comparison process that cannot be used as this research does not use a comparative enquiry approach. Narrative enquiry is an unsuitable strategy for this research as it is a personal account of an event or sequence of events which does not apply to this mobile payments research which explores UK consumer perceptions which explores individual consumer cognitive and affective responses relative to the mobile payments phenomenon.

The selected paradigm and methodology justification is based upon an exploratory epistemology as the situated cognition, complexity and change are pervasive whilst normal features covering irregular and changing phenomenon can increase reliability (Arksey & Knight, 1999). In addition, social science continues to develop and change whilst individual societies also change in different ways (McQueen & Knussen, 2002) which is demonstrated by the continually evolving mobile payments phenomenon (MasterCard, 2012a; MasterCard, 2014; Vocalink, 2013). Furthermore, mixed methods research is effective at exploring influences that can be too complex for structured research methods (Ritchie & Lewis, 2003). The use of mixed methods research, as part of a post-positivist philosophy, allows sense to be made of the subjective and socially constructed meanings of the UK consumer data obtained (Denzin & Lincoln, 2011).

However, the personality of the researcher is an integral part of the research instruments used within this particular paradigm (Gummesson, 2000). This mixed methods research uses diverse enquiry to produce both quantitative data from the questionnaire responses along with qualitative data based upon words obtained through purposeful sampling with an emergent and flexible interview design using a semi-structured method (Miles et al., 2014). The questionnaire research findings together with the interview research findings are based upon the interpretation of consumer data that is fully consistent with an exploratory paradigm which looks at how individuals make sense of the world (Bryman, 2012).

An exploratory epistemology is used within a socially constructionist ontology to guide the strategy based upon a flexible research designs and mixed methods research (Sarantakos, 2005). Mobile payments is a relatively new UK phenomenon with a large degree of the unknown and as a result a flexible and adaptable interview research design is used that is open to evolving concepts and themes (Layder, 1993). This research design is supported by Janesick (2010, p. 384) who suggests that researchers should have “open but not empty minds”. Furthermore, consistency between the philosophical starting point and the research methods used produces findings that have more validity (Morse et al., 2001) and as a result, the selected paradigm and methodology are fully justified.

Whilst considering the adopted methodology limitations, it is recognised that a social constructionist ontology is subjective as it involves real world circumstances and researcher involvement (Denscombe, 2010) that results in various influences and limitations which affect all aspects of this mobile payments research. The influences and limitations apply to questionnaire subjectivity, interpretation of the data, subsequent data analysis as well as the identification of the research findings (Quinlan, 2011). In addition, interview findings that arise from the qualitative data are subjective, value-laden and include bias based upon an ad-hoc process that accepts multiple realities (Cavana et al., 2000; Cresswell, 1994; Neuman, 1997). However, human understanding can never be objective as it is mediated through social context (Hackley, 2003). Furthermore, independent objective research does not exist as the researcher’s own individual perspectives influence the social research that is undertaken. As a

result, the new UK consumer mobile payments knowledge created is only one vision that is viewed through the researcher's personal perspectives (Richardson, 1992).

The researcher is an integral part of the mobile payments social world that is explored where consumers build their understanding and meaning through sifting prior experiences including biases (Rubin & Rubin, 2012). The use of an Exploratory paradigm influences what is obtained based upon each individual consumer's assessment of the world around them, how the encounter is evaluated and what meaning and value is allocated to each particular situation (Bryman, 2012). Each individual UK consumer evaluates the mobile payments phenomenon through their own personal perspective which leads to different views and conclusions. The empirical data that is collected is only an explanation of how each UK consumer makes sense of the mobile payments phenomenon at that moment in time and in that specific context and situation. In addition, the qualitative interview data may be interpreted in different ways with resultant variations in the research findings (Arksey & Knight, 1999). As a result, the new consumer purchase behaviour knowledge of the mobile payments phenomenon that is identified has little meaning outside of this setting (Czarniawska, 2004). However, an exploratory paradigm accepts that each individual's view of the phenomenon is valid despite the resultant multiple and potentially conflicting versions of reality that can arise (Rubin & Rubin, 2012).

The questionnaire research strategy is based upon UK consumers providing responses to all the statements or questions which limits both the number that can be included as well as the type of questions asked and answer options provided (Saunders et al., 2012). The inclusion of too many statements and questions results in too long a time that consumers are prepared to allocate which results in incomplete questionnaires and limited data available for analysis (Groves, Cialdini & Couper, 1992). In addition, the specific statements and questions asked including the words used and the answer options provided are pre-determined by the researcher which also limits the data collected (McKenna & Bull, 1999). A number of answer options are based upon a six point Likert scale that is a personal judgment measuring instrument (McIver & Carmines, 1981) which assesses the strength of agreement or disagreement to each statement (Bryman, 2012; Saunders et al., 2012) and is an effective method of

determining the strength of a consumer's perspective. However, a limited number of consumers actually complete the questionnaire over the timeframe allocated despite further requests for more responses.

A subsequent small number of purposeful semi-structured interviews are undertaken which means that the new knowledge created has a limited application to the wider community although this was never the intention (Ritchie, Lewis & Elam, 2003). Purposeful sampling is used for interviewee selection although this is a subjective judgement that balances practical concerns related to time, money and access with the research focus and the degree to which generalisation of the research findings is required (Arksey & Knight, 1999). The use of an exploratory approach with semi-structured interviews as a research methodology is based upon co-production between each participant and the researcher (Mason, 2002b). As a result, the research findings are limited by each interview context situation whilst the qualitative data that is collected from the semi-structured interviews is based upon a social interaction that includes bias (Rubin & Rubin, 2012).

Furthermore, the theoretical orientation of this mobile payments research is also determined by how the interview topic is explored, what assumptions are made on the possible answers, listening to the answers and the knowledge that is created from interpreting the answer which further limits the research findings (May, 2001). Striving to be as objective and neutral as possible in the collection, interpretation and presentation of both the quantitative questionnaire data and qualitative interview data is a key feature although this aspiration can never be fully attained (Richardson, 1992). The background and beliefs of the researcher are an influence although using a reflective approach assists in maintaining objectivity and neutrality whilst mitigating any bias (Snape & Spencer, 2003). The process used for this research is fully and clearly explained along with the supporting evidence in order to improve research reliability (Hammersley & Atkinson, 2007; Holloway & Wheeler, 1996; Morse et al., 2001).

5.4 Research Instrument Design

The mobile payments research is conducted systematically, carefully and from a theoretically informed intellectual basis in order to strengthen the validity of the research findings (Hackley, 2003). Empirical data is collected from which the research findings on UK consumer perceptions of mobile payments are identified (Ragin, 1994) and these are based upon an “informed compromise” research design (Bechhofer & Paterson, 2000, p. 71). Reliability of the findings is also achieved through reducing and minimising bias and avoiding improvisation in the planning and execution of this research (Arksey & Knight, 1999). The use of two separate consumer survey research instruments is both valid and appropriate for obtaining empirical data on UK consumer perceptions of mobile payments and provides a firm basis for validation of the research results and subsequent research findings (Webb et al., 2000).

An exploratory paradigm is used for the research design, data collection and data analysis which cannot be neatly and precisely described like the counterpart of quantitative research (Punch, 2013). Furthermore, the research design is just one part of the wider research process that is both interactive and iterative (Berg & Lune, 2011) based upon the use of a consumer questionnaire as the first instrument which produces a range of consumer perspectives, albeit these perspectives are limited by the questions asked and answer options provided (McKenna & Bull, 1999). Different numerical data analysis are undertaken on the questionnaire data in order to identify the key consumer perspectives that are then explored in depth in the subsequent semi-structured interviews which Lewis (2003, p. 49) describes as “theory and data collection informing each other”. The exploratory research design that is used supports the exploratory epistemology on which this research is based as this works best with a small number of cases where breadth is surrendered for depth (Silverman, 2010). A mixture of quantitative and qualitative data is obtained that relate to consumer perspectives of the various research propositions that are explored (Miles & Huberman, 1994).

Two consumer survey instruments are used which is a practical approach (Churchill & Iacobucci, 2010) to obtaining empirical data on UK consumer perspectives related to

the mobile payments phenomenon (O'Leary, 2004). However, the concept of measuring perceptions is both complex and difficult (Hackley, 2003) whilst the type of data collected determines the choice of survey data analysis (Fink, 2009). A questionnaire is used as the first research instrument (Appendix A) as it facilitates a broad approach to researching the mobile payments phenomenon with a large number of UK participants (Quinlan, 2011). The use of a consumer survey is a common research instrument (Bradburn, Sudman & Wansink, 2004) that is an appropriate and effective method of gathering empirical data on a clear and narrowly focussed research objective that is consistent with the objective of this research (Denscombe, 2010). As a result, the use of a questionnaire as a consumer survey instrument to explore UK consumer perceptions of mobile payments is a valid and justified approach. However, a flexible research design is used as the findings obtained from the questionnaire influence the subsequent interview approach (Sarantakos, 2005). The numerical analysis of the questionnaire data produces insights into UK consumer perspectives of the mobile payments phenomenon and these insights are used to establish the semi-structured approach that is used in the subsequent interviews. In addition, an initial analysis of each interview is also undertaken immediately after each interview so that any key findings can be identified and used to improve the focus of subsequent interviews (Rubin & Rubin, 2012).

Different UK consumer engagement channels are used as part of the research design to obtain questionnaire responses from a variety of UK consumers. The choice of engagement channels are influenced by time, cost and effort and the various trade-off decisions that related to convenience and the data quality required (Johns, 2011). However, there are clear indications that online electronic research is preferred by some consumers in today's society (Dillman, 2007; Truell, Bartlett & Alexander, 2002). Participant interest in the type of survey, as well as the nature of the targeted population segments affect response rates but can also produce bias through the consumer engagement channels used (May, 2001).

A face to face questionnaire survey is initially conducted with consumers at locations around Chester (UK) to obtain data on mobile payments from those consumers who may not use electronic channels. In addition, an electronic questionnaire completion

request is provided to individual consumers registered on mobile payment groups on LinkedIn in order to reach a wide range of consumers (Dillman, 2007). An electronic questionnaire completion request is also provided on Facebook in order to reach those consumers who have internet access but are less likely to use the specialist mobile payment groups on LinkedIn. In the early internet days of electronic surveys a disproportionate number of online individuals were high income professionals or those involved in higher education Kenway (1996). However, demographic disparities have been significantly diminished as the internet has become widely adopted across the UK (Coomber, 1997) and as a result, 20 million households (83%) have internet access and 42.4 million UK adults (86%) have used the internet according to Office for National Statistics (ONS, 2013).

A face to face interview design is used as the second consumer survey instrument as this allows each interviewee to express their own personal feelings and perspectives on the mobile phone phenomenon with “time to think in comfort” (Robson & Foster, p. 53). An exploratory interview design is also used as this allows the interviewee to talk freely about their cognitive, affective and behavioural thoughts and ideas that relate directly to the mobile payments phenomenon where “respondents ... express their own thoughts in their own words” (Miller & Brewer, 2003, p.166). In addition, the interview research design also explores the various constructs identified in the conceptual model (Oppenheim, 1992). The use of interviews as the second research instrument is an appropriate and effective method for gathering qualitative data on UK consumer perspectives of the mobile payments phenomenon (Patton, 1988) as it explores the world of human beliefs (Arksey & Knight, 1999).

The use of two separate independent consumer research instruments produces results based upon different sources of data that validate the research findings (Webb et al., 2000) and enhance the accuracy of the findings based upon multiple viewpoints (Creswell 2014). Furthermore, the use of two independent research instruments produces convergent data validity that reduces interpretation uncertainty (Webb, Campbell, Schwartz & Sechrest, 1966) but also makes the findings more persuasive (Hackley, 2003). As a result, the use of consumer surveys is a valid and justified research design for exploring UK consumer perceptions of the mobile payments phenomenon.

5.4.1 Questionnaire Design

The research statement and the research objectives guide the questionnaire production that explores various UK consumer perceptions of mobile payments as consumer intentions have been identified as a predictor of subsequent technology adoption (Jackson, Chow & Leitch, 1997; Szajna, 1996). However, consumer technology assessment is a highly complex activity (Ondrus & Pigneur, 2005) whilst measuring consumer perceptions is both complex and difficult (Hackley, 2003).

The questions included in the questionnaire are phrased so that they can be easily understood by all participants with a consistent meaning (Foddy (2001) whilst the questionnaire design follows the nine key steps identified by Stone (1993) and as shown in Figure 13 - Questionnaire Design Steps below:

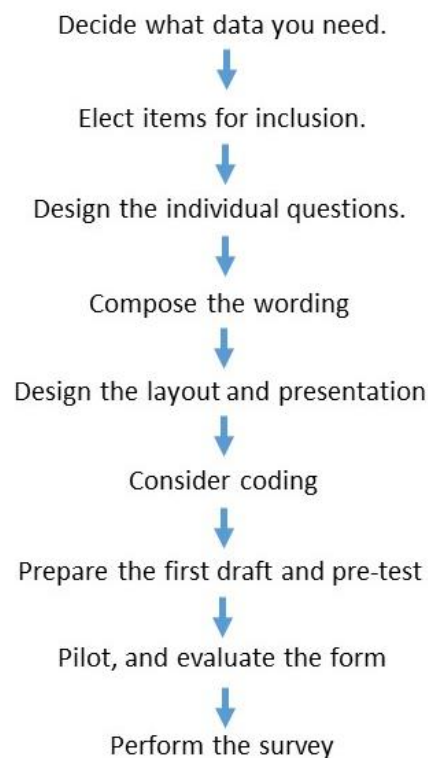


Figure 13 - Questionnaire Design Steps (Stone, 1993)

This approach to questionnaire design ensures that the questionnaire is developed and operated effectively and comparable answers are obtained (Payne, 1980). Furthermore, unambiguous questions are asked (May, 2001) as this determines the data that is obtained and from which consumer perspectives of the mobile payments

phenomenon are assessed (Bryman & Teevan, 2005). The questions are listed in a logical order with a smooth transition from each construct in the conceptual model (May, 2001). However, three questions on a mobile phone handset are placed together with the first question ascertaining whether the respondent has a mobile phone to avoid questions that are inappropriate for respondents who do not have a mobile phone handset. In the paper version of the questionnaire the branching instruction is positioned immediately adjacent to the answer box in order to maximise the respondents acting on this instruction (Redline & Dillman, 2002) whilst the electronic version provides an automated approach. In addition, the three mobile phone questions are included part way through the questionnaire so that the mobile phone handset is not suggested or implied to respondents when they answer the prior questions. Furthermore, respondent attribute questions are included at the end of the questionnaire as this increases the chance of questionnaire completion (Taylor-Powell, 1998).

Questions are included that relate to each proposition identified in the conceptual model although the majority of the questions are adapted from previous mobile payments research (Bryman, 2012; Saunders et al., 2012) as this is an effective approach to ensure that the empirical data addresses the research objectives. The willingness of each participant to spend time providing the answers and the length of time the questionnaire takes to complete are key factors that affect the number and completeness of the responses that are received (Groves et al., 1992). The original questionnaire design included five or six questions for each proposition within the conceptual model that produced a total of fifty questions and required over 20 minutes to complete. However, as limited time is available with each respondent to complete the questionnaire (Bordens & Abbott, 2010) a revised questionnaire design is used that restricts the number of questions to two or three questions for each research proposition despite the reduced value of the research findings as a consequence (Ritchie et al., 2003). A subjective selection process is used that identifies those questions that are more effective at addressing the research objective whilst providing validity for each research proposition. This questionnaire design results in twenty four questions being included in the final questionnaire along with three generic questions

on gender, age and education. However, it is recognised that alternative questions could have been chosen or the actual question used could have been asked in a different way and this may have produced different results (Dillman, 2007).

The questionnaire design is based upon the use of common English language words; simple but specific and single statements to avoid ambiguity and questions that are easy to assess and answer (Krosnick & Presser, 2010). Consistency in question form is also used along with consistent question design and answer options that improve the regularity of understanding whilst minimising the time required to complete the questionnaire. Closed questions with consistent multiple choice answers are used which provides a subject-centred response that assesses participant opinion that is fully consistent with the research objectives (Dumas, 1999; May, 2001). In addition, consistent and repetitive multiple choice answers are used to ensure a degree of consistency as this provides reliability of the results (Silverman, 1993). Different question styles are used occasionally to avoid participant boredom whilst answer variation mitigates repetitive answer syndrome (Denscombe, 2010). In addition, one question requires respondents to enter a numeric value that is the maximum amount or upper limit that the respondent would choose for a mobile payment.

The questionnaire design uses a Likert attitude scale with linear multiple choice answers (Dillman, 2007) that is a personal judgment measuring instrument (McIver & Carmines, 1981). A Likert scale is used to explore the strength of agreement or disagreement to each statement (Bryman, 2012; Saunders et al., 2012). However, the answers only reflect the perception of truth based upon the feelings of the respondent at that moment in time (Dyer, 1995). The majority of the answer options use a six-point attitude scale with polar opposites of strongly agree through to strongly disagree with consistency in response answer direction across all the questions (Bryman, 2012). The use of a six point scale produces good answer reliability compared to other scales (Tittle & Hill, 1967) as increasing the number of answer options provides minimal increased answer reliability (Lozano, Garcia-Cueto & Muniz, 2008). In addition, more complex scoring methods have shown to possess no advantage (Arksey & Knight, 1999). The six-point answer response scale is presented as a series of boxes with descriptions which increases construct validity with less response clustering (Weng, 2004) whilst a larger

choice of answers makes the respondent selection increasingly difficult (Cameron & Price, 2009). An even number of answer options is chosen so that each respondent has to commit to either a positive or negative perspective. However, the answer response options provide no metric or interval measure other than a range of narratives from strongly agree through to strongly disagree that respondents may interpret as evenly-spaced points on a scale (Johns, 2011). As a result, the findings have a weak reliability of the assessment scores although the answers are effective and reliable when used for a generic comparison of responses (Oppenheim, 1992).

The questionnaire layout, structure and content are designed to work in a mixed-mode environment supporting both paper and electronic questionnaire versions using a respondent-friendly design (Dillman, Tortora & Bowker, 1998). The questionnaire design that is used mitigates the four potential sources of error identified by Groves (1989) that are coverage, sampling, measurement and non-response. In addition, the design of the electronic questionnaire follows the principles proposed by Dillman (2007) and Dillman et al. (1998) that includes a web page design that works consistently on different consumer electronic devices. However, the electronic questionnaire survey includes two additional questions in order to ensure only UK consumer perceptions are obtained together with the electronic data source (LinkedIn or Facebook). Furthermore, the questionnaire design is also based upon transferring the consumer data into Microsoft's Excel spreadsheet application as this provides the foundation to establish linkages, model and graph the results (Bazeley & Jackson, 2013).

However, the use of electronic questionnaires can exacerbate the problem of not knowing who is actually responding because of the propensity of some internet users to assume an online identity (Couper, 2004), although the use of an electronic questionnaire can increase response rates when compared to other types of survey administration (Frankfort-Nachmias & Nachmias, 1996; Yun & Trombo, 2000). In addition, an electronic questionnaire method is a valid option for research that targets specific and narrowly defined populations with easy access to the world-wide web which includes mobile payment groups on LinkedIn and Facebook (Schmidt, 1997).

5.4.2 Research Proposition Questions

A number of questions are asked that relate to each of the individual research propositions identified in the conceptual model. Each individual question included in the questionnaire is critically reviewed against the research objective and the research proposition and each question is individually identified and justified below.

When considering the effect of personal characteristics on perceived ease of use as research proposition one, four statements are included in the questionnaire:

- I find my personal computer (PC), laptop computer or tablet computer easy to use.
- I find my mobile phone technology easy to use.
- I find a smart phone easy to use.
- I find Internet banking easy to use.

The 1st statement 'I find my personal computer (PC), laptop computer or tablet computer easy to use' explores a broader range of consumer technology devices and is a variation on previous research statements that have been used and validated including Lassar, Manolis and Lassar (2005) and Thornton and White (2001). However, Lee et al. (2011) use this statement but assess the respondent view from the opposite perspective through the use of the word 'complex' instead of 'easy to use'.

It is believed that the 2nd statement 'I find my mobile phone technology easy to use' has not been used previously but is a variation on previous research statements that have been used and validated by Kim et al. (2004); Wu and Wang (2005); and Zhou (2014).

The 3rd statement 'I find a smart phone easy to use' has been used and validated in previous research statements by Choudrie et al. (2014); Park and Chen (2007); and Tsai and Ho (2013). This statement is also a variation on broadly similar research statements that have been used and validated by other researchers including Khalifa and Shen (2008); Koenig-Lewis et al. (2010); Riquelme and Rios (2010); and Schierz et al. (2010).


The 4th statement 'I find Internet banking easy to use' has been used and validated in previous research statements by Chau and Lai (2003); Curran and Meuter (2005); Ho and Ko (2008); and Kim et al. (2010). This statement is also a variation on broadly similar statements that have been used and validated by Cheng et al. (2006) and Lee (2009).

When considering the effect of personal characteristics on perceived usefulness as research proposition two, it is recognised that awareness is a pre-requisite to adoption (Claudy, Michelsen, O'Driscoll & Mullen, 2010; Howcroft, Hamilton & Hewer, 2002) and three statements are included in the questionnaire:

- I have heard of mobile wallets.
- I have heard of contactless payment cards.
- I have seen the following symbol in a retail store in the UK e.g. M&S, WH Smiths

or Post Office



Both the first statement 'I have heard of mobile wallets' and the second statement 'I have heard of contactless payment cards' are minor adaptations of previous awareness research statements that have been used and validated in different context situations by Al-Somali et al. (2009); Pikkarainen et al. (2004); and Yousafzai et al. (2003). It is believed that the 3rd statement 'I have seen the following symbol in a retail store in the UK e.g. M&S, WH Smiths or Post Office'  has not been used previously.

When considering the effect of perceived ease of use on perceived usefulness as research proposition three, two statements are included in the questionnaire:

- I believe that learning how to make a mobile payment will be easy for me.
- I anticipate making a mobile payment will be easy.

The 1st statement 'I believe that learning how to make a mobile payment will be easy for me' is a minor variation on previous research statements that have been used and validated including Chandra et al. (2010); Kim et al. (2010); Leong et al. (2013); Slade et al. (2014); and Tan et al. (2014). In addition, this 1st statement is also a variation on broadly similar research statements that have been used and validated including Gu et al. (2009); Koenig-Lewis et al. (2010); and Lin (2011).

The 2nd statement 'I anticipate making a mobile payment will be easy' has been used and validated in previous research statements including Chandra et al. (2010); Kim et al. (2010); Leong et al. (2013); Schierz et al. (2010); Slade et al. (2014); and Tan et al. (2014).

When considering the effect of trust on perceived usefulness as research proposition four, two statements are included in the questionnaire:

- I would trust that my personal information is safe (meaning secure and confidential) when making a mobile payment.
- I would trust mobile payments if a guarantee was provided that only payments made by me result in monies being taken from my account.

The 1st statement 'I would trust that my personal information is safe (meaning secure and confidential) when making a mobile payment' is a variation on previous research statements that have been used and validated including Chandra et al. (2010); Koenig-Lewis et al. (2010); Lu et al. (2011); Wang and Lin (2008); and Yang et al. (2012).

The 2nd statement 'I would trust mobile payments if a guarantee was provided that only payments made by me result in monies being taken from my account' is a variation on previous research statements that have been used and validated including Chandra et al. (2010); Kim et al. (2009); and Kim et al. (2010).

When considering the effect of perceived trust on perceived risk as research proposition five, three statements are included in the questionnaire:

- I would trust a mobile payment service provided by a UK bank e.g. Barclays Bank or Royal Bank of Scotland.
- I would trust a mobile payment service provided by my mobile network operator e.g. Orange, Vodaphone, EE or O2.
- I would trust a mobile payment service provided by companies other than a bank or mobile network operator e.g. PayPal or Google.

All three statements on trust of a mobile payment provider are a variation on previous research statements that have been used and validated including Abrazhevich (2001); Arvidsson (2014); Koenig-Lewis et al. (2010); and Pousttchi and Wiedemann (2007).

When considering the effect of perceived risk on perceived usefulness as research proposition six, two statements are included in the questionnaire:

- I believe that using a contactless card to make a payment has risks.
- I believe that using a mobile phone to make a payment has risks.

The 1st statement 'I believe that using a contactless card to make a payment has risks' is a minor variation on previous research statements that have been used and validated by Wang and Lin (2008) and Yang (2005).

The 2nd statement 'I believe that using a mobile phone to make a payment has risks' is a minor variation on previous research statements that have been used and validated by Wu and Wang (2005) and Riquelme and Rios (2010). In addition this 2nd statement is also a variation on broadly similar research statements that have been used and validated by Chong et al. (2012); Lu et al. (2011); and Slade et al. (2014).

When considering the effect of perceived ease of use on attitude as research proposition seven, two statements are included in the questionnaire:

- If I have to register for a mobile payment service this would reduce my interest in mobile payments.
- I find the following facilities easy to use on my mobile phone.....

The 1st statement 'If I have to register for a mobile payment service this would reduce my interest in mobile payments' is a variation on previous research that has been used and validated by Viehland and Leong (2007) and Khodawandi et al. (2003).

The 2nd statement 'I find the following facilities easy to use on my mobile phone' is a variation on previous research statements that have been used and validated by Chin, Felt, Sekar and Wagner (2012) and Choudrie et al. (2014).

When considering the effect of perceived usefulness on attitude as research proposition eight, three statements are included in the questionnaire:

- A mobile payment will be of interest to me if faster than other types of payment.
- I would find a mobile payment useful if it means avoiding queues to pay.
- I would make a mobile payment up to a maximum amount of £.

The 1st statement 'A mobile payment will be of interest to me if faster than other types of payment' is a variation on previous research statements that have been used and validated including Chandra et al. (2010); Kim et al (2010); Swilley (2010); Wang and Lin (2008); and Zhou, Lu and Wang (2010).

The 2nd statement 'I would find a mobile payment useful if it means avoiding queues to pay' is a variation on previous research that has been used and validated by Sripalawat, Thongmak, and Ngramyarn (2011).

It is believed that the 3rd statement 'I would make a mobile payment up to a maximum amount of £x' has not been explored in previous research. This statement is used to explore the consumer appetite for risk related to the mobile payment transaction value although Matinmikko and Abrahamsson (2006) suggest micro-payments have a value of €1 to €10.

5.4.3 Interview Design

The interview research lens is adopted according to the emerging themes obtained from the questionnaire analysis and results in the interview guide being produced (Silverman, 2009). A semi-structured interview guide is used to explore the mobile payments phenomenon with minimal intervention or leading by the researcher (Fielding & Thomas, 2008; Flick, 2009) and is included as Appendix C. The semi-structured interview guide has 4 sections with the 1st section providing an introduction and context. The 2nd section requests some demographic information from the interview whilst the 3rd section explores the mobile payments phenomenon in details with a concluding 'thank you' as section 4 which is consistent with the interview design guide suggested by Bryman (2012).

Each interview is a contrived situation that does not directly produce new findings as no facts are collected whilst any findings are indirectly produced through subjective interpretation of the data (Silverman, 1993). However, new UK consumer knowledge is created from the analysis of the questionnaire data together with the interview data based upon a subjective interpretation, although it is recognised that different subjective analysis could produce variations in the research findings (Arksey & Knight, 1999; Kelly, 2008).

An exploratory interview design is used as this produces data from which substantial meaning and understanding are created (Carson, Gilmore, Perry & Gronhaug, 2005). Exploratory interviews are used with questions of an investigative nature as this provides a flexible design that leads to a discovery of the unexpected or even to reveal the unknown (Gerson & Horowitz, 2002). Different types of interview questions are asked that relate to the mobile payments phenomenon to encourage participants to provide complete answers (Kvale, 1996; Rubin & Rubin, 2012), although the data that is obtained cannot be directly observed (Patton, 2002). In addition, each interviewee is encouraged to provide information in as accurate and complete manner as possible that Kvale (1996, p.3) describes as “interviewer as miner”. Furthermore, careful listening is undertaken on the verbal response provided by each interviewee so that any subsequent knowledge that is created is based solely upon interpretation of the answers provided (Mason, 2002b).

A collaborative interview supports the sharing of reflection and enquiry (Douglass & Moustakas, 1985) whilst exploring in-depth the meaning and language (Legard, Keegan & Ward, 2003). An informal interview approach is used in order to establish rapport and gain trust which creates a more natural environment that is conducive to open and honest communication (O’Leary, 2004) whilst prompts and probes are used to encourage elaboration of the participant’s response (Sarantakos, 2005). A three stage questioning process is adopted as this provides structure to the interview with strategic questions asked first. The use of strategic questions first opens avenues for further subsequent exploratory questions (Charmaz & Belgrave, 2012; Peavey, 2003) followed by detailed questions related to the constructs in the conceptual model and finally a conclusion.

A neutral presence is maintained, although this is more difficult when there is a perceived social imbalance, and as a result, a purposeful sampling selection process is used to minimise any imbalance (Oakley, 1981). The interviewer impact is also minimised through a semi-structured approach (Fielding & Thomas, 2001; Minichiello, Aroni, Timewell & Alexander, 1990) as this produces data on which an objective analysis is undertaken (Pole & Lampard, 2002). An interview guide is prepared that includes an outline agenda of the topics to be covered (Kvale & Brinkmann, 2009) as this provides flexibility to steer the discussion although the guide is not an exact prescription for conducting the interview itself (Burgess, 1984). The use of a flexible interview design also allows the initial interview research topics to be modified dependent upon relevance and importance of the knowledge that is identified as each separate interview progresses (Bryman & Teevan, 2005). Each interview explores the key themes that are identified from the questionnaire data and previous interview data and is used to obtain detailed interviewee perspectives that relate to the research propositions which is an effective and justified interview design (Wengraf, 2001).

Interview narratives are used to understand the feelings and perceptions of each interviewee that relate to the mobile payment phenomenon and are based upon the social reality that is created through the selection and linking of events into a meaningful personal situation (Ricoeur, 1981). An analytical interview design process is followed where the interview data content is analysed in order to identify any comparable and contrasting themes (Carson et al., 2005; Miles et al., 2014).

Informed consent can transform a passive participant into an active participant (Alderson, 1995), although informed consent requires a written and signed contract that can create the wrong perspective and may have an adverse impact on the subsequent interview (Singer, 1978). Exploring UK consumer perceptions of the mobile payments phenomenon is not a highly sensitive subject, and as a result, a signed contract is deemed inappropriate and inferred consent is used for each interview. The the range of different aspects of participant consent (Saunders et al., 2012) are shown in Figure 14 - The Consent Continuum below:

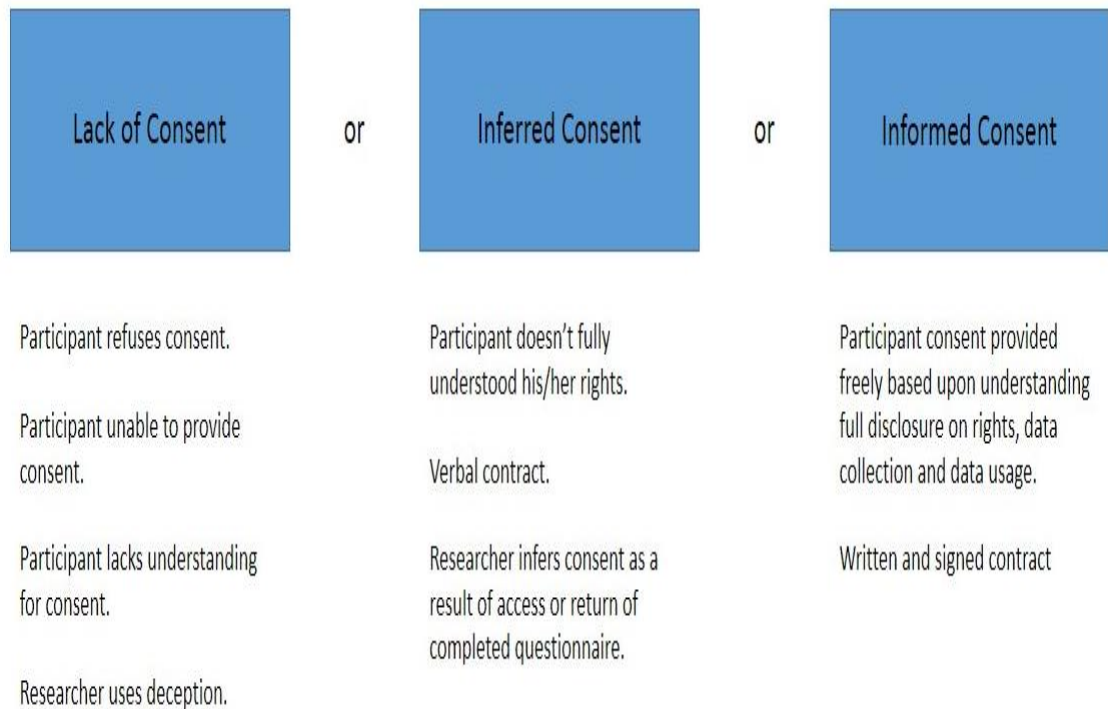


Figure 14 - The Consent Continuum

Developed by C C Hampshire (2015) from Saunders, Lewis and Thornhill (2012)

However, each interview uses language to express perceptions, ideas or thoughts where the actual meaning is dependent upon the existing social convention and context (Berger, 2010). The data collected from each interview is based upon words and language that is interpreted by reference to concepts of social theory where meaning is based upon the actual context (Halliday, 2009). In addition, there is no single interpretation of the spoken words obtained in each interview (Huberman & Miles, 2002) as any interpretation of the data is subjective (Fielding & Fielding, 1986). As a result, the research findings created from the interpretation of the complex interplay of words and codes are dependent upon the social convention in operation (Chandler, 2007). The data from each interview is analysed prior to the next interview with emerging themes related to the research propositions explored in subsequent interviews (Loftland & Loftland, 1995). In addition, consumer perceptions require an assessment of codes and signs that include language (Chandler, 2007) although “all perceptual systems are already languages in their own right” according to Jameson (1972, p.152).

Content analysis is used to explore each interview that is undertaken although any derived meaning is dependent upon the social context within which each interview occurs (Silverman, 2013). Content analysis is an accepted methodology that is used to apply order to the interview data as it seeks to classify previously categories identified from the questionnaire data analysis using a systematic approach (Bryman & Bell, 2007). Content analysis aims to uncover the identification of meaning from each participants' subjective explanation and interpretation of the verbal interchange and the actual words used (Bailey, 2008). However, any data interpretation depends upon how the messages are presented, the interaction of these messages and any influence that the interviewee's thoughts and feelings may have (DeVito, 2013; Luckmann & Berger, 1991). Furthermore, interpretation of the interview data is also influenced by the concepts that the researcher already holds (Hall, 2012) and together with the use of an inductive approach means that the interview data analysis may be based upon pre-conceived ideas (Charmaz & Belgrave, 2012; Strauss & Corbin, 1990). Furthermore, as the research strategy explores UK consumer perceptions of the mobile payments phenomenon, the identification of any conversation issues such as how participants use pauses or other visual signs are not relevant to the nature of this research enquiry.

The interviews are recorded and the spoken words are subsequently captured electronically using Microsoft Word. The interview data is translated into a format that is suitable for classification and ordering (Strauss & Corbin, 1990) and subsequent analysis (Rose & Sullivan, 1996) through the application of codes and themes whilst the process is clearly explained as this establishes the basis for the validity and reliability of the research findings (Flick, 2011; Hammersley & Atkinson, 2007). Whilst any findings are context dependent with a number of diverse interpretations possible, these are minimised through the use of a semi-structured interview approach (Arksey & Knight, 1999).

A transcript of the interview is subsequently printed on paper so that coding of the actual spoken words used by each interviewee can be undertaken (Flick, 2009). Text-based analytics are used on the interview data (Bryman, 2012) using a content analysis framework (Halliday, 2009) although this is a judgemental activity (Robson & Foster, 1989). The text content and structural elements of the interview data are reviewed in

order to identify key themes relevant to the research propositions being explored; both within the data but also across the various interviews (Mello, 2002). The content data analysis of the interview narrative identifies the various descriptive categories that are compared and cross-checked with the other interviews (Flick, 2009; Patton, 1990) with similar words or phrases grouped into the same category (Brown, 1996). This analysis process is defined as “recurrent and distinctive features of participants' accounts characterizing particular perceptions” according to King and Horrocks (2010, p. 150).

However, content analysis is predicated on the basis that the interview is structured as a sequence, the interview interaction reflects the context within which it occurs, and that all data is relevant (Silverman, 2004). Whilst Berg and Lune (2011) identify 3 stages to content analysis that are preparation, organisation and reporting, Miles and Huberman (1994) suggest 3 stages to content analysis that are data collection, data reduction and conclusions. However, whilst the stages identified provide a formal structure on which to base the analysis, the analytical process is not linear as data reduction is not a separate activity to data analysis but an integral part of it as it selects, simplifies and transforms the data. Furthermore, coding is not simply part of data analysis but is the essential relationship between data and theory (Strauss & Corbin, 1990).

Coding is an iterative process that organises the data into categories that subsequently leads to the construction of descriptions and the identification of theory (Berg & Lune, 2011). This iterative process involves breaking down the data, undertaking data comparisons with other data through the organisation of the interview data into categories. The data that is identified as similar is placed in the same categories whilst different data creates new categories as this provides a framework from which patterns in the data are identified (Charmaz & Belgrave, 2012).

5.5 Research Procedures

When considering the administration of the research instruments, the research procedures are clearly specified in order to demonstrate research reliability and

validity (Kvale & Brinkmann, 2009) and to clearly show the process through which the research findings are constructed (Riessman, 2008; Watson, 1994).

Pilot testing of the questionnaire research instrument, data collection and data analysis is undertaken with a small number of participants in order to identify any weakness that need to be resolved prior to using the research instruments on a broader scale (van Teijlingen & Hundley, 2001). In addition, the pilot questionnaire testing is also used to validate the questionnaire wording, sequence, consumer understanding and time taken to complete the questionnaire prior to full roll out which minimises any information distortion that may occur (Dunsmuir & Williams, 1991; Oppenheim, 1992). Pilot testing also allows identification and resolution of any mechanical issues in the administration of the research instrument (Sarantakos, 2005).

A limited number of UK consumer perspectives are explored rather than a whole community, and as a result, research replication is not possible (Sarantakos, 2005). Furthermore, purposeful sampling is used for both the questionnaire and interviews (Burgess, 1984; Maxwell, 2012) as the participants are chosen according to ease of access that includes distribution channels (Ritchie et al., 2003). However, the purposeful sample chosen is representative rather than random to increase the reliability of the research findings (Hackley, 2003) and is achieved with the questionnaire completed by consumers in a face to face situation around the Chester area; consumers who are members of mobile payment groups on LinkedIn and consumers who use Facebook as a social network. In addition, a purposeful interview sample is achieved through the selection of individuals known to the researcher. This purposeful sampling approach provides a variety of participants from diverse backgrounds that produces a broad spectrum of data (Payne & Payne, 2004) although the findings are not representative of the phenomenon in the wider population (Ritchie et al., 2003).

When considering the questionnaire administration, the questionnaire is initially administered using face to face interviews at locations around the Chester area using a clear, standardised and concise approach whilst maintaining a rapport with the participant (Fowler, 2002). This approach increases the reliability of the findings as

each participant responds to the same question in the same sequence and as a result all responses are comparable with other completed questionnaires (Dunsmuir & Williams, 1991). The data captured from the face to face interviews is then transferred into a Microsoft Excel spreadsheet as this supports the analysis of the captured data (Bazeley & Jackson, 2013; Bryman & Teevan, 2005).

The questionnaire is then made available for electronic completion by consumers who are members of mobile payments groups on LinkedIn but also any consumers who use Facebook with two additional questions. The 1st additional question asks if the respondents are in the UK as only UK consumer data is collected whilst the 2nd question asks the respondent to identify the source of the questionnaire i.e. Facebook or LinkedIn. The electronic version of the questionnaire is completed with no interviewer present, and as a result, any interviewer effects on the participant response data are eliminated which increases the validity of the results (Bryman & Teevan, 2005). 61 electronic questionnaire responses are received over a 4 week period following the initial electronic request. A subsequent follow-up request for questionnaire completion results in a further 11 responses being received over the next two weeks giving a total of 72 electronic response questionnaires received. The electronic questionnaire is then closed so that no further responses can be submitted.

A Microsoft Excel spreadsheet is used to capture the paper based questionnaire data and is then supplemented with the electronic data which circumvents the daunting task of coding and data capture (Bryman & Teevan, 2005). The questionnaire data is then analysed prior to any interviews being conducted so that any key research findings that are identified from the questionnaire administration can be included in the interview guide and in the subsequent interviews (Kvale & Brinkmann, 2009; Lofland & Lofland, 1984).

When considering the interview administration, the questionnaire findings are used to assist in the preparation of the interview guide which explores UK consumer perceptions of the mobile payments phenomenon (Gall et al., 2006; Kvale & Brinkmann, 2009). The use of the semi-structured interview guide ensures good use of limited interview time and assists in multiple interviews being completed

systematically and comprehensively by keeping interactions focused on the research topic (Gall, Gall & Borg, 2006). The interview guide is updated following each interview to exclude questions or aspects that are unproductive whilst focussing on areas of particular importance that are identified (Lofland & Lofland, 1984). Each interview is undertaken solely by the researcher as this ensures a similar approach is followed with each interviewee which increases results validity (Dijkstra, van der Veen & van der Zouwen, 1995). All interview data is electronically recorded with the prior agreement of the participant, so that interview focus is maintained with no distractions (Patton, 1990) whilst non-verbal points are identified (Knapp, Hall & Horgan, 2012; Power, 1998). Each interview lasts about 45 minutes and the interview data is transcribed shortly after each interview into Microsoft's Word system (King & Horrocks, 2010; Poland, 2002). An initial interview reflection is then undertaken by the interviewer followed by a preliminary content analysis to identify any characteristics or patterns in the conversation text (Berg, 2004). Any learning points that arise from the reflection and preliminary content analysis are then used in subsequent interviews through adjustments to the interview guide (Gerson & Horowitz, 2002) in order to produce focussed interview data from which key research findings are identified (Rubin & Rubin, 2012).

A pragmatic purposeful interview sampling approach is used for practical necessity (Schatzman & Strauss, 1973) as this balances the additional time and cost against the level of accuracy required (Denscombe, 2010). Interviewee participants are selected with different characteristics to create rich in-depth information (Liamputtong, 2009) although this does not produce a representative sample (Ritchie et al., 2003). In addition, interview participants are selected based upon a number of other criteria including close at hand, easy to access and available at the right time (Gerson & Horowitz, 2002). A semi-structured interview approach is used as this allows the research instrument to be adapted to the individuality of the interviewee but also ensures that in-depth data is obtained whilst superficial or exaggerated experiences are avoided (Miller & Brewer, 2003). Furthermore, the use of semi-structured interviews allow interviewees to respond in their own terms whilst providing an improved

structure for comparability (May, 2001) as any bias effects are minimised (Miller & Brewer, 2003).

Ten purposeful interviews are undertaken face to face in a convenient location and quiet environment so that each interviewee feels safe and secure (Bryman, 2012; Quinlan, 2011). This design administration allows each interviewee to express thoughts in their own words whilst following rules and procedures including relevance to the research focus (Miller & Brewer, 2003). Trust, rapport and mutual commitment are initially developed at the start of each interview (Gerson & Horowitz, 2002) whilst probing questions are used throughout. The probing questions elicit in depth responses that Hoinville, Jowell and Associates (1987, p. 101) define as “encouraging the respondent to give an answer, or to clarify or amplify and answer” although variations in probing used in different interviews reduces comparability (May, 2001).

The interviewee is allowed to ramble within the constraints of the research focus as this provides an opportunity to reveal a matter of concern that is relevant (Bryman, 1992). Each interviewee is listened to carefully as this is a key part of successful interviewing (Hammersley & Atkinson, 2007) whilst each interviewee explains their interpretation and understanding of the social world and the mobile payments phenomenon (Mason, 2002b). Empathy is also shown with each interviewee regardless of the views expressed as this increases the research integrity (Hackley, 2003). In addition, interviewer neutrality is maintained throughout the interview to avoid being regarded as an expert on the phenomenon as this helps to provide an untainted perspective (Robson & Foster, 1989). As a result, each interview produces a reflection of the interviewee’s opinions and feelings that relate directly to the mobile payments phenomenon and the research focus (Robson & Foster, 1989).

The interview data collected is the interviewee’s account and is not a reflection of any pre-conceptions (Payne & Payne, 2004) whilst the meaning of the data is then constructed through an evaluation of both what the interviewee said but also how they said it (Bailey 2008). However, transforming the oral recording into the written transcript of the voice means that body language is lost (Kvale, 2007) which none of the participants validate. As a result, it is the interpretation of the interview words that

creates the research findings albeit with the potential for multiple versions of reality (Arksey & Knight, 1999; Rubin & Rubin, 2012).

Each of the 10 interviewees is allocated a pseudonym name to protect the identity of the actual participant (British Educational Research Association, 2004; Walford, 2005). The 1st interviewee has a randomly chosen name starting with the letter A and the last one finishes with a name starting with the letter J, although each random name chosen retains the gender of the original interviewee.

5.6 Ethical Considerations

Ethics are the behavioural standards applied by the researcher (Cooper & Schindler, 2008; Edwards & Mauthner, 2002) although there are no detailed ethical rules or procedures. Diener and Crandall (1978, p. 14) define ethics as “expressions of our values and a guide for achieving them” although any ethical course of action is dependent upon the contradictory criteria that is applied (Israel & Hay, 2006). UK consumers are an integral part of this empirical research and as a result a deontological view is taken (Cozby, 2009) with each participant advised that participation is voluntary and that withdrawal from the research is possible at any time with no consequences (Gregory, 2003).

Furthermore, subjective ethical decisions are used in this mobile payments research and consistently applied across all stages of the ethics continuum as identified by Saunders et al. (2012) and shown in the Figure 15 - Application of Ethics and Ethical Practice below:

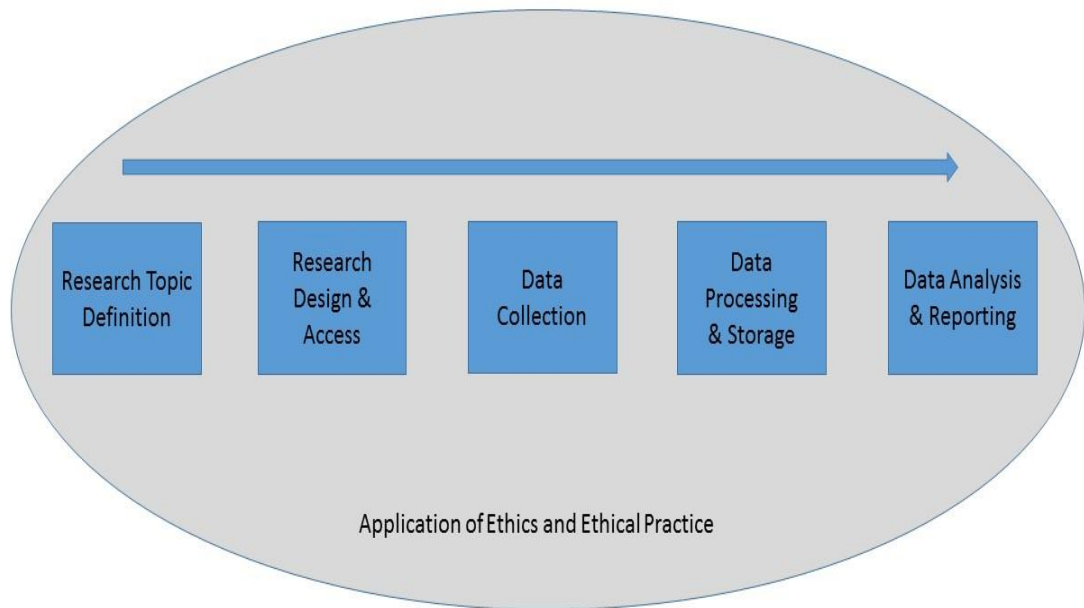


Figure 15 - Application of Ethics and Ethical Practice

Developed by C C Hampshire (2015) from Saunders, Lewis and Thornhill (2012)

The ethical responsibilities for this research are taken very seriously and are consistently applied to each of the four obligations which overlap and inter-connect (Cameron & Price, 2009) as shown in Figure 16 - Inter-relationship of Ethical Obligations below:

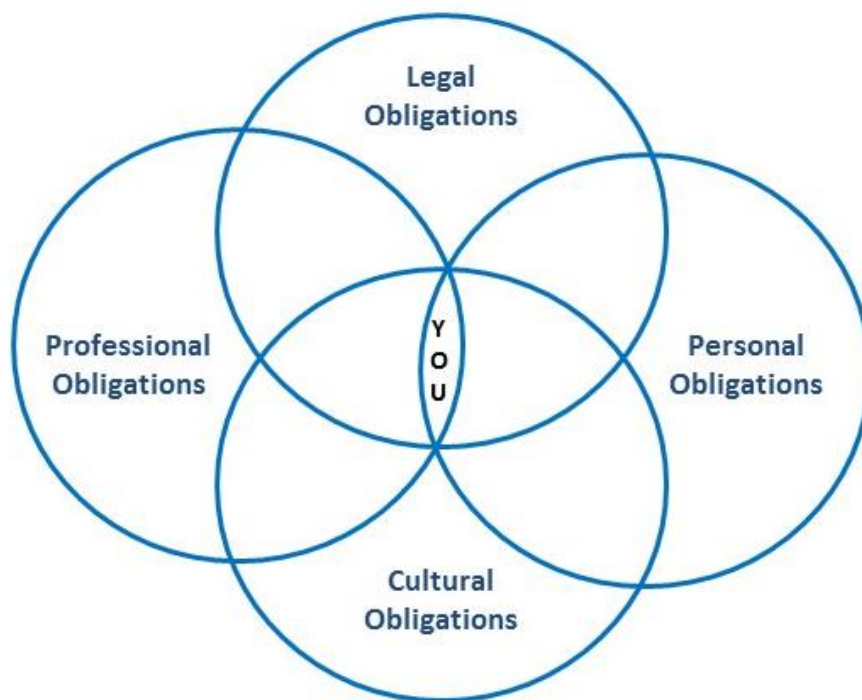


Figure 16 - Inter-relationship of Ethical Obligations (Cameron & Price, 2009)

When considering ethics in research instrument design and access, the ethics and ethical issues that apply to the use of consumer survey as a research instrument are those associated with more general ethical issues of confidentiality, privacy, deception and objectivity (Zikmund, Babin, Carr & Griffin, 2013). The ethical issues are evaluated and addressed effectively as part of the research design phase (Creswell, 2013) although ethical issues may arise spontaneously throughout the research or thereafter (Oliver, 2010). The research design fully addresses the two key ethical aspects of social research which are providing participant anonymity and participants suffer no harm (Bryman & Bell, 2011; O’Leary, 2004).

The use of a questionnaire as a research instrument minimises ethical problems compared to other research instruments (Dale, Arber & Proctor, 1988) and is designed to ensure anonymity of the participants as far as is practical and reasonable (Quinlan, 2011). The questionnaire administration ensures that participants are aware that participation is voluntary, provides participant anonymity and that only summary data is published as shown in the research purpose section of the questionnaire which is provided as Appendix A. Furthermore, the questionnaire introduction establishes a balance between the amount of time that is taken explaining the research against the willingness of participants to provide their time to complete the questionnaire (Bordens & Abbott, 2010) which demonstrates the subjective ethical process and how compromise occurs between ethical ideals and real-world problems (Homan, 1991).

Purposeful sampling is used with each interviewee selected from existing contacts as improved access is achieved when the researcher is known to the individual (Easterby-Smith et al., 2012) which establishes an existing level of credibility and provides a much stronger foundation in the belief of anonymity and confidentiality (Bryman, 1988). In addition, assurances of anonymity and confidentiality are also provided to each interviewee as part of negotiating access as this further assists in securing consent (Gregory, 2003).

When considering ethics in research instrument administration and data collection the use of LinkedIn and Facebook as methods of data collection raises specific ethical technology usage issues (Bryman & Bell, 2011) including an over-researched

participant population suffering from weariness (King & Wincup, 2007). In addition, the authenticity of any participant response is a specific ethical concern as the internet makes it easier for false consumer survey responses to be submitted (DeLorme, Zinkham & French, 2001).

Each participant is provided with a clear definition of participation in plain English using terms that are easily understood as informed consent is a key ethical issue (Fisher, 2010). This ensures that each participant is aware of what is required of them before they make a decision on participation (Robson, 2011). The level of information that is provided is a subjective assessment and is both sufficient and satisfactory for the purpose (Allmark, 2002). The information provided is what a participant would want to know (Israel & Hay, 2006) without providing too much information that may result in boredom or information overload (Bordens & Abbott, 2010; Miller & Brewer, 2003). The questionnaire and interviews are designed and administered to ensure that they are not regarded as intrusive and do not invade the privacy of any participant (Bulmer, 1979) although the definitions of intrusive and privacy are subjective terms. Furthermore, over-zealous questioning in each interview is avoided, as each participant is not pressed for a response at any time and no demeaning questions are asked in order to avoid interviewee stress (Sekaran & Bougie, 2013).

When considering the ethics in data analysis and reporting, all the research data is kept in a secure environment in the office of the researcher and on a PC that is password protected so that it is only available to those who are meant to have access to it (Luders, 2004). The data that is obtained is judgemental and value-laden (Jankowicz, 2005) although rational interpretation is used within the data analysis to produce the findings that minimises any bias (Huberman & Miles, 2002). All the key mobile payments data is reported accurately with no misrepresentation or selectivity of the data presented (Zikmund et al., 2013) although it is acknowledged that a subjective assessment is used to determine what denotes key mobile payments data. In addition, there is no fabrication of any research data, falsification of the research results or misrepresentation of the research findings (Israel & Hay, 2006).

5.7 Summary

This chapter established and justified a post-positivist philosophy with a social constructionist ontology as this research explores the ways in which UK consumers make sense of the mobile payments phenomenon within their own socially constructed world (Ritchie & Lewis, 2003). Furthermore, reality is constructed by individual UK consumers based upon existing knowledge and understanding that is interpreted through separate context dependent experiences (Easterby-Smith et al., 2012) whilst cause and effect can only be theoretical the research findings are subjective (Bryman, 2012; Huberman & Miles, 2002). The chapter went on to identify other philosophical positions and provided a rationale for why these are inappropriate for exploring UK consumer interest in the mobile payments phenomenon.

The rationale for the use of sequential mixed methods research was then provided and justified as this research explores and interprets UK consumer behaviour perspectives using empirical UK consumer data (Hussey & Hussey, 1997; Saunders et al., 2012). Other research strategy options were then identified along with rationale for why these are unsuitable for this research and the chapter concluded with the identification of a number of methodology limitations. A full description of the administration of the research instruments was then provided as this increases the validity and reliability of the research findings (Flick, 2011) before the data collection processes were explained and justified. The chapter concluded by exploring the research ethics that apply to the various disparate aspects of this research.

The next chapter describes clearly the numerical data analysis that is undertaken on the quantitative questionnaire data and the narrative analysis that is undertaken on the qualitative interview data. The chapter goes on to identify the data validity and data reliability that applies to the analysis that is undertaken on empirical data obtained.

6 Data Analysis, Validity and Reliability

6.1 Introduction

In the previous chapter the post-positivist philosophical position with a social constructionist ontological perspective were reviewed and justified before the research strategy was explained which involves sequential mixed methods and acknowledging that multiple versions of reality can be constructed (Rubin & Rubin, 2012) as UK consumers make sense of the mobile payments phenomenon within their own socially constructed world (Ritchie & Lewis, 2003). The chapter went on to describe and justify the research design whilst providing a detailed description of the research instrument administration as this increases validity and reliability of the research findings (Flick, 2011).

This chapter reviews the numerical data analysis undertaken on the questionnaire data and the narrative analysis that is undertaken on the interview data and applied constructively to the research aims, objectives, questions and research propositions explored. The chapter goes on to review the data validity and reliability that includes the data analysis that is undertaken as this establishes the basis for the subsequent validity and reliability of the research findings (Hammersley & Atkinson, 2007). The chapter also covers data validity that arises from the provision of a comprehensive account of the processes used (Hammersley & Atkinson, 2007) and the use of low inference descriptors (Seale, 1999).

Data analysis of both the questionnaire data and the interview data is used to identify meaning from the empirical data collected from UK participants (Bogdan & Biklen, 1982; Ghauri & Gronhaug, 2010). This meaning identified from the data analysis is presented as research findings and contextualised within the existing body of literature on the phenomenon.

The key theoretical positions that this research takes is shown in Figure 17 - Data Analysis Chapter Structure below:

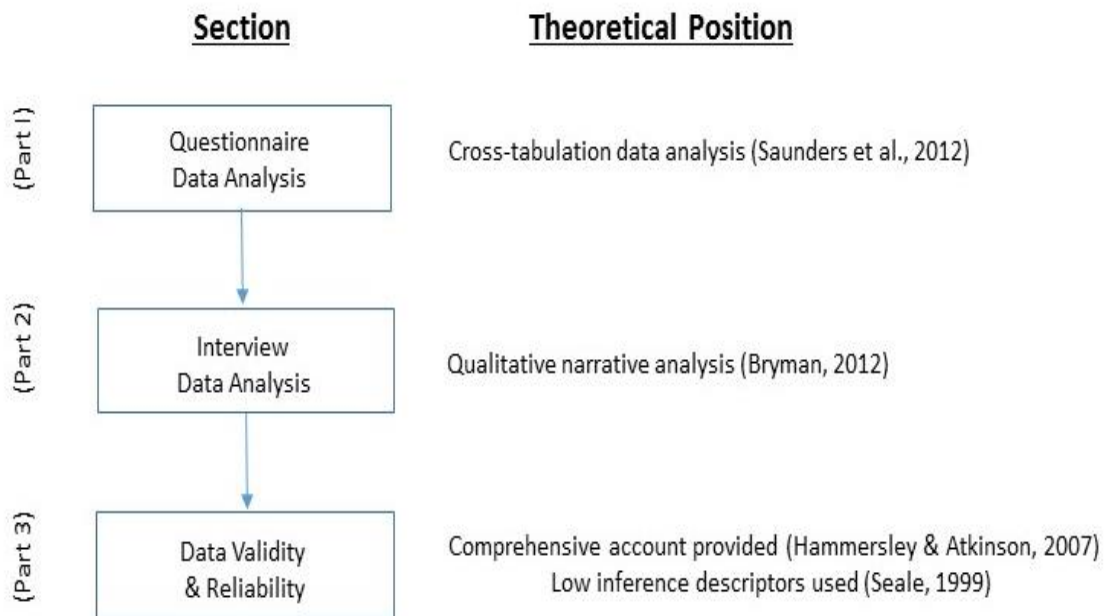


Figure 17 - Data Analysis Chapter Structure

6.2 Questionnaire Data Analysis

6.2.1 Overview

The use of an electronic questionnaire as a research method aims to produce a large a sample of respondents as was possible in the time period (Robson, 2011). However, despite additional requests for further completed surveys to the members of these two electronic groups on Facebook and LinkedIn 57 electronic respondents actually complete the questionnaire. The electronic questionnaires are supported with data collected from face to face questionnaires that produces an additional 63 responses with an overall sample of 120 being received. However, 15 of the electronic responses are from outside the UK so are not used. The overall response rate is consistent with Bryman (2012, p.199) who states that “most... surveys attract a certain amount of non-response... it is likely that only some members will agree to participate”. As a result, a much smaller number of questionnaires are received than expected whilst a number of responses may not have been obtained that may have been significant and influenced the findings that were identified from the questionnaire data (Saunders et al., 2012).

The data analysis undertaken on the questionnaire data is clearly explained as this establishes the basis for the validity and reliability of the research findings (Flick, 2011; Hammersley & Atkinson, 2007). Coding of the questionnaire responses is undertaken through allocation of numbers as codes (Bryman, 2012) and the coded data is transferred into Microsoft's Excel spreadsheet application which provides the basis for the identification of linkages as well as supporting the production of the results in graphs or tables (Bazeley & Jackson, 2013; Quinlan, 2011). However, coding is largely an arbitrary process (Bryman & Teevan, 2005) as the codes are solely tags that allow data to be analysed which Strauss (1987, p. 20) defines as "conceptualizing the data" although consistent data coding principles are followed in order to ensure that the coding is accurately and fully undertaken (Bryman & Cramer, 2011). The coded data is sorted and organised from which various concepts evolve as this leads to the identification of new mobile payments knowledge (Pole & Lampard, 2002).

A limited amount of nominal questionnaire data is obtained that includes age, gender and educational qualifications along with the data source (electronic or paper) whilst ordinal data is obtained through use of the Likert scale questions which reflects the respondent's subjective criteria (Bryman, 2012). The analysis of the questionnaire data that is undertaken includes the data obtained from each question but also includes multiple cross-question analysis where the ordinal data elements are assessed together with the nominal data in order to identify trends that Saunders et al. (2012, p. 473) describe as "establishing statistical relationships between variables". The data element within each likert scale answer is allocated a numerical code that ranges from 1 for strongly disagree through to to 6 for strongly agree dependent upon each respondent's answer to that particular question as this supports the mathematical mean calculations that are undertaken on each ordinal data element as an independent variable using Excel's formula functions with a mathematical mean mid point of 3.5. In addition, further mathematical mean calculations are undertaken using cross tabulation where the likert scale ordinal data is compared against the nominal data of age and educational qualifications using Excel's formula functions (Bazeley & Jackson, 2013). However, comparison of the ordinal data to the nominal data for educational

qualifications is not included as any mathematical mean answers would be unreliable due to the limited number of responses some of the educational qualification categories.

6.2.2 Questionnaire Statistical Analysis

6.2.2.1 Personal Characteristics effect on Perceived Ease of Use

Four questions are used to assess whether personal characteristics have an effect on perceived ease of use and two of these questions are 'I find my Personal Computer, Laptop computer or Tablet computer technology easy to use' and 'I find my mobile phone technology easy to use' with answers using a 6 point Likert scale. The mathematical mean to the 1st question is 5.29 with a very small mean variance based upon gender whilst the mean based upon educational qualifications is 5.07 for respondents with GCSE and 5.08, 5.36 and 5.38 for respondents with A levels, a degree and post-graduate qualifications respectively although this is less than a 6% overall variance.

The mathematical mean to the 2nd question is 4.97 with a very small mean variance based upon gender whilst the mean based upon educational qualifications is 4.64 for respondents with GCSE qualifications and 5.38, 4.88 and 5.02 for respondents with A levels, a degree and post-graduate qualifications respectively with an overall variance of 13.8%.

The other 2 questions are 'I find a smart phone easy to use' and 'I find Internet Banking easy to use' with answers of yes; no or unsure. 9.9% of respondents indicate that a smart phone is not easy to use whilst 14.9% are unsure. In addition, 6.9% of respondents indicate that internet banking is not easy to use whilst 13.9% are unsure although both questions have a slightly higher portion of males who indicate a not easy to use response albeit on very small volumes.

6.2.2.2 Personal Characteristics effect on Perceived Usefulness

Three questions are used to assess whether personal characteristics have an effect on perceived usefulness which are 'I have heard of mobile wallets; 'I have heard of contactless payment cards' and 'I have seen the contactless payment symbol in a retail

store in the UK' with answers of yes or no. 58% of respondents indicate that they have not heard of mobile payments whilst 21% of respondents indicate they have not heard of contactless payment cards and 14% of respondents indicate they have not seen the contactless payment symbol.

6.2.2.3 Perceived Ease of Use effect on Perceived Usefulness

Two questions are used to assess whether perceived ease of use has an effect on perceived usefulness with answers using a 6 point Likert scale. The two questions are 'I believe that learning how to make a mobile payment will be easy for me' and 'I anticipate making a mobile payment will be easy'. The mathematical mean for the 1st question is 5.05 with a very small mean variance based upon gender whilst the mean based upon educational qualifications is 4.50 for respondents with GCSE qualifications and 5.08, 5.00 and 5.22 for respondents with A levels, a degree or post-graduate qualifications respectively with an overall variance of 13.8%.

The mathematical mean for the 2nd question is 4.85 with a very small mean variance based upon gender whilst the mean based upon educational qualifications is 4.50 for respondents with GCSE qualifications and 4.85, 4.88 and 4.91 for respondents with A levels, a degree or post-graduate qualifications respectively with an overall variance of 8.4%.

6.2.2.4 Perceived Trust effect on Perceived Usefulness

Two questions are used to assess whether perceived trust has an effect on perceived usefulness with answers using a 6 point Likert scale. The two questions are 'I would trust that my personal information is safe (meaning secure and confidential) when making a mobile payment' and 'I would trust mobile payments if a guarantee was provided that only payments made by me result in monies being taken from my account'. The mathematical mean for the 1st question is 4.13 with a very small mean variance based upon gender whilst the mean based upon educational qualifications is 3.64 for respondents with GCSE qualifications and 4.62, 4.48 and 3.91 for respondents with A levels, a degree or post-graduate qualification respectively with an overall variance of 21.2%.

The mathematical mean for the 2nd question is 5.07 with a very small mean variance based upon gender whilst the mean based upon educational qualifications is 4.71 for respondents with GCSE qualifications and 5.31, 5.36 and 5.0 for respondents with A levels, a degree or post-graduate qualifications respectively with an overall variance of 12.1%.

6.2.2.5 Perceived Trust effect on Perceived Risk

Three questions are used to assess whether perceived trust has an effect on perceived risk with answers using a 6 point Likert scale. The three questions are 'I would trust a mobile payment service provided by a UK Bank'; 'I would trust a mobile payment service provided by my mobile network operator' and 'I would trust a mobile payment service provided companies other than a bank or mobile network operator'. The mathematical mean for the 1st question is 4.68 with a very small variance based upon gender whilst the mean based upon educational qualifications is 4.43 for respondents with GCSE qualifications and 5.15, 4.92 and 4.51 for respondents with A levels, a degree or post-graduate qualifications respectively with an overall variance of 14.0%.

The mathematical mean for the 2nd question is 3.90 with a very small variance based upon gender whilst the mean based upon educational qualifications is 3.79 for respondents with GCSE qualifications and 4.38, 3.92 and 3.80 for respondents with A levels, a degree or post-graduate qualifications respectively with an overall variance of 13.5%.

The mathematical mean for the 3rd question is 4.19 with a very small variance based upon gender whilst the mean based upon educational qualifications is 3.64 for respondents with GCSE qualifications and 4.69, 4.36 and 4.11 for respondents with A levels, a degree or post-graduate qualifications respectively with an overall variance of 22.4%.

6.2.2.6 Perceived Risk effect on Perceived Usefulness

Two questions are used to assess whether perceived risk has an effect on perceived usefulness with answers using a 6 point Likert scale. The two questions are 'I believe that using a contactless card to make a payment has risks' and 'I believe that using a

mobile phone to make a payment has risks". The mathematical mean to the 1st question is 4.43 with a very small variance based upon gender whilst the mean based upon educational qualifications is 4.43 for respondents with GCSE qualifications and 4.00, 4.40 and 4.51 for respondents with A levels, a degree or post-graduate qualifications respectively with an overall variance of 11.3%.

The mathematical mean to the 2nd question is 4.47 with a very small variance based upon to gender whilst the mean based upon educational qualifications is 4.64 for respondents with GCSE qualifications and 3.92, 4.40 and 4.60 for respondents with A levels, a degree or post-graduate qualifications respectively with an overall variance of 15.5%.

6.2.2.7 Perceived Ease of Use effect on Attitude

Two questions are used to assess whether perceived risk has an effect on perceived usefulness and these are 'If I have to register for a mobile payment service this would reduce my interest in mobile payments' and 'I find the following facilities easy to use on my mobile phone' 'I have heard of contactless payment cards'. The 1st question provides answer options of yes; no or unsure and 42% of respondents indicate that registration would have a negative impact whilst a further 21% of respondents are unsure.

The answer option to the 2nd question provides a choice of Apps in a list along with an option to add any App not included in the list. The average number of Apps used by all questionnaire respondents is 9.75 although respondents aged 55 to 64 years old use an average of 7.62 Apps whilst those aged 65 years and older use an average of 3.93 Apps. Furthermore, there is also an App usage bias by gender for those 20 respondents aged 55 to 64 years old as the 11 male respondents use an average of 9.18 Apps whilst the 9 females use an average of 5.6 Apps.

6.2.2.8 Perceived Usefulness effect on Attitude

Three questions are used to assess whether perceived usefulness has an effect on attitude with 2 of the 3 questions with answers using a 6 point Likert scale. The three questions are 'A mobile payment will be of interest to me if it is faster than other types

of payment'; 'I would find a mobile payment useful if it means avoiding queues to pay' and 'I would make a mobile payment up to a maximum of'. The mathematical mean to the 1st question is 4.63 with a very small variance based upon gender whilst the mean based upon educational qualifications is 3.93 for respondents with GCSE qualifications and 5.08, 4.80 and 4.58 for respondents with A levels, a degree or post-graduate qualifications respectively with an overall variance of 22.6%.

The mathematical mean to the 2nd question is 5.26 with a mean variance based upon gender of 5.47 for males and 5.04 for females whilst the mean based upon educational qualifications is 4.64 for respondents with GCSE qualifications and 5.54, 5.32 and 5.31 for respondents with A levels, a degree or post-graduate qualifications respectively with an overall variance of 16.2%.

The answers provided to the 3rd question identify a wide range of mobile payment upper limit values with 22 respondents indicating an upper limit of £100; 20 respondents indicating an upper limit of £50; whilst 12 respondents indicate an upper limit of £999 or £1,000 although an upper limit of £12 or less is indicated by 9 respondents as shown Chart 1 - Upper mobile payment limit below:

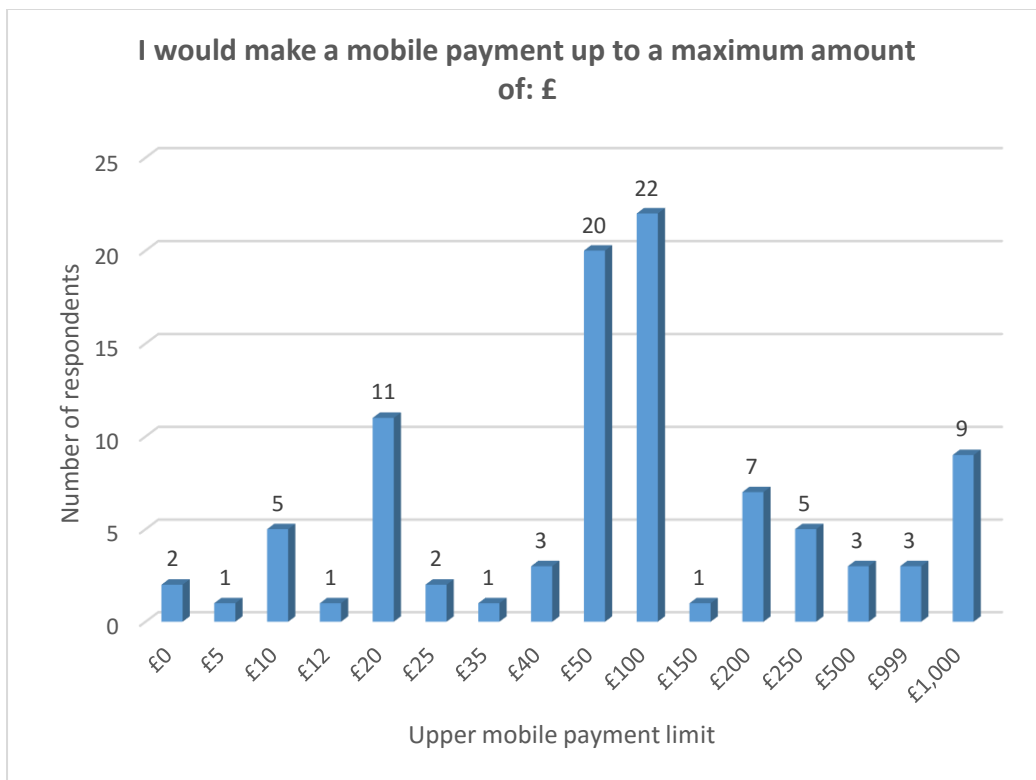


Chart 1 - Upper mobile payment limit

The mean average upper limit value for all questionnaire respondents is £208.22 although this reduces to £92.86 when the 3 respondents who indicate a transaction value of £0 and £5 and excluded along with the 12 respondents who indicate an upper transaction value of £999 and £1,000. 8 of the 12 respondents who indicate an upper limit of £999 or £1,000 are male whilst 7 out of these 12 respondents hold a post-graduate degree and the remaining 5 respondents hold a Bachelor degree.

6.3 Interview Data Analysis

6.3.1 Overview

A pragmatic approach is taken with the interview data analysis although it is recognised that a number of consumer perceptions may not have been identified due to the small scale nature of this research enquiry (Miles & Huberman, 2014). Ten semi-structured purposeful interviews are undertaken face to face in a convenient location and quiet environment (Quinlan, 2011) whilst undertaking further interviews was constrained by consumer and researcher availability (Robson, 2011). The ten interviews produce a limited amount of empirical data and as a result, the research findings may not reflect the views of the wider UK adult population (Ritchie et al., 2003) although this was never the intention. Content analysis is used is shown below as steps in a sequence:

- Familiarisation with the interview data by reading each transcript carefully.
- Apply codes to the transcribed data within each interview.
- Identify similar phrases, patterns and themes within each interview that are relevant to the research propositions explored.
- Isolate patterns and processes, commonalities and differences .
- Compare the key interview findings to the questionnaire findings to identify words or phrases that are used that are relevant to the research propositions explored.

The data familiarisation is achieved by reading each transcript on a case by case basis, several times until initial categories and specific observations start to be identified which is consistent with Ritchie and Lewis (2003). Codes are then allocated to the data through the process of open coding, creating categories and abstraction (Silverman,

2011). The next stage of the content analysis process is to make sense and understand what has been said from the data (Morse et al., 2001) through the identification of themes that are connected to the different items within the semi-structured interview guide that relate to the research propositions explored.

All the qualitative data obtained from each interview is manually coded based upon the actual words used by each interviewee in order to understand and identify the meaning that is relevant to each research proposition. Manual coding ensures that data patterns are not missed which can occur with automated data coding systems (Strauss & Corbin, 1990). The relationships and connections of the themes are identified following the code allocation which leads to categories being identified that are meaningful in describing the consumer perceptions of each of the research propositions (Strauss & Corbin, 1990). As a result, the themes identified in the interview data describe the perceptions of the mobile payments phenomenon within the social world of each interviewee (Gill & Johnson, 2010). These categories are then finally interpreted, compared and contrasted with themes identified within existing knowledge of the phenomenon but also interpreted in relation to the individual research propositions explored.

In order to methodically identify explanatory themes (Dunworth, 2008), all stages involved in the analytical hierarchy are systematically undertaken (Ritchie, Spencer & O'Connor, 2003) as shown in Figure 18 - Interview Data Analytics Hierarchy below:

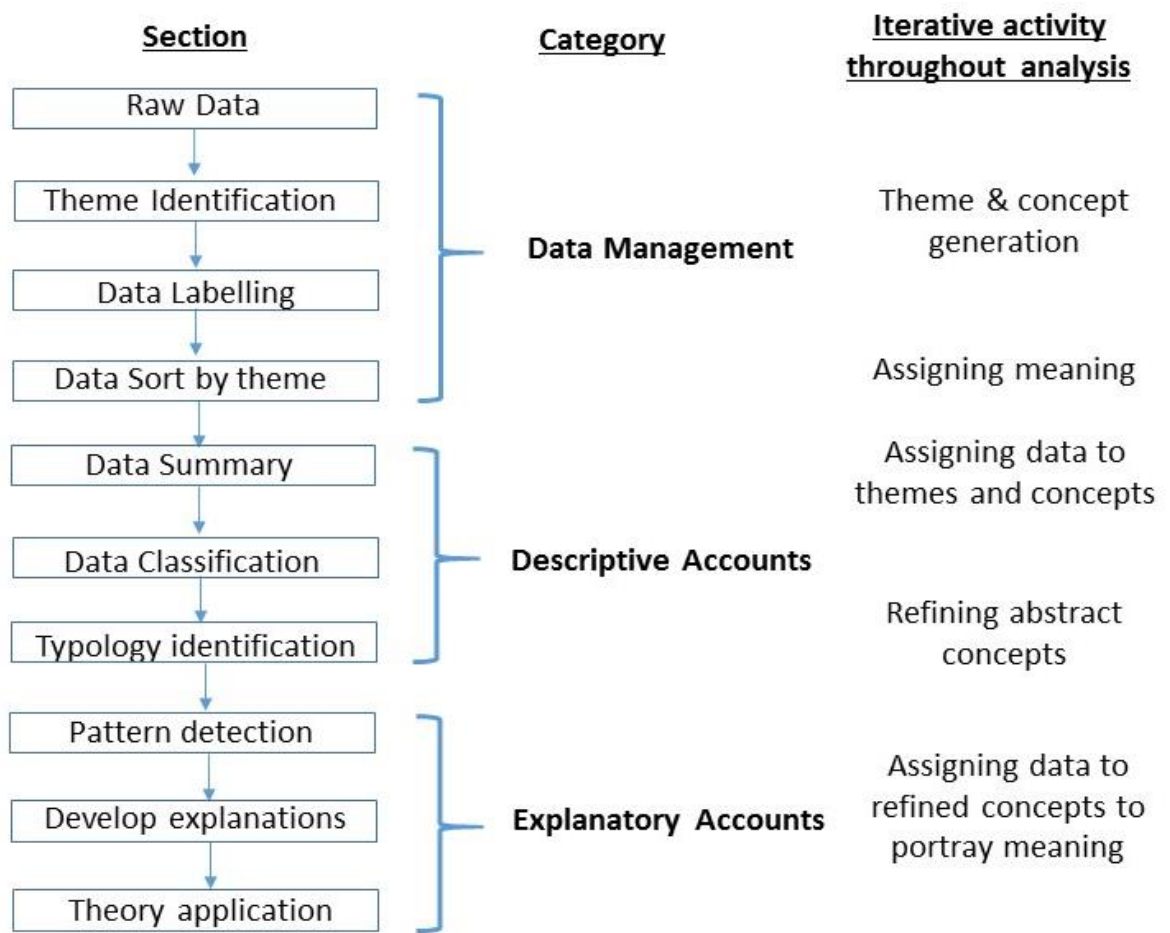


Figure 18 - Interview Data Analytics Hierarchy (Ritchie et al., 2003)

Actual text content extracts of interviewee data are used to aid understanding of the meanings and the new knowledge that is identified from the interviewees' perceptions of the phenomenon with interview quotations used to justify the qualitative findings together with the relevant quantitative findings (Schilling, 2006). This use of each interviewee's precise words acknowledges but also limits how research accounts are "always constructed by the researcher on the basis of the participants' accounts" (Maxwell, 2012, p.49) whilst supporting the individual research findings through the provision of a voice to each interviewee's perspectives.

The interviewees have a broad range of ages from 18 years old to 76 years old, albeit with a predominance of interviewees aged 45 and over and the interviewees comprise 4 males and 6 females. In addition, the interviewees have a broad range of educational backgrounds that include 2 interviewees with GCSE/O levels through to 6 interviewees who hold a post graduate degree qualification.

6.3.2 Interview Content Analysis

6.3.2.1 Personal Characteristics effect on Perceived Ease of Use

All interviewees use internet banking as they state that 'internet banking is easy to use' or 'very easy to use'. All interviewees also indicate that they use technology including PCs, laptops, tablet computers and smart phones and that they are comfortable with technology ease of use, albeit explaining this in different ways.

Freddie (male aged 18 and O level educated) says 'various technologies don't faze me'; whilst Charlie (male aged 45 to 55 years old with a post-graduate degree) says 'I use technology all the time and am very comfortable with it'. Alison (female aged 65+ years old and O level educated) says 'I am not frightened of technology but it takes me longer to get there than it probably would if I was 20' whilst Edward (male aged 45 to 55 years old with a post-graduate degree) and Graham (male aged 60 with a bachelor degree) both say 'I set up the phone myself' and Julia (female aged 45 to 55 years old with a post-graduate degree) says 'I do everything on the computer using Microsoft Office applications'.

Furthermore, all interviewees indicate that their mobile phone or smart phone is easy to use in various forms including Beccie (female aged 45 to 55 years old with a post-graduate degree) who says 'I now find my (*Apple*) iPhone 5 very easy to use but the transition from my Blackberry was quite a change... it took me about 3 weeks to get used to new smart phone navigation and to get it to do what I want in day to day use'. Diana (female aged 56 with a post-graduate degree) says 'I don't have a smart phone but I only do text and calls on my phone' whilst Hope (female aged 45 to 55 years old and A level educated) says 'my Samsung S4 (*smart phone*) is fabulous and quite simple to use'. In addition, Isla (female aged 40 with a post-graduate degree) says 'I am pretty good with my iPad and mobile phone... it is just the touch being the main difference for me from the phone I'd had before but once you get the hang of it it's fine'.

6.3.2.2 Personal Characteristics effect on Perceived Usefulness

All interviewees indicate that they use technology for the usefulness that each of the consumer orientated technology devices provide, albeit the interviewees explain this in different ways.

Charlie identifies that various technology devices have different usefulness features when he says 'I prefer my laptop for heavy duty keyboard work as it is more precise and accurate. However, I watch TV and YouTube on my Apple iPad... I do use different devices for different things and different functions whilst my primary use of the Blackberry phone is for email... and virtually every day I am online to my bank account'. This is consistent with Edward who says 'I use enough to get through what I need... but I only use 10% of the smart phone's capabilities for internet, email text and calls. However, I use my iPad all the time for emails, news, Facebook and LinkedIn'. This different device usefulness is also supported by Graham who says "I use different devices for different functions and compartmentalise my usage. I use a mobile phone regularly with 3G... for calls, text and internet access which is also used for social networks, browsing and placing a bet'.

In addition, Alison identifies the usefulness of her mobile phone when she says 'I can do a lot of things on my existing phone... although I use my mobile phone purely as a telephone but with the text as an extra option'. Other interviewees identify further technology usefulness functions including Freddie who says 'I use Microsoft's Excel application and another App to manage day to day expenditure and reconcile my bank account... I also use a lot of applications for own personal requirements'. The technology usefulness of consumer devices is also identified by Isla when she says 'I remember before I got the iPad seeing the adverts that showed you what you could do with an iPad... I use technology applications at work and at home'.

Furthermore, the majority of interviewees indicate awareness of contactless payments. However, Isla says 'I am not aware of contactless payments and not aware that my bank have issued contactless cards. I am also not aware that organisations accept contactless cards and I have never seen the contactless payment symbol'.

6.3.2.3 Perceived Ease of Use effect on Perceived Usefulness

A number of interviewee responses identify the influence of perceived ease of use on perceived usefulness but with a wide variation in the way that this is explained by the interviewees.

Hope says 'the ease of use of my Samsung S4 (*smart phone*) is fabulous and quite simple to use' before proceeding to identify the usefulness of the phone when she says 'I use my smart phone for phone calls but I also use my phone for a number of other things such as email, the camera for photos and video as well as calendar reminders'. This view of the smart phone is consistent with Isla who says 'I saw this update on Facebook that said "did you know the 20 things that your iPhone can do?" and I didn't know any of them including some simple things that were interesting'. Isla then goes on to identify that her new iPhone is easy to use when she says 'I don't remember it being difficult. It is just the touch screen being the main difference for me from the phone I'd had before; but once you get the hang of it it's fine and I wouldn't go back to the old style now'. Isla then proceeds to identify the usefulness of her iPhone when she says 'I use the phone for text, phone, browsing the internet, Facebook linking and photographs but these are the main things. I am a Doctor (*GP*) and I have used Apps like medical calculator where I can put data in and get a risk assessment for certain things'.

However, the above views are in contrast with Alison who says 'I am OK on my mobile phone but the iPad thing I have no idea but I haven't got one. I am average but not brilliant on my PC with a reasonable knowledge considering my age, but I am certainly not a wiz'. Alison then goes on to identify that portable consumer devices can lose their usefulness when she says 'my experience of the last 2 weeks would make me very doubtful about something small (*smart phone*) that you could lose and I would rather have my computer in my little study'. This perspective is consistent with Beccie who says 'technology is an integral part of our life now' before going on to identify a concern with the usefulness of contactless cards when she says 'ease of use will be very easy and I have a new card with the contactless payment facility but I don't need to get it

out of the bag (*to make a payment*) which may mean I am paying for people stood next to me’.

6.3.2.4 Perceived Trust effect on Perceived Usefulness

A number of interviewees indicate that trust has an influence on usefulness of mobile payments, albeit the interviewees explain this in different ways.

Charlie says ‘I am not aware of a bank guarantee on contactless payments... although the guarantee may have been hidden in the small print’ before he then goes on to add ‘I have used it (*contactless payment card*) twice so far but generally I put my card in the machine and enter my PIN although I am very security conscious’. This lack of awareness is consistent with Julia who says ‘I am not aware of a mobile payment guarantee’ but then goes on to say ‘I am aware of the Direct Debit guarantee but it wouldn’t increase my trust in the organisation if a mobile payment guarantee equivalent was provided but it would increase the trust in confidence in using it, although it makes you a bit more likely to use it’.

However, Hope identifies that trust is generated from a number of other aspects when she says ‘if the mobile payment is backed by advice and a booklet that would be positive and other regions of the world are already using it (*mobile payments*) which adds to the trust in this payment facility’ before going on to state that ‘my security concerns decrease with a payment guarantee’. In addition, Graham identifies concerns on the safety of providing his personal information to organisations when he says ‘I am OK with that (*wireless environment and security*) as long as I know who I am dealing with. As long as the organisation I am giving my details to is secure, although I am less comfortable with some situations like theatre tickets. I am not comfortable sometimes releasing my details to somebody I don’t know, but I am comfortable to the extent where I think the organisation is trustable. I am comfortable paying a bill to British Gas’.

Contactless payment trust concerns are identified by Alison who says ‘it (*payment transaction*) is a little bit more secure if you have to enter your PIN every so many

transactions which would limit the amount stolen before you put a stop on it... in 20 years' time this will be a massive risk as no PIN validation puts the individual at risk'.

6.3.2.5 Perceived Trust effect on Perceived Risk

All interviewees indicate that different aspects of trust influence risk with a focus on organisational trust and these various trust influences are explained by the interviewees in different ways.

Trust in a UK bank is identified by Alison when she says 'established banks have been going for a very long time and their morals are totally different... banks would only pay once and I do think the new players have a lot to learn yet. If a UK bank makes a mistake you will get it refunded by the bank'. This trust in UK banks is consistent with Charlie who says 'I trust Barclays (*bank*)' and with Hope who says 'I have trust in established banks for mobile payments but I have concerns with multiple companies involved in the food chain although Visa and MasterCard engenders trust'. In addition, Beccie says 'the provision of a payment guarantee would add to the security view and all are cumulative steps to trust building... well known UK brands have a significant effect on trust but there is no bench mark for technology trust' whilst Julia says 'a more traditional bank would be more supportive... a bank will sort it out if there's a problem'.

A slightly different perspective is provided by Edward who says 'my trust in established financial organisations is quite high following my previous experience and working in banks... I will get the cash back (*payment*) based upon the trust of well-established banking organisations... I would have a different attitude to a small foreign bank though... I wouldn't choose to use new (*mobile payment*) entrants'. However Diana suggests that trust is independent of the organisation when she says 'I would put the risk of Google and PayPal on a level with banks. It is all computerised; it's all out of your hands... I would trust Google with internet security as I would trust Lloyds bank. It is all technology and you are putting your trust in the whole thing and you can't really judge which is safer. You can't compare as you have no knowledge as a consumer to compare security of Lloyds bank or that of Google or a company that has just started'.

Trust in all organisations is in contrast to Edward who says 'underlying perceptions of trust in large established organisations with global brands can be vapourware through the inaccurate consumer perception of indemnities. PayPal get the benefit of indemnities through the existing banking infra-structure but that doesn't actually exist with these payments. The level of trust in a global brand is higher whilst the substance behind it might not be what we perceive it to be. I am more cautious on the use of PayPal given the lack of chargeback rights as it isn't covered by Section 75 of the Consumer Credit Act'. This trust concern with PayPal is also identified by Alison who says 'PayPal have not got strict controls and it is proven to be open to abuse'.

A couple of interviewees indicate that their organisational trust is based upon perceptions of controls as shown by Isla when she says 'I don't think I'd have any concerns over the payment provider as I'd imagine that in order for them to provide the (*mobile payment*) facility they'd have to be checked and told they're secure so that side of it wouldn't worry me'. This control perspective is consistent with Freddie who says 'I just assume that the (*mobile payment*) organisation has to be legitimate to be in the field'.

However, Julia identifies a lack of trust in MNOs when she says 'the least trust would be the T-Mobile type (*MNO*) but I wouldn't be too worried. I trust big organisations as it is in their own interest not to mess it all up'.

6.3.2.6 Perceived Risk effect on Perceived Usefulness

All interviewees indicate that different aspects of perceived risk influence perceived usefulness with a focus on device loss and these risks are explained by interviewees in different ways.

Hope indicates her concern with the use of a portable consumer device when she says 'I have concerns with the smart phone on view for mobile payments as this may lead to the phone being targeted and stolen... and the fraud concerns that result from device loss'. This idea of the smart phone being stolen is consistent with Freddie who says 'it is easier to steal a phone that is more valuable compared to other mobile payment device types' but then goes on to say 'if you get mugged your wallet would

get stolen along with mobile phone and watch if valuable, so the risk by device type is irrelevant and the fraudster can just “wave and go” without any other control even with multiple transactions with small transaction values’. This device loss risk is consistent with Beccie who says ‘the more complex the device the more personal data is held and the higher risk associated with it. I’d need to be absolutely certain that the security is protected’. This data risk is also identified by Julia who says ‘I’d guess that security of all your information in one place and the concerns if you lost it with information about yourself. You’d be setting yourself up for a security issue with it all in one place; but having said that it is all in my handbag. These portable consumer devices could become very attractive to thieves regardless of device type and being out and about increases the risk slightly’.

In addition, Isla identifies a further risk when she says ‘I have concerns in a mobile environment about my data and security’. This is consistent with Graham who says ‘I would feel uncomfortable wirelessly waving my card around – where else may this message be being seen? I don’t know; and there may be 14 people sitting outside with laptops capturing my personal information’ whilst Charlie says ‘I have some concerns about the security of mobile phones’.

Furthermore, Alison identifies a contactless payment risk when she says ‘there’s a massive risk as you don’t have to enter your PIN or sign anything. If you drop your card on the pavement anyone can pick the card up and go and use it. So without a PIN there has to be a risk’. Alison then goes on to identify an electronic payment risk when she says ‘there isn’t the same level of control with moving money around in an electronic environment’.

6.3.2.7 Perceived Ease of Use effect on Attitude

A number of interviewees indicate that perceived ease of use has an influence on attitude towards mobile payments, albeit the interviewees explain this in different ways.

A number of interviewees indicate that a mobile payment registration process would have an influence on attitude including Alison who says ‘I don’t think I’d be terribly

happy to complete a registration process' which is consistent with Charlie who says 'I wouldn't be bothered with mobile payments even with a simple registration process'. In addition, Julia says 'touch and go is dead easy... although a mobile payment registration would probably put me off as it is another thing to do' whilst Edward says 'having to register for a mobile payment would detract from interest for me'. However, alternative perspectives on a mobile payment registration process include Freddie who says 'a simple registration is fine and it would not detract from my interest although... it would need to be an online registration'. In addition, Diana says 'registration would depend upon which organisation you are registering with as to whether it has an impact on my interest in mobile payments' whilst Isla says 'if you are going to use something regularly then going through the registration rigmarole and a one off setup is fine. So yes, that whole registration does detract a little bit'.

Furthermore, a number of interviewees identify that despite contactless payments being easy to use the lack of PIN authentication influences attitude including Edward who says 'I struggle to see how they can make contactless cards any easier to use but I never use the contactless facility and always enter my PIN to validate payment as it provides a level of security... a comfort factor with the PIN identifying me'. This is consistent with Julia who says 'I am happy entering my PIN for purchases as the PIN offers degree of security if my card is stolen. Fraudsters could make several purchases on tap and go (*contactless payment*) if my card is stolen which is a slight concern'. In addition, Alison says '(*contactless*) ease of use would be easy... but it is a little bit more secure if you have to enter your PIN' whilst Graham says '2 seconds to put in your PIN number is much more secure to me'.

6.3.2.8 Perceived Usefulness effect on Attitude

A number of interviewees indicate that perceived usefulness has an influence on attitude towards mobile payments, albeit the interviewees explain this in different ways.

A number of interviewees identify that the £30 upper limit for contactless payments is useful including Freddie who says 'the benefit of a £30 limit to manage risk from fraud losses is reasonable... a mobile payment would be useful when time is of the essence

although the actual time saving will be minimal but a shorter time may help catch a train'. This is consistent with Alison who says 'I can see why there's a £30 limit and it is low, but it is OK until I know they've got a more secure system in place... a mobile payment is possibly useful'. However this is inconsistent with Isla who says 'a contactless payment facility is not of interest as card payments are generally more than £30 and chip and PIN is not exactly time-consuming and it just makes me feel nervous'.

Furthermore, a number of interviewees identify that a choice of upper limit would be useful including Beccie who says 'mobile payments would be useful if the limit varied according to device type... with a higher risk then keep a lower limit set by consumer... mobile payment is of interest but only if the (*mobile payment*) provider can ensure security'. This device type usefulness is also identified by Hope who says 'the type of mobile payment device will determine the mobile payment amount; with contactless card for cash equivalent and a smart phone for larger value payments with increased security and control although the phone process can be slow'.

However, Diana says 'the flexibility to amend the limit to suit my own requirements would be of interest... but I have not used it (*contactless payment*) and I have no interest in using it as I don't see the advantage. I can't see a situation where it would be useful to me compared to sticking my card into a machine and entering my PIN' but then goes on to say 'on the London Underground with lots of people trying to do the same thing at the same time then that 15 seconds for entering the PIN counts'.

Furthermore, Julia says 'once they (*contactless payments*) are up and running and people are talking about it and saying it is useful then I'd start using it'. This is similar to Edward who says 'the convenience aspect could be the trigger for changing my payment habit but there's a contradiction in why I do certain payments'. Edward then goes on to identify that the smart phone functions don't replace the need for a wallet when he says 'the argument that the smart phone replaces a wallet doesn't work as I have lots of other things in my wallet like loyalty cards, photos, business cards, credit cards, debit cards, AA card and my driving license with my photo... I can see the perceived usefulness of a mobile payment on the M6 toll road or Liverpool tunnel

where you have to queue to change notes then select the coins and wait for coins to register’.

6.4 Data Validity and Reliability

When considering the reliability of the findings, new mobile payments knowledge is derived systematically and presented clearly in order to increase reliability despite any personal perspectives of the nature of reality (Hackley, 2003). Validity of the research findings is determined by an evaluation of “the trustworthiness of reported observations, interpretations and generalizations” (Mishler, 1990, p. 419) although interpretations are influenced by the construction of knowledge that occurs within a social framework. However, Silverman (1993, p. 275) suggests that “validity is another word for truth” and is the extent to which the research findings accurately reflect the phenomenon (Hammersley, 1992) and the interpretation of observations (Kirk & Miller, 1986). The research design and research administration are clearly defined so that they can be seen to be free from interference and contamination (LeCompte & Goetz, 1982). Furthermore, low inference descriptors are used to support the research findings identified in the interview data (Seale, 1999) whilst verbatim interview quotes are used to explain the findings (Johnson, 1997). Credibility, trustworthiness and dependability are established by clearly explaining the processes that are strictly followed (Lincoln & Guba, 1985). Factual accuracy of the findings is provided with no creativity or distortion of what is seen or heard (Huberman & Miles, 2002) whilst balancing the accuracy of what is included and what is excluded. However, accuracy is “a criterion relative to the purpose for which it is sought” which is both subjective and context dependent (Runciman, 1983, p. 97).

A detailed explanation is provided of the research process that is used to explore UK consumer perspectives of the mobile payments phenomenon. However, qualitative interview research is dynamic and can never be fully replicated (Holstein & Gubrium, 2011) although complete replication is an unrealistic expectation according to Seale (1999) and it is recognised and acknowledged that exactly the same process used in different situations may lead to different results (Becker, 1990). Applying each of the points identified above whilst undertaking this research, results in an increased validity

and reliability of the research findings (Flick, 2011). A comprehensive account is also provided of the research methods used together with a detailed description of the whole end-to-end research process in order to establish credibility of the research evidence (Hammersley & Atkinson, 2007; Holloway & Wheeler, 1996; Kvale, 1996). Reliability and integrity of the research findings are also achieved through critically reviewing the research process undertaken (O'Leary, 2004).

This mobile payments research only investigates what it actually set out to investigate as defined within the research statement and the research objectives which increases internal validity (Arksey & Knight, 1999) whilst ensuring that the research findings are not affected by instruments or procedures (LeCompte & Goetz, 1982). The research focus is a crucial aspect in interview interpretation (Dean & Whyte, 1958; Dexter, 1970) although each interview only occurs for a short period of time from which interpretations are made (Huberman & Miles, 2002). Furthermore, data is obtained from a small consumer sample which negates the application of these findings to other groups and to generalisation across different social settings (Lincoln & Guba, 1985) that creates an external validity issue (LeCompte & Goetz, 1982). However, a wider representation of the qualitative interview findings is less important (Pole & Lampard, 2002) as internal validity is far more important according to Huberman and Miles (2002). In addition, Phillips (1987) suggests that there is no clearly defined process that can be used in the analysis of qualitative interview data to produce valid findings whilst validity is "not a commodity that can be purchased with techniques... rather, validity is like integrity... to be assessed relative to purposes and circumstances" (Brinberg & McGrath, 1985, p. 13). The nature of each interview situation is key to the validity of the knowledge created as different perspectives may be obtained in other situations (Briggs, 1986; Mishler, 1986).

The reliability of the research findings is also influenced by the small research data sample obtained through 101 questionnaires and 10 semi-structured interviews. This sample size negates the application of the findings to other groups and to generalisation across different social settings (Lincoln & Guba, 1985) whilst the new knowledge created has a limited application to the wider community although this was never the intention (Ritchie, Lewis & Elam, 2003).

Both research instruments have English as the language of communication which is the predominant language used in the UK and on the internet, and as a result, internet responses reflect the values of those who use this technology (Oliver, 2010). Validity and reliability also results from a solidity of meaning and interpretation of the data although this is a complicated and opaque process as there are no agreed or precise methods for teasing out themes that can lead to an objective understanding (Macpherson, 2008). In addition, claims of bias are difficult to refute as the complete data collection process is only visible to the researcher whilst accuracy and completeness is predominantly a subjective perspective (Payne & Payne, 2004).

6.5 Summary

This chapter provided a comprehensive account of the numerical data analysis undertaken on the questionnaire data and the narrative analysis undertaken on the interview data (Hammersley & Atkinson, 2007). The data analysis identifies meaning from the empirical data that is collected from UK participants (Bogdan & Biklen, 1982; Ghauri & Gronhaug, 2010) that are presented as research findings and contextualised within the existing body of literature on the phenomenon. The chapter went on to review the data validity and reliability that includes the data analysis that is undertaken as this establishes the basis for the subsequent validity and reliability of the research findings (Hammersley & Atkinson, 2007).

The next chapter reviews the research findings that are identified based upon the justified post-positivist philosophical position with a social constructionist ontology and following stringent application of the research design and research administration for the collection and assessment of the empirical data. The next chapter goes on to review the key questions and interview facts before each individual research proposition is reviewed and discussed within the existing body of knowledge on the mobile payments phenomenon.

7. Research Findings and Discussion

7.1 Introduction

In the previous chapter the numerical data analysis of the quantitative questionnaire data was clearly explained and this was then followed by a clear explanation of the narrative and text content data analysis of the qualitative interview data as this establishes the basis for the data validity and reliability (Flick, 2011). The chapter concluded by identifying that data validity and reliability of the findings is achieved through the detailed descriptions of the processes that are documented and accurately followed when undertaking the empirical data analysis.

This chapter presents and reviews the research findings that are identified from the empirical data following application of the research philosophy, the research position, the research strategy, the research design and administration of the research instruments before reviewing the individual research propositions. The research findings are presented in a consistent and accurate manner for each of the individual research propositions (Patton, 2002) before the chapter provides a summary of the research findings. The chapter concludes with the presentation of a mobile payments road map that shows how the UK consumer adoption of the mobile payments phenomenon has evolved over the last 2 years before providing a chapter summary.

The key theoretical positions that this research takes for each of the three sections of this chapter is shown in Figure 19 - Research Findings and Discussion below:

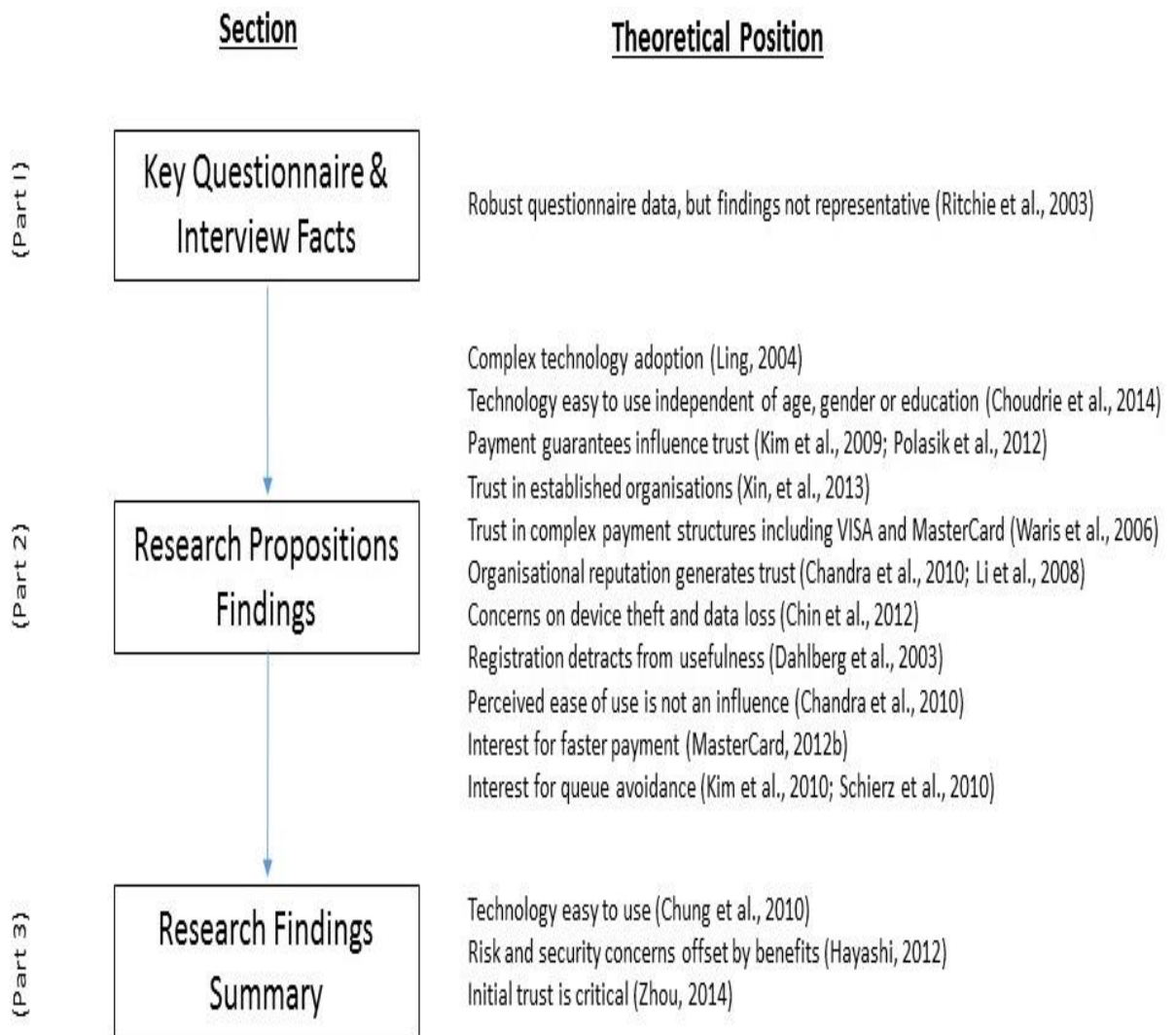


Figure 19 - Research Findings and Discussion

This research identifies that age, educational qualifications and gender are no longer key influences of UK consumer perspectives of mobile payments which is contrary to previous research (Amirkhani et al., 2011; Luarn & Lin, 2005; Meuter et al., 2003; Saaksjarvi, 2003). Furthermore, whilst UK consumers have risk and security concerns the perceived benefit of mobile payments can overcome these concerns when the benefits are clearly recognised and understood (Hayashi, 2012; Kim et al., 2010; Schierz et al., 2010).

7.2 Questionnaire and Interview Facts

A broad range of questionnaire and interview data is obtained from 101 questionnaires and 10 semi-structured interviews although non-respondent data may influence the research findings (Bryman, 2012; Quinlan, 2011). A range of participant data is obtained as shown in the Table 1 - Respondent Data below:

		<u>Questionnaire</u>	<u>Interview</u>
Age	16-24	3	1
	25-34	5	0
	35-44	25	1
	45-54	30	4
	55-64	20	3
	65+	18	1
	Total	101	10
Gender	Male	51	4
	Female	48	6
	Not Disclosed	2	0
	Total	101	10
Education	GCSE/O Levels	13	2
	A levels	13	1
	BA/BSc	25	1
	Post-Grad	45	6
	Prefer not to say	5	0
	Total	101	10

Table 1 - Respondent Data

Whilst questionnaire data is obtained from 120 participants, 15 of these are non-UK participants and are excluded which is consistent with the research aims and objectives of exploring the mobile payments phenomenon with UK based consumers. In addition, 4 questionnaires have a large number of incomplete questions and are excluded although there is nothing unusual in these partly completed questionnaires. The questionnaire respondent age distribution shows that the majority of the responses

are received from the older age groups whilst the majority of questionnaire respondents and interview participants have a graduate or post-graduate degree.

Previous research identifies that age is one of the most important demographic characteristics that influence consumer behaviour (Venkatesh et al., 2003) whilst younger consumers have more interest in mobile services (Kleijnen et al., 2004) and online banking (Calisir & Gumussoy, 2008). Furthermore, younger consumers are usually early adopters of innovative technologies (Luo, 2009) and age is an influence on technology adoption (Dahlberg & Oorni, 2006; Venkatesh et al., 2003) including mobile wallet adoption (Shin, 2009). As this respondent data has an older age range bias, any age related findings on UK consumer attitude towards mobile payments and mobile payment technology adoption are more robust.

Previous research also identifies that the educational level of a consumer is an important influence on perceived ease of use of technology (Agarwal & Prasad, 1999; Carow & Staten, 1999; Venkatesh et al., 2003) and technology adoption (Wejnert, 2002) as a higher education provides an increased knowledge base that is used to assess innovation adoption (Hambrick & Mason, 1984). In addition, educational levels are identified as a critical differentiating factor as consumers with higher education levels are more likely to be innovators or early adopters (Rogers, 2010). However, other research identifies that a consumer education level has no influence on consumer attitude towards the use of a smart phone (Osman et al., 2011) and has no influence with online and mobile banking adoption (Laforet & Li, 2005; Lassar et al., 2005). Consequently, whilst the non-respondent base may have included consumers with lower educational qualifications, it is believed that the questionnaire and interview respondent data that is obtained and analysed from which the research findings arise is broadly representative of the universe of enquiry.

Out of 120 respondents who completed the questionnaire, 63 were obtained in a face to face environment, 41 obtained electronically through LinkedIn and 16 obtained electronically through Facebook. Of the 57 responses received electronically, 15 responses were from non-UK residents so no data was collected and these are not included in the subsequent analysis as identified earlier.

However, 5 respondents who completed the paper questionnaire did not answer one question although the remaining questions were answered and the research data from these 5 respondents is included in the research population of 101 responses on which detailed analysis is undertaken. Out of the 101 useable responses 51 are male, 48 female and 2 respondents did not to declare their gender.

A cross-section of respondents provide research questionnaire data by completing a traditional paper questionnaire or an electronic questionnaire, albeit those respondents who completed the electronic questionnaire need a PC with internet access. In addition, a number of respondents have previously shown an interest in mobile payments by joining specific mobile payment groups on LinkedIn through self-categorisation (Chiang, Suen & Hsiao, 2013). A range of demographic characteristics are obtained from the cross-section of questionnaire respondents which provides a generally representative sample of the target population, albeit with a limited numbers of respondents. As a result, the research questionnaire population used is valid and the findings on the questionnaire data are robust, but these findings may not reflect the views of the wider UK adult population (Ritchie et al., 2003), although this was never the intention of this research.

The questionnaire responses provide a range of consumer age data although there is a 78% predominance of respondents in three age groups aged 35 to 44; 45 to 54 and 55 to 64 with just 8% of respondents in two age groups aged 16 to 24 and 25 to 34. There are 31.7% of respondents aged 45 to 54 years compared to 17.4% for the UK adult population; 3.0% of the respondents aged 16 to 24 years old compared to 14.5% in the UK adult population; and 5.0% of respondents aged 25 to 34 years old compared to 16.8% of the UK adult population as shown in Chart 2 - UK Adults and Questionnaire Respondent Age Distribution below:

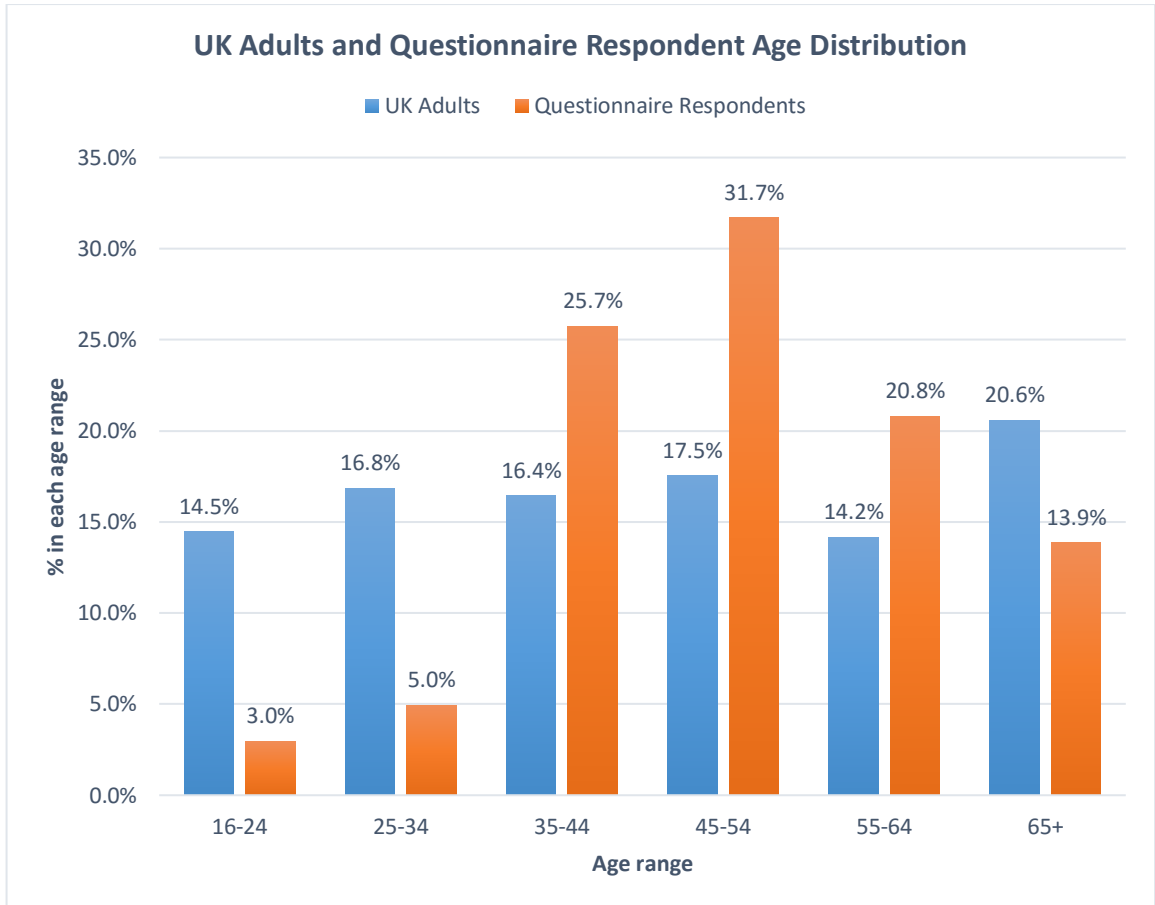


Chart 2 - UK Adults and Questionnaire Respondent Age Distribution

The questionnaire responses also provide a variety of consumer educational qualification data with 24.8% of respondents holding a 1st degree whilst the respondent educational qualification profile has a predominance of consumers with one or more degree qualifications at 69.4% as shown in Chart 3 - Questionnaire Respondent Educational Qualifications below:

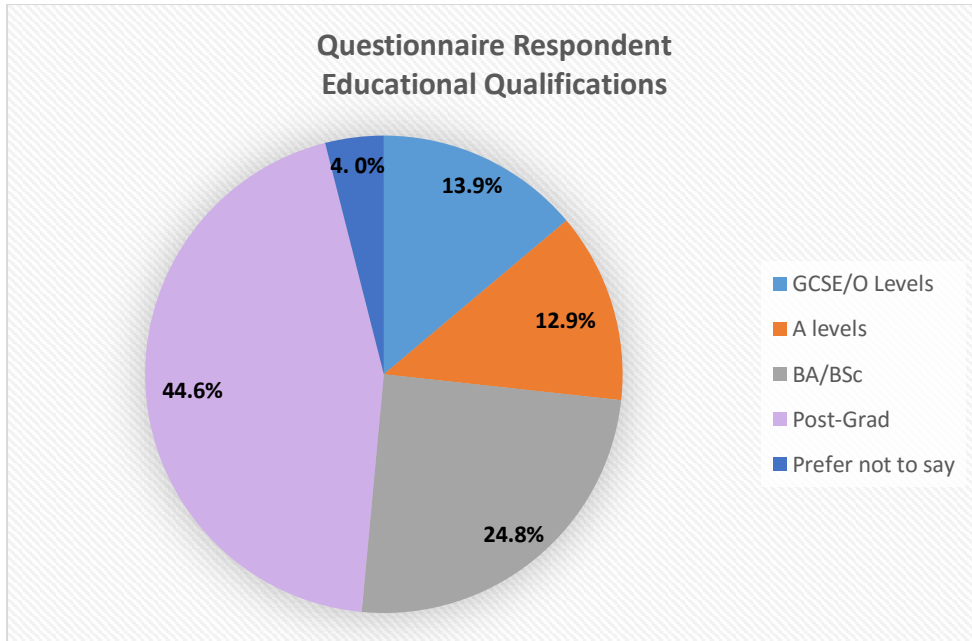


Chart 3 - Questionnaire Respondent Educational Qualifications

There is a predominance of respondents with one or more degree qualifications at 69.4% compared to 27.2% % of the adult population in England and Wales (ONS, 2014c). In addition, 22.7% of the adult population in England and Wales have no qualifications whereas all the questionnaire respondents indicated a variety of educational qualifications, excluding the 4 respondents who indicated ‘prefer not to say’ as shown in Chart 4 - England & Wales Adult Educational Qualifications below:

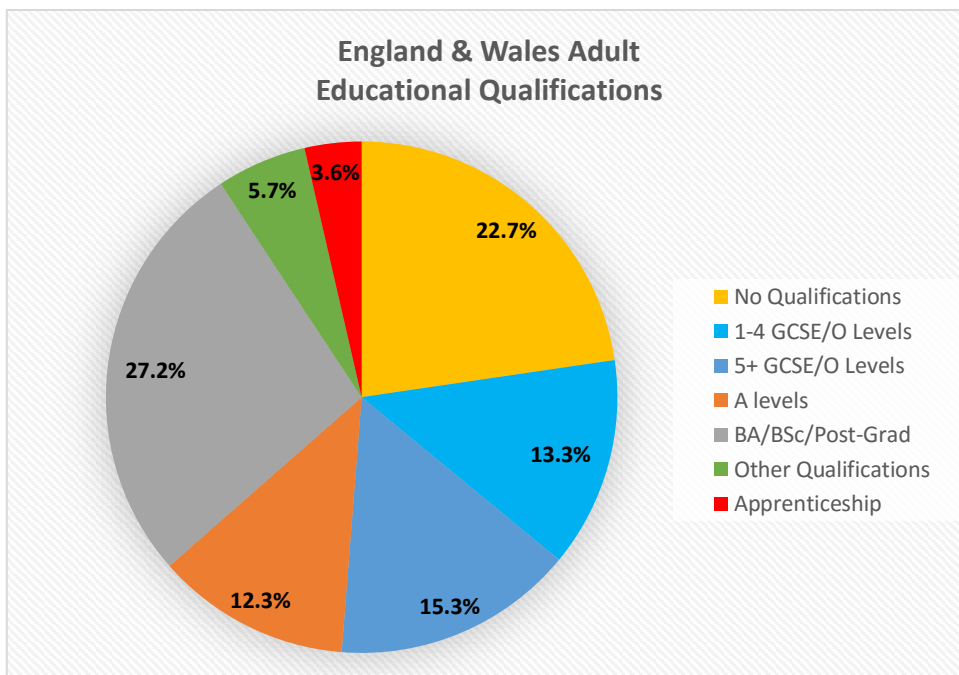


Chart 4 - England & Wales Adult Educational Qualifications

In addition, 10 purposeful interviews are undertaken face to face in a convenient and quiet location so that each participant feels safe and secure (Bryman, 2012; Quinlan, 2011). The interviewees have an age range of 18 years old to 76 years old with a predominance (80%) aged 45 and over, whilst 50% of the interviewees hold a post graduate degree qualification. A cross-section of interview respondents is obtained with a range of demographic characteristics as shown in Table 1 - Respondent Data above. This produces a generally representative sample of the target population, albeit with a relatively small interview base and a predominance of interviewees in the older age groups and with post-graduate degree qualifications. As a result, the research interview population used is valid and the findings on the interview data are robust but may not reflect the views of the wider UK adult population (Ritchie et al., 2003), although this was never the intention of this research.

7.3 Research Proposition Findings

Out of the eight research propositions justified and explored in the conceptual model four of the research propositions are generally not supported or not widely supported following the analysis of the questionnaire and interview data and these are:

- Personal characteristics have a positive effect on the perceived ease of use of mobile payments for UK consumers.
- Personal characteristics have a positive effect on the perceived usefulness of mobile payments for UK consumers.
- Perceived ease of use has a positive effect on the perceived usefulness of mobile payments.
- Perceived ease of use has a positive effect on UK consumer attitude to mobile payments.

However, four of the research propositions justified and explored in the conceptual model are generally supported following the analysis of the questionnaire and interview data and these are:

- Perceived trust has a positive effect on the perceived usefulness of mobile payments.

- Perceived trust of a bank by UK consumers will be higher than perceived trust of other mobile payment providers due to reduced perceived risk.
- Perceived risk has a negative effect on the perceived usefulness of mobile payments.
- Perceived usefulness has a positive effect on UK consumer attitude to mobile payments.

Each of the research propositions is reviewed in detail and contextualised within the body of knowledge that is available in the following sections:

7.3.1 Research proposition 1. Personal characteristics have a positive effect on the perceived ease of use of mobile payments for UK consumers.

When considering technology, the majority of questionnaire respondents perceive technology is easy to use regardless of age, gender or education levels which is inconsistent with previous research where consumers perceive computers, the internet and technology as hard to use (Chang et al., 2009; Fain & Roberts, 1997; Kleijnen et al, 2009; Shin, 2009). This paradigm shift on consumer perception of technology as easy to use may be a result of the recent widespread adoption of consumer focussed technology devices that are now an integral part of today's society (Drucker, 2011).

95% of questionnaire respondents agree that technology is easy to use in varying degrees (excluding one respondent who did not have a PC or tablet computer) with a mean average of 5.29. In addition, 76% of the respondents agree that mobile phone technology is easy to use in varying degrees with a mean average of 4.97 whilst 75% agree that a smart phone is easy to use in varying degrees.

Furthermore, the questionnaire findings are broadly consistent with the interview findings as the majority of interviewees also perceive technology is easy to use including Beccie who says 'I have the latest iPhone 5 (*smart phone*) which is very easy to use'. In addition, Freddie says 'I find it (*technology*) quite easy (*to use*) ... and various technologies don't faze me'; Charlie says 'I'm using technology all the time and I am very comfortable with it... I find technology quite intuitive'; Alison states that she is 'not

frightened of technology'; Hope indicates that she is 'technically savvy'; and Julia indicates that she is 'happy setting up a new computer... technology doesn't scare... me'.

Complex technology devices have been adopted by consumers world-wide (Ling, 2004) and as a result, consumer adoption of complex technology devices is now an integral part of today's society (Drucker, 2011). Meanwhile, companies have developed consumer focussed technology devices that now include smart phones, tablet computers, watches and glasses (Apple, 2014a; Google, 2014; Little, 2011; Samsung, 2014; Swatch, 2015).

The technology ease of use findings are in contrast to previous research which identified that consumers believe that technology is complex and difficult to use (Amirkhani et al., 2011; Luarn & Lin, 2005; Saaksjarvi, 2003). This change in consumer perception of technology may be a result of consumer technology devices becoming an integral part of today's society (Drucker, 2011). The extensive adoption of consumer based technology together with self-service technology (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005) positively influences perceived ease of use of technology that may provide an explanation for these divergent perceptions compared to previous research. Furthermore, multiple technology device adoption by consumers also positively influences perceived ease of use that occurs from cross-technology device influence (van Hove, 2004) which may also provide a further explanation for the divergent consumer perspectives of technology ease of use.

When considering smart phones it is recognised that these are complex technology devices (uSwitch, 2015) that have been adopted by consumers world-wide (IDC, 2015; Ling, 2004) and are generally regarded as easy to use independent of age, gender or education levels. 94% of questionnaire respondents indicate that mobile phone technology is easy to use in varying degrees, whilst 75% of the questionnaire respondents indicate that a smart phone is easy to use which is inconsistent with Chang et al. (2009) who suggest that mobile phone applications and services are too complex. However, 10% of the respondents indicate that a smart phone is not easy to use

although all these respondents are aged 45 and over, whilst 6 out of these 10 respondents are aged 65.

Kim et al. (2011) suggest that there is an age based digital divide with consumers who adopt or don't adopt technology whilst van Biljon and Kotze (2008) suggest that age influences mobile phone usage although the digital divide based upon the age of UK consumers has significantly narrowed. UK consumer age now has a minor influence on smart phone ease of use which is consistent with Choudrie et al. (2014) who suggest that older consumers are adopting technology, albeit not necessarily at the same pace as the younger consumers and despite older consumers having difficulties when adopting novel technologies (Lee, Chen & Hewitt, 2011).

The questionnaire findings on smart phone ease of use are broadly consistent with the interview findings including Beccie who says 'I am not a young techie so it took me about 3 weeks to get used to new smart phone navigation and to get it to do what I want in day to day use... but now it is very good and easy to use'. In addition, Isla says 'I am pretty good with my mobile phone... I don't remember it (*iPhone 5 setup*) being difficult. It is just the touch (*screen*) being the main difference for me' whilst Graham says that 'technology is outside my comfort zone but I can generally speaking work things out to the level that I need to do it. I am certainly not a technical person but I setup the (*smart*) phones myself'. As identified above, UK consumer perceptions of smart phone ease of use are consistent with BuzzCity (2014) although inconsistent with van Biljon and Kotze (2008).

Perceived ease of use is one of a number of key adoption drivers for mobile payments using a smart phone device according to Chang et al. (2009). In addition, perceived ease of use of a smart phone has a direct and positive effect on a consumer's attitude and is more pronounced than the effect of perceived usefulness according to Chen et al. (2011). The wide-spread adoption of consumer based technologies together with self-service technology adoption (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005) has resulted in complex consumer focussed technologies becoming an integral part of today's society (Drucker, 2011). This may provide an explanation for the divergent consumer perspectives of smart phone ease of use compared to previous research.

Furthermore, as consumers upgrade their smart phone device for a later model, this upgrade can also positively influence perceived ease of use which may provide a further explanation for the divergent consumer perspectives of smart phone ease of use.

When considering Internet banking it is recognised that internet banking is generally regarded as easy to use independent of age, gender or educational qualifications which is consistent with British Bankers Association (2015) and Calisir and Gumussoy (2008). 79% of questionnaire respondents indicate that internet banking is easy to use in varying degrees, although 7% of the respondents indicate that internet banking is not easy to use. However, all interviewees indicated that they use internet banking which suggests that age now has a minor influence on internet banking ease of use. This is generally inconsistent with other research including Karjaluoto, Jarvenpaa and Kauppi (2009) who identified that young people are more inclined to adopt internet banking in Finland and Yuen (2013) who identified that Malaysian females have a substantially increased intention to use Internet banking.

The extensive adoption of consumer based technology (IDC, 2015; Ling, 2004) together with self-service technology adoption (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005) may provide the positive influences on UK consumer perceptions of internet banking that account for these findings compared to previous research. Furthermore, UK consumers with multiple technology devices (van Hove, 2004) may well have positive perceptions of ease of use as a result of cross-technology device influence as previous positive experiences with self-service technology can inspire use of other self-service devices (Wang et al., 2012). As a result, these consumers are more likely to use internet banking that is also regarded as easy to use which is consistent with Parasuraman and Colby (2007).

When considering age characteristics, a variety of age ranges are obtained in the questionnaire responses whilst the interviewee ages range from Freddie aged 18 through to Alison aged 76. Alison indicates that whilst she is 'not frightened of technology, it takes me longer to get there than it probably would if I was 20', whilst Edward says 'my family have... several portable technology devices... if I had to I would

(*fix it*) but others can fix it in a tenth of the time it would take me'. This is consistent with Beccie who says 'I can follow the instructions but... I would prefer somebody to set it up for me and then I know it's done'.

Age has been identified as an important characteristic that affects perceived ease of use and technology adoption (Morris & Venkatesh, 2000; Morris et al., 2005; Venkatesh et al., 2003); innovative technologies (Luo, 2009); mobile wallet adoption (Shin, 2009); online banking (Calisir & Gumussoy, 2008); and mobile banking (Sraeel, 2006; Yao & Zhong, 2011). The questionnaire and interview findings generally confirm that UK consumers perceive technology and smart phones as easy to use regardless of age characteristics, with one exception in the older age group. This is consistent with Chung et al. (2010) and with British Bankers Association (2015) although age is identified as a minor influence on internet banking. However, Barclaycard (2015b) identify that contactless card technology is being embraced by UK consumers regardless of age or gender.

Previous research has established that younger consumers adopt technology faster than older age groups (Calisir & Gumussoy, 2008; Luo, 2009; Sraeel, 2006; Venkatesh et al., 2003; Yao & Zhong, 2011). However, this research identifies that a number of older consumers will use younger individuals for a more expeditious technology resolution which is consistent with Liebana-Cabanillas et al. (2014) and Luo (2009). Consumers who initially adopted technology at the start of the 21st century are now at least 15 years older. All individuals grow older with time and as a result, the influence of age on perceived ease of use and technology adoption automatically decreases over time. Consumer based technology is now an integral part of society (Drucker, 2011) with extensive adoption of consumer based technology (IDC, 2015; Ling, 2004) together with self-service technology adoption (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005). This widespread adoption of complex technology in society may explain why these research findings identify that age characteristics have substantially less influence on perceived ease of use compared to previous research.

When considering educational qualifications, it is noted that education levels have previously been identified as an important personal characteristic that affect perceived

ease of use and technology adoption (Agarwal & Prasad, 1999; Carow & Staten, 1999; Venkatesh et al., 2003). Both the questionnaire and interview findings generally confirm that UK consumers perceive technology and smart phones as easy to use regardless of educational qualifications. However, 4 out of the 5 respondents who disagree in varying degrees that technology is easy to use do not have a university degree or post-graduate qualification. Only Graham indicates a negative perspective of technology when he says 'there are certain kinds of technical devices that I have no interest whatsoever in understanding or learning how they work'.

Previous research identifies that a higher education level provides increased skills, knowledge, and cognitive base which are used to assess innovation adoption (Hambrick & Mason, 1984; Wejnert, 2002). Education levels are also positively associated with technology adoption (Agarwal & Prasad, 1999; Carow & Staten, 1999; Venkatesh et al, 2003). Education is identified as a critical differentiating factor with higher education levels more likely to be innovators or early adopters (Rogers, 2010). However, these research findings are consistent with other research including Osman et al. (2011) who found no major correlation between education level and attitude for smart phone use with Malaysian consumers; Lassar et al. (2005) who found no correlation between education level and online banking adoption for consumers in eastern USA; and Laforet and Li (2005) who found that education levels have no influence on Chinese consumers for online and mobile banking adoption.

Consumer based technology is now an integral part of society (Drucker, 2011) with extensive adoption of consumer based technology (IDC, 2015; Ling, 2004) together with self-service technology adoption (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005). This widespread adoption of complex technology in society increases the skills, knowledge and cognitive base of consumers which may explain why these research findings identify that education levels have substantially less influence on perceived ease of use compared to previous research.

In summary, the majority of UK consumers perceive that technology is easy to use; a smart phone is easy to use; a mobile phone is easy to use and internet banking is easy to use and are adopted by a large number of the participants regardless of age, gender

and educational qualifications. These findings are a significant divergence from previous research that identified individual consumer aspects of age, gender and educational qualifications influence perceived ease of use (Agarwal & Prasad, 1999; Shin, 2009). However, consumer based technology is now an integral part of society (Drucker, 2011) through extensive adoption of consumer based technology (IDC, 2015; Ling, 2004) and self-service technology adoption (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005). This widespread adoption of complex technology may explain why individual characteristics of age, gender and educational qualifications may no longer be differentiation factors on perceived ease of use for UK consumers. In addition, previous experience of consumer based technology and self-service technology generates a more positive attitude towards technology adoption (Agarwal & Prasad, 1997; Thong, Hong & Tam, 2006) which may also explain why age, gender and educational qualifications are less influential on perceived ease of use. As a result, research proposition 1, which proposes that personal characteristics have a positive effect on the perceived ease of use of mobile payments for UK consumers, is not supported.

7.3.2 Research proposition 2. Personal characteristics have a positive effect on the perceived usefulness of mobile payments for UK consumers.

Consumer awareness of mobile wallets and contactless payments is the essential first step towards adoption (Claudy et al., 2010; Howcroft et al., 2002; Pikkarainen et al., 2006; Sathye, 1999) and 79% of questionnaire respondents indicate that they have heard of contactless payments whilst 81% have seen the contactless payment symbol. However, only 43% of questionnaire respondents have heard of mobile wallets which is consistent with Bamasak (2011) who identifies that only 42% of Saudi Arabian consumers have heard of mobile payments. The questionnaire findings on mobile wallets and contactless payments are generally consistent with the interview findings as a number of interviewees indicate that they have heard of contactless payments including Diana who says 'I have heard of contactless payments'. In addition, Charlie indicates that he has already adopted contactless payments when he says 'I have used

contactless payments twice so far' whilst Isla says 'I am not aware of contactless payments'.

Whilst awareness of the mobile payment instrument is a pre-requisite to adoption, consumers also need to know where the payment instrument can be used (Claudy et al., 2010; Howcroft et al., 2002; Pikkarainen et al., 2006; Rogers & Shoemaker, 1971; Sathye, 1999). This is consistent with Freddie who indicates he is aware of contactless payments but then says 'I have not seen any machine in the UK that takes contactless payments'. There is a lack of UK consumer awareness of mobile wallets as only 43% of respondents indicate that they have heard of mobile wallets although contactless payment awareness is higher than mobile payments, but 21% of respondents still indicate a lack of awareness of contactless payments.

These findings on awareness are consistent with ApplePay (2015b) where 75% of consumers indicated that they have not seen any Apple Pay points or symbols. In addition, BuzzCity (2014) identify that 29% of consumers do not believe their bank provides mobile banking services whilst VocaLink (2015a) identify that 34% of the UK population are not aware of mobile payments. However, any increased awareness of mobile wallets and contactless payments still requires consumer apathy to be overcome and transferred into consumer interest in order to subsequently achieve adoption (Viehland & Leong, 2007). These findings are inconsistent with consumer findings in other countries including Canada where 20% of North American shoppers actually use mobile wallets (Canadian Imperial Bank of Commerce, 2014); Japan where 92.9% of consumers are aware of their mobile phone's electronic wallet capability (Amoroso & Magnier-Watanabe, 2012; Wall Street Journal, 2011); Asia where mobile wallets have already become a mainstream phenomenon (Yang, 2005); and Spain where BBVA (2014) have been successful with 250,000 mobile wallet downloads undertaken between December 2013 and August 2014.

UK adoption of mobile payments begins when consumers become aware of the product (Rogers & Shoemaker, 1971). As a result, mobile payment organisations need to focus on increasing consumer awareness of mobile payments, although as UK banks commence the full scale roll out of mobile wallets (Finextra, 2015) this will increase

consumer awareness. Increased awareness will also occur when smart phone manufacturers integrate mobile wallet capabilities into their latest handsets and Apple, Google and Samsung are the latest payments market entrants with ApplePay (2015a), AndroidPay (2015) and SamsungPay (2015a) that have launched in different countries.

Smart phone handsets that include mobile wallet capability require the consumer to setup and configure the mobile wallet prior to actually making a mobile payment (ApplePay, 2015a; Ding & Unnithan, 2005; Kreyer et al., 2003). This requires additional consumer operations which are a further barrier to perceived usefulness and subsequent adoption (Antovski & Gusev 2003; Dewan & Chen 2005; Ondrus & Pigneur, 2005; Pousttchi & Zenker 2003). In addition, smart phone handset navigation is required to setup the mobile wallet which is a key influence on user behaviour and perceptions according to McDonald and Schvaneveldt (1998).

When considering smart phones, a broad spectrum of interview perspectives is identified on the perceived usefulness of mobile payments whilst a few interviewees indicate no perceived usefulness of mobile payments including Alison who says 'ease of use would be easy but risks outweigh the usefulness'. In addition, Graham says 'I have no interest in that (*mobile payments*) personally as it has no usefulness for me'. However, other interviewees identify the perceived usefulness of mobile payments including Julia who says she is 'comfortable with the perceived usefulness of mobile payments' and Freddie who says 'mobile payments would be useful as time is of the essence in payments at point-of-sale although the actual time-saving will be minimal; but shorter time may help to catch a train'. A positive consumer perspective of the perceived usefulness of smart phones leads to adoption (Adams et al., 1992; Ajzen, 1991; Davis, 1989; Davis et al., 1989; Segars & Grover, 1993) although the widespread adoption of smart phones (IDC, 2015; Ling, 2004) does not necessarily lead to adoption of mobile payments or the use of Apps on the smart phone (Zhou et al., 2014). Furthermore, it is the younger interviewees who generally indicate a more positive perspective of perceived usefulness of mobile payments. This is consistent with Choudrie et al. (2014) who identify that 93.1% of consumers aged less than 50 years old were smart phone users whereas only 63.3% of consumers aged 50 and over were

smart phone users. However, Xin et al. (2013) identify that consumers with mobile banking experience have a stronger intention towards mobile payments.

A broad spectrum of security perspectives from interviewees is identified on perceived usefulness including Hope who says 'I have concerns at using the (*smart*) phone for mobile payments with the phone on view as this may lead to me being targeted and the phone being stolen' which is consistent with Shin (2009). However this perspective is in contrast to Beccie who says she has 'no concern of using a (*smart*) phone for making a payment as it is just like getting your wallet out'. Consumers who replace their mobile phones will increase adoption of smart phone handsets across all age groups, although older consumers are slower at adopting the extended functionality of a smart phone (Choudrie et al., 2014).

Furthermore, a number of interviewees identify that mobile payments have an increased security risk with no PIN authentication which is a further barrier to adoption. Mobile payments are assessed against a number of other payment options which include the use of an EMV smart card as a payment device at point of sale that requires PIN authentication (King, 2012). The perceived usefulness of a mobile payment is negatively affected by the increased security risks compared to making a payment using an EMV card with PIN authentication as identified by Diana who says 'I can't see a situation where it (*mobile payment*) would be useful to me compared to sticking my card into a machine and entering my PIN'. In addition, Graham says 'If the PIN entry was 15 minutes then I would assess risk and reward and may take a chance (*at using mobile payment*)'. As a result, mobile payment organisations will need to address the consumer perceptions of increased security risks compared to the use of PIN authenticated payments.

When considering other devices, the perceived usefulness of each technology device is a pre-requisite to subsequent adoption of that device (Adams, Nelson, & Todd, 1992; Ajzen, 1991; Davis, 1989; Davis et al., 1989; Segars & Grover, 1993). This is supported by Charlie who says 'I use different technology devices for specific functions all the time and am very comfortable with it' and then goes on to say 'I have used contactless card payments twice... (*but I am*) in the stage of getting used to contactless payments as it

is not a natural thing for me to do'. Meanwhile Isla states that 'I think you have to adapt and adopt technology now'. Whilst the importance of perceived usefulness applies across all technology devices, not all interviewees have an interest in multiple technology devices including Graham who says 'there are certain kinds of technical devices that I have no interest whatsoever in understanding or learning how they work (as) I am comfortable with what I use. I am interested in technology to the point where I am able to do the things I wish to do and if someone says there's a better way of doing it I'd have to be convinced it is a better way and it (*mobile payments*) doesn't do any of those'.

Isla identifies concerns at overspending as a result of mobile payment adoption when she says 'I'd rather have the money in my pocket as it would be too easy to spend, spend, spend' and risk negatively influences perceived usefulness which is consistent with Mallat (2007). However, this increased spending is not a new phenomenon but has a greater influence with the increased adoption of various electronic payment instruments (Cole, 1998; Feinberg, 1986; Tokunaga, 1993), although consumer risk perceptions of overspending differ post-adoption according to Thornton and White (2001).

The UK consumer perspectives on perceived usefulness of technology are in contrast with previous research that identifies negative perspectives of technology (Meuter et al., 2003) as well as identifying technology is complex and difficult to use (Amirkhani et al., 2011; Luarn & Lin, 2005; Saaksjarvi, 2003). This change in UK consumer perception of technology may be a result of the recent widespread adoption of consumer based technology together with self-service technology adoption (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005) whilst technology has become an integral part of today's society (Drucker, 2011).

When considering internet banking personal characteristics influence the perceived usefulness according to Karjaluoto et al. (2009) who identify that young people are more inclined to adopt internet banking in Finland. Internet banking adoption is popular with young consumers in Turkey (Calisir & Gumussoy, 2008) whilst Yuen (2013)

identifies that females in Malaysia have a substantially higher intention to use Internet banking.

Internet banking is used by 79% of questionnaire respondents whilst all interviewees indicate that they use internet banking, including Edward who says 'I have used internet banking for over a year'. In addition, Charlie says 'virtually every day I am online to my bank account'. However, ONS (2014a) identify that 53% of UK consumers have used Internet banking in the last three months although there is a large age-based disparity with 71% of those aged 25 to 34 years old using Internet banking compared to just 23% of those aged 65 years old and over.

The UK consumer perspectives of internet banking support the perceived usefulness although none of the personal characteristics influence perceived usefulness which is inconsistent with ONS (2014a). The diversity of UK consumer findings identified in this research for internet banking may be due to the questionnaire and interview respondent age profiles and the higher percentage of respondents with a degree or post-graduate degree.

In summary, the perceived usefulness of technology, a smart phone and internet banking is supported by the majority of UK consumers and these are adopted by a large number of the participants regardless of age, gender and educational qualifications.

These findings are a significant divergence from previous research that identified individual consumer aspects of age, gender and educational qualifications influence perceived usefulness (Carow & Staten, 1999; Koenig-Lewis et al., 2010; Riquelme & Rios, 2010; Rouibah, 2009). However, consumer based technology is now an integral part of society (Drucker, 2011) through extensive adoption of consumer based technology (IDC, 2015; Ling, 2004) and self-service technology adoption (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005). This widespread adoption of complex technology may explain why individual characteristics of age, gender and educational qualifications may no longer be differentiation factors on perceived usefulness for UK consumers. In addition, previous experience of consumer based technology and self-service technology generates a more positive attitude towards technology adoption (Agarwal & Prasad, 1997; Thong, Hong & Tam, 2006) which may also explain why age,

gender and educational qualifications are less influential on perceived usefulness. As a result, research proposition 2, which proposes that personal characteristics have a positive effect on the perceived usefulness of mobile payments for UK consumers, is not widely supported.

7.3.3 Research proposition 3. Perceived ease of use has a positive effect on the perceived usefulness of mobile payments for UK consumers.

When considering ease of use, previous research has found that perceived ease of use has a positive effect on perceived usefulness including Gu et al. (2009) for WooriBank's mobile banking service in South Korea; Luarn and Lin (2005) for mobile banking consumers in Taiwan; and Wu and Wang (2005) for mobile commerce consumers in Taiwan. This is consistent with the questionnaire respondents where 88% anticipate that making a mobile payment will be easy in various forms with a mean average of 4.85 although a disparate set of responses are obtained from the interviewees.

A number of interviewee responses are consistent with the questionnaire findings that show a positive relationship between perceived ease of use and perceived usefulness of mobile payments including Beccie who says 'perceived ease of use will be very easy and perceived usefulness is of interest'. In addition, Edward identifies a specific transport scenario when he says 'the perceived usefulness of mobile payments at... Liverpool tunnel *as* you have to queue to change notes, then select the coins and wait for those to register'. This perspective is also consistent with Freddie who says 'perceived ease of use is generally the same across all technology devices and systems' whilst with Julia says that she 'is comfortable with mobile payments'. Charlie states that he has 'no concerns on perceived ease of use (*of mobile payments*) before going on to say 'I have used contactless payments twice so far... although it takes some initial getting used to'. Charlie's perspective is consistent with Chau and Lai (2003) where perceived ease of use has a positive effect on perceived usefulness for internet banking consumers in Hong Kong.

However, a number of interviewees indicate negative perspectives of perceived ease of use on perceived usefulness with mobile payments in various forms. Edward indicates awareness of contactless payments but identifies security concerns when he

says 'I never use the contactless facility as I always enter PIN to validate a payment even though I am aware of touch and go but security of PIN entry provides a level of security'. This security concern compared to PIN authentication is also identified by Julia who says 'I am happy with PIN for purchases'. Alison says 'without a PIN there has to be a risk' and then goes on to say 'I am OK on my mobile phone... but risks outweigh the usefulness'. In addition Charlie says '*(it takes only)* 2 seconds to put in your PIN number and that to me is much more secure'. UK consumers identify that PIN authentication of payment transactions adds a high degree of security to the payment exchange and protects the consumer against fraudulent transactions which is consistent with Ward (2006).

Furthermore, Alison goes on to say 'my experience... would make me very doubtful about something small that you could lose'. In addition, Freddie says 'my main concern is of stolen device and a fraudster can then just touch and go without any other control even with multiple transactions with small transaction values'. Graham also expresses this concern when he says '*(contactless payments sound)* incredibly insecure where you just swipe your card and the payment will go through. If somebody steals your wallet they can go into 50 shops at £30 a go and that's a £1,500 taken off your account'. UK consumers identify that device loss and the risk of fraudulent payment transactions has an adverse effect on perceived usefulness of mobile payments. This is consistent with previous research (Chari et al., 2000; Kristoffersen, Synstad & Sorli, 2008; VocaLink, 2015b; Wang, Streff & Raman, 2012) although payment guarantees mitigate risk concerns and can ensure that any financial loss resulting from fraudulent payment transactions is not born by the consumer (Polasik et al., 2012).

In order to overcome UK consumer resistance and to achieve wider mobile payment adoption, mobile payment organisations need to ensure that consumers understand that security controls apply to multiple contactless payments. In addition, ensuring that UK consumers are aware of and understand the payment guarantees provided (Gefen et al., 2003b; Laforet & Li, 2005; McKnight et al., 2002; Polasik et al., 2012).

The influence of perceived ease of use on perceived usefulness is supported by Hope who states that 'the ease of use of my Samsung S4 is fabulous and quite simple'. This

is in contrast to Hope's view of her previous phone when she says 'there is no support for Nokia Windows phone' before relating perceived ease of use with perceived usefulness by saying 'the type of mobile device will determine the mobile payment amount with contactless card for cash equivalent and mobile phone for larger value with its increased security and control'. This concept is consistent with the current upper limit of £30 that applies to the contactless card payments and competes with cash for these payment values (Eastwood, 2008; Ondrus & Pigneur, 2005). However, consumers choose the payment instrument based upon a number of characteristics including transaction value and self-serve or cashier serve at point of sale (Borzekowski, Kiser & Ahmed, 2008; Chong, Bagnall & Smith, 2011; Hayashi & Klee, 2003; Klee, 2005). Isla suggests that cash is a preferred payment mechanism in specific circumstances when she says 'I'd rather have the money in my pocket and I'd feel happier giving my children a £5 note to go to the shop rather than giving them my mobile device'. This concern at family members using the mobile payment device is supported by Edward who says 'mobile payments would not identify my son who is only 12 years old'.

Mobile payment is an additional payment method to existing and extensively used payment facilities including cash as well as chip and PIN for UK consumers (King, 2012). The adoption of a new payment method has to replace an existing payment method (Dahlberg & Oorni, 2006) although there are a number of payment exchange situations where mobile payments are unsuitable and existing payment instruments will continue to be used.

When considering ease of learning, 92% of questionnaire respondents agree that learning how to make a mobile payment will be easy with a mean average of 5.05, although learning to use an electronic payment instrument is not the same as actually using the payment instrument according to Fain and Roberts (1997). The questionnaire findings are generally consistent with the interview findings including Edward who says 'I struggle to see how they can make contactless card payments any easier to use'.

A variety of technology learning styles are identified including Hope who says that she 'learns through reading manual whilst using technology...and also learns by watching others and asking questions'. In addition, Isla says 'I would get somebody to show me

how to use it if I didn't know' whilst Charlie says 'I have experience across variety of platforms and technology is quite intuitive once you get your head around the way it works. I very rarely read a manual but play with it and use online help or Google it'. This is consistent with Diana who says 'technology is easy to use once I understand how to use them, but I find it hard to learn. I don't read the manual and I have to discover it myself so it is trial and error or being told by YouTube or someone instructing me'. A number of the learning approaches used are dependent upon communication technologies for accessing information and for interacting with others to meet these learning needs (Oblinger & Oblinger, 2005; Prensky, 2001; Tapscott, 1999).

Learning is critical to technology adoption (Agarwal & Prasad, 1999) whilst technological innovations usually involve substantial learning effort (Saaksjarv, 2003). UK consumers indicate a level of comfort with smart phones whilst the recent proliferation of consumer enabled technology devices (Thomson, 2012) may contribute to this ease of use perspective. Perceived ease of use is a dominant influence on perceived usefulness for mobile payments and internet banking (Al-Somali et al., 2009; Igbaria et al., 1997; Kim et al., 2010). However, even when a consumer has learnt how to make a contactless payment, continued adoption is not guaranteed as consumers may revert to using their familiar ways of paying (Sathye, 1999). This is consistent with Charlie who says 'I have used contactless card payments twice so far... but generally I put the card in a machine at point of sale and enter my PIN'. As a result, mobile payment organisations need to ensure that a positive consumer experience is obtained each time a consumer uses this new payment method in order to encourage continued adoption.

Furthermore, mobile wallets have to be installed and configured by consumers (Kreyer et al., 2003) with no training which has a negative impact on perceived usefulness and is an additional barrier to adoption. However, Beccie identifies that 'mobile wallet security will be better... (as) additional security features on the phone would give a benefit over other devices and address security issues' whilst Isla says 'I think you have to adapt and learn (new) technology now'.

In summary, UK consumers perceive mobile payments are easy to use and that learning how to make a mobile payment will also be very easy which is inconsistent with Chandra et al. (2010) for mobile payments with consumers in Singapore; Khalifa and Shen (2008) for m-commerce with consumers in Hong Kong; Eriksson et al. (2005) for internet banking with consumers in Estonia; and Peng et al. (2012) for tourism mobile payments with consumers in China. As a result, research proposition 3, which proposes that perceived ease of use has a positive effect on perceived usefulness of mobile payments for UK consumers, is not widely supported.

7.3.4 Research proposition 4. Perceived trust has a positive effect on the perceived usefulness of mobile payments for UK consumers.

When considering personal information, 23% of questionnaire respondents believe that their personal information is not safe and secure in varying degrees with a mean average of 4.13 whilst the interviewee responses show a much wider variation in the belief that personal information is safe. The varied interview responses on trust of personal information include Beccie who says that 'I need to be absolutely certain that the security is protected... the ability to pay with the device (*mobile phone*) is great but I am not sure about the security of my information... there is no bench mark for technology trust'. In addition, Julia says 'I am comfortable with perceived usefulness of mobile payments... touch and go is dead easy but I have concerns related to the security on my personal information'. This is consistent with Isla who says 'I have concerns in a mobile environment about data and security. It is a bit frightening and you do feel at times as though it is big brother watching you'. However, Graham identifies a personal information concern related to the organisation collecting the personal information when he says 'I am OK with that (*wireless environment and security*) as long as the organisation I am giving my details to is secure... I am not comfortable sometimes releasing my details to somebody I don't know'.

Confidentiality of data is by far the most important criteria according to Pousttchi (2003) and US consumers are most concerned about mobile payment companies collecting too much personal information (Dewan & Chen, 2005). This is consistent with Abrazhevich, Markopoulos and Rauterberg (2009) who suggest that personal

consumer information is only obtained when necessary and used sparingly. In addition, consumers should be made fully aware of what data is retained, what it is used for, and how the data will be managed so that trust is developed and maintained. However, this assumes that consumers actually read the information on consumer data management that is provided and understand what is documented and any implications (Milne & Culnan, 2004; Pan & Zinkhan, 2006).

UK consumers generally have a degree of trust in banks related to security of their personal information (Hanafizadeh et al., 2014) which is consistent with other research on security of personal information. Eriksson et al. (2005) identifies that Estonia consumers trust a bank to keep their personal data safe and secure; Gu et al. (2009) identify that WooriBank consumers trust in mobile banking services; Linck, Pousttchi and Wiedemann (2006) identify that German consumers trust perceived security of mobile payments; and Schierz et al. (2010) identify that German consumers trust mobile applications. However, these findings are inconsistent with Kandra and Brandt (2003) who identify that consumers have concerns related to the misuse of their personal data which is one of the biggest impediments for online retailers and online businesses.

When considering consumer trust, establishing initial consumer trust is critical to the successful adoption of mobile payments (Zhou, 2014) and trust is a key factor with Malaysian consumers according to Yan et al. (2009) whilst trust directly and indirectly affects a Chinese consumer's intention to use mobile payments (Lu et al., 2011) although not all consumers trust in the same manner. 77% of questionnaire respondents believe that their personal information is safe and secure in various forms although a number of interviewees indicate varying degrees of trust including Julia who says 'I am pretty trusting; if not over-trusting. I buy things online and it doesn't worry me'. In addition, Freddie says 'companies already have my payment information so I don't see any (*trust*) issues' whilst Edward says 'I have no concerns that my money is safe'.

A number of companies are involved in the complex mobile payments ecosystem (Information Technology and Innovative Foundation, 2009; Mobey Forum, 2011) which

can generate consumer trust through an association with the global brands of VISA and MasterCard. This is consistent with Beccie who says 'I trust the complex eco-payment structure already so only adding in a couple more stages then I wouldn't see that as a problem'. Hope states that 'there are multiple companies in the (*payment*) food chain and VISA and MasterCard engender trust'. In addition, Freddie identifies that consumer trust is created in a payment organisation when he says 'trust (*is created*) in an organisation that takes a payment with PIN security'. This is consistent with Graham who says 'I trust the scenario where it is chip and PIN with putting in your PIN code as being secure'. Beccie indicates trust in the mobile payment provider when she says 'risk is not an issue but I would rely upon the payment provider sorting out any issue'.

Various mobile payment programmes have been launched in a number of countries around the world (Beshouri et al., 2010; Karnouskos & Fokos, 2004; Lu et al., 2011; Ondrus & Pigneur, 2005) which engender consumer trust that positively influences perceived usefulness. This is consistent with Hope who says 'mobile payments are already in use in other regions around the world... (*which*) adds to trust'. In addition, Julia says 'the (*existing*) brand and company reputation would be used as determining factors' whilst existing reputation is a strong influence on initial consumer trust (Li, Hess & Valacich, 2008) and online trust may transfer to mobile trust through brand association (Zhou, 2014). However, Charlie identifies that trust in an existing organisation or brand may be misplaced but will only become apparent when an individual payment problems occurs when he says 'the level of trust in a global brand is higher whilst the substance behind it might not be what we perceive it to be'.

UK consumers generally trust that their personal information is safe and secure and trust positively influences perceived usefulness. This is consistent with Eriksson et al. (2005) who identify that consumers in Estonia trust a bank as a safe organisation but also trust a bank to keep their personal data safe and secure. However, trust does not influence perceived usefulness on mobile payments for consumers in Singapore (Chandra et al., 2010) although trust has a substantial influence on perceived usefulness of mobile banking services for consumers in South Korea (Lee et al., 2007).

When considering payment guarantees, consumers assess structural assurances provided by the mobile payment organisation that include technological and legal structures. These structural assurances support the establishment and maintenance of consumer trust (Zhou, 2014) whilst payment guarantees are the main influence of trust in mobile banking for consumers in Korea (Kim et al., 2009). However, any payment guarantee that is provided may not be clear or fully understood by the consumer which may include limited consumer protection that is not apparent until a claim is made (Sun & Sun, 2012). 89% of questionnaire respondents agree in various forms that a mobile payment guarantee generates trust with a mean average of 5.07.

The questionnaire findings on payment guarantee are predominantly consistent with the interview findings including Hope who indicates the benefit of a payment guarantee when she says 'my security concerns decrease with a payment guarantee'. In addition, Charlie says 'the substance (*of the guarantee*) might not be what we perceive it to be... with inaccurate consumer perception of indemnities. PayPal get benefit of the indemnity (*provided by the*) existing banking infrastructure but that (*payment guarantee*) doesn't actually exist with these (*PayPal*) payments'. This consumer perception of a payment guarantee is consistent with Au and Kauffman (2007) who identify that mobile payment services offered by non-financial institutions may not comply with the standard banking regulations that consumers have come to expect as a de facto standard. Furthermore, a number of interviewees indicate that payment guarantees should already exist including Isla who says 'I'd have expected this (*payment guarantee*) to have been provided anyway' before adding that 'a payment guarantee would provide peace of mind'. In addition, Diana says 'I wouldn't expect that you would have any other arrangement (*on payment guarantee*) as I would presume that this kind of thing was built in'. Alison indicates that 'they (*payment provider*) would have to provide a guarantee... I wouldn't do it (*make a mobile payment*) without a guarantee'.

Consumer awareness of a payment guarantee is fundamental although a number of interviewees indicate a lack of awareness of existing bank guarantees for contactless payments including Julia who says 'I am not aware of the bank's payment guarantee'. This is consistent with Charlie who says 'I am not aware of the bank guarantee on

contactless payments but the guarantee may have been hidden in the small print although I have used it (*contactless payment*) twice so far'. Mobile payment organisations need to ensure that UK consumers are fully aware and understand the consumer protection that exists within the legal and regulatory framework (Cheney, 2008). However, consumers rarely read and understand the guarantee information or the privacy policy provided (Milne & Culnan, 2004; Pan & Zinkhan, 2006).

Furthermore, payment guarantees can be used to acquire new consumers as indicated by Freddie who says 'if the bank offered a payment guarantee then I would go with that bank as it is a significant benefit in a decision to take a mobile payment facility'. Structural assurances positively and significantly affect trust in mobile payments (Xin et al., 2013) whilst 69% of German consumers indicate an interest in mobile payments if security and fraud protection are guaranteed (TSYS, 2015). However, Liden and Skalen (2003) suggest that guarantees act as a risk-reducing attribute rather than acting as a determinant of perceived usefulness which is consistent with Graham who says 'any payment guarantee would have no effect on the usefulness for me'. In addition, Julia says 'a payment guarantee would not increase trust in the (*payment*) organisation... but it would increase the trust in confidence in using it' before going on to say 'it (*payment guarantee*) makes you a bit more likely to use it'.

When considering device loss, the loss of a mobile payment device and the risk of fraudulent transactions is a concern identified by Swallow, Blythe and Wright (2005) and Shin (2009). This is consistent with Hope who says 'I have fraud concerns with the loss of the payment device' whilst Julia refers to this as 'the security... and (*the implications*) if you lost it'. In addition, Beccie identifies that 'a payment guarantee would add to the security view' although payment guarantees mitigate consumer concerns (Polasik et al., 2012). However, consumers do not trust mobile phones as a payment instrument due to the potential loss or theft of handset including the personal consumer data the device may hold (Kristoffersen et al., 2008). This is consistent with Alison who identifies that portable consumer devices have an increased risk of loss when she says 'it would make me very doubtful about something small that you could lose and I would rather have my computer in my little study'. Alison's perspective is consistent with To and Lai (2014) who identify that consumers believe that using a

computer is safer than using mobile phones. Consumers are already familiar with online payment systems and computers have sophisticated anti-virus and internet security that is generally lacking on mobile phones.

UK consumers lack previous experience with mobile payments which have increased risks that includes device loss as mobile phones are small portable devices (Shin, 2009). The establishment of initial trust is critical to mitigating perceived risks (Zhou, 2014) whilst payment guarantees mitigate device loss risk (Eriksson et al., 2005).

In summary, confidentiality of data is an important criteria for mobile payments (Pousttchi, 2003) and the majority of UK consumers have an increased level of trust in banking organisations with their personal information which is consistent with Eriksson et al. (2005) and Hanafizadeh et al. (2014). However, UK consumers indicate a comparable level of trust in other payment companies such as Google or PayPal which is inconsistent with Bizrate Insights (2014) who identify that consumers trust banks to protect their card details and personal financial information far more than they do companies like Google, Apple and Amazon.

A majority of UK consumers also trust complex payment structures, particularly those with a VISA or MasterCard brand association (Waris et al., 2006). A broad range of positive UK consumer perspectives of trust are identified with existing brands whilst there is a lack of trust towards unknown organisations or new market entrants which is consistent with Li et al. (2008). UK consumers have a preference for mobile payments provided by a bank compared to a MNO or other payment organisation despite the numerous payment risks related to mobile payments provided by organisations other than banks (Chande, 2008). In addition, UK consumer trust in mobile payments increases when payment guarantees are provided which is consistent with Zhou (2014) although there is a lack of consumer awareness of the existing payment guarantees (Clarke, 2008; Pan & Zinkhan, 2006). Furthermore, UK consumers identify that a payment guarantee provided by a non-banking organisation may not be as strong as consumers expect which is consistent with Au and Kauffman (2007).

PIN authenticated payments have established a large degree of trust. As a result, a large number of UK consumers indicate security concerns with contactless payments

with no PIN authentication despite the consumer trust in complex payment structures with a VISA or MasterCard brand association (Waris et al., 2006). Furthermore, UK consumers also indicate concerns with portable device loss or theft and subsequent fraudulent transactions which is consistent with Shin (2009) and Swallow et al. (2005). As a result, consumers perceive that making a mobile payment has technology and security risks (To & Lai, 2014; Zhou, 2014) which have a negative effect on perceived usefulness of mobile payments (Swallow et al., 2005).

Payment guarantees increase trust and offset perceptions of risk (TSYS, 2015; Zhou, 2014) although consumer awareness of payment guarantees is a pre-requisite (Clarke, 2008; Pan & Zinkhan, 2006). However, UK consumers indicate a lack of awareness of payment guarantees that UK banks provide (Barclaycard, 2015a; HSBC, 2015; Royal Bank of Scotland, 2015) which negatively influences perceived usefulness. As a result, research proposition 4, which proposes that perceived trust has a positive effect on the perceived usefulness of mobile payments for UK consumers, is generally supported.

7.3.5 Research proposition 5. Perceived trust of a bank by UK consumers will be higher than perceived trust of other mobile payment providers due to reduced perceived risk.

When considering bank trust, Lexis (2011) identifies that 48% of UK consumers indicate a preference for a traditional bank to operate their mobile wallet whilst 87% of questionnaire respondents trust a UK bank for mobile payments in varying degrees with a mean average of 4.68. In addition, 73% of German consumers have a preference for a smartphone App from a bank to make a mobile payment (TSYS, 2015). The questionnaire findings are generally consistent with the interview findings where 50% of interviewees expressed a positive perspective for a UK bank including Edward who says 'my trust in established (*UK*) financial institutions is quite high following my previous experience... although I would have a different (*detrimental*) attitude to a small foreign bank though'. This is consistent with VocaLink (2015c) who also identify that 50% of UK consumers are more likely to use a new mobile payment method if it comes from a bank. Furthermore, Edward indicates confidence in the bank resolving any payment issues when he says 'I will get the cash back (*in the event of an issue*)

based upon the trust of well-established banking organisations'. This is consistent with several other interviewees including Julia who says 'it is in the company's (*bank's*) interest to resolve and make sure it doesn't go wrong and a bank will sort it if there's a problem... a more traditional bank would be more supportive'. In addition, Alison says 'If a UK bank makes a mistake you will get it refunded by the bank' and Charlie says 'I trust Barclays Bank as you have to go through several levels of security to get into your account and you need several physical devices and codes'.

A number of other interviewees expressed their trust in UK banks in different ways including Hope who says '(I) trust established companies for mobile payments... but VISA and MasterCard (*brands also*) engender trust'. In addition, Edward says 'I stick with what I know as it works. It's secure, it's safe... and my level of trust in a global brand is higher'. This is consistent with Beccie who says 'there is a significant effect of trust with well-known brands in the UK'. Consumer trust in mobile payments provided by an established and trusted brand of a bank or credit card company, including VISA and MasterCard, can positively influence interest and adoption (VocaLink, 2015b; Waris et al., 2006).

A number of UK consumers trust large established payment organisations based upon existing reputation and brand image although the legal and regulatory safeguards related to controls and security of payments are weak (Clarke, 2006). Consumer trust is also generated from PIN authenticated payments as identified by Freddie when he says 'I trust the organisation taking a payment with PIN security'. However, payment acceptance is a complex environment involving multiple organisations (Rochet & Tirole, 2002). In addition, a number of interviewees indicate a level of trust in consumer protection controls for payments as expressed by Isla who says 'I don't think I'd have any concerns over the payment provider as I'd imagine that in order for them to provide the facility they'd have to be checked and told they're secure'. This is consistent with Diana who says 'I wouldn't expect you would have any other arrangement as I would presume that that kind of thing was built in'.

Organisational reputation is a key factor that affects initial trust (Li et al., 2008) and Chandra et al. (2010) identify that the reputation of the mobile payment organisation

is important for consumers in Singapore. This is consistent with Beccie who says 'there is a significant effect of trust with well-known brands in the UK... as long as nothing hugely negative being written this helps build a reputation'. Furthermore, Jan and Abdullah (2014) identify that trust is a mediating variable when technology is used in the support of service provision and Jarvinen (2014) identifies consumers generally trust UK banks independent of age or educational qualifications.

UK consumer trust of a bank over other payment providers is consistent with other research including Abrashevich (2001) who identifies that 97.6% of respondents would trust a payment system provided by an established organization; Arvidsson (2014) who identifies that trust in banks has a positive effect on the consumer intention to adopt mobile payments; Dahlberg et al. (2003) who identify that consumers in Finland trust banks as providers for mobile payments first over other organisations; and Hanafizadeh et al. (2014) who identify trust in banks compared to MNOs. In addition, Mallat (2007) identifies that consumers in Finland would undertake mobile payments with reliable trustworthy parties with a slight preference for banks whilst Eriksson et al. (2005) identifies that consumers in Estonia trust a bank as a safe organisation. Furthermore, Phoenix Marketing International (2014) identify that more than 66% of US consumers would take a wallet from a bank rather than from PayPal or Apple.

When considering MNO trust, Mallat (2007) identifies that consumers in Finland believe that MNOs are reliable trustworthy parties for mobile payments with slightly lower trust than established banks. In addition, Kim et al. (2009) identify that Korean consumers have a similar trust for banks and MNOs whereas 87% of questionnaire respondents trust a UK bank but only 65% trust a MNO. This is also reflected in the mean average of 4.68 for trust in a UK bank but only 3.90 for trust in a MNO. The questionnaire findings are generally consistent with the interview findings including Julia who says 'the least trust would be the T-Mobile type (*MNO*) but I wouldn't be too worried (*about any payment organisation*)'. In addition, Edward shows a lack of MNO trust in the payments market when he says 'I wouldn't choose to use new entrants so it wouldn't affect me even if market flooded with them... I stick with what I know as it works. It's secure, it's safe'. This consumer concern for new market entrants is consistent with Alison who says 'I do think the new players have a lot to learn yet' and

shows UK consumers have a lack of trust for new mobile payment organisations, including MNOs who enter the payments market. Whilst existing trust in a company minimises the consumer risk perception of that company (Zhu, Lee, O'Neal & Chen, 2011), current customer MNO trust does not appear to transfer to the provision of mobile payments through a MNO.

UK consumers have a negative perspective of new organisations entering the UK mobile payments market which includes MNOs, although trust is not a large discriminator for Taiwan consumers with contactless card payments (Wang & Lin, 2008).

When considering other provider trust Kapferer (2012) suggests that brand is used by consumers to assess risk and to establish trust whilst trust in existing payment services is a strong positive influence on initial trust in mobile payments for Chinese consumers (Lu et al., 2011). 78% of questionnaire respondents indicate trust in another payment company such as Google or PayPal with a mean average of 4.19 and the questionnaire findings are also generally consistent with the interview findings. Diana says 'I would trust Google and PayPal as much as I would trust Lloyds Bank. You can't really judge which is safer... as you have no knowledge as a consumer to compare security' although this is a subjective assessment according to Chellappa and Pavlou (2002). In addition, Diana's trust perspective is consistent with Hope who says '*(I would)* trust established companies for mobile payments'. Edward says 'the level of trust in a global brand is higher' which is consistent with Julia who says 'I trust big organisations... the brand and company reputation would be used as determining factors'.

Numerous payment risks related to non-banking organisations are identified by Chande (2008) but it is not clear if these risks are fully understood by UK consumers. This is consistent with Diana who says 'you have no knowledge as a consumer to compare security'. Any risk assessment of mobile payments requires a clear understanding of the laws, policies and practices that apply with few consumers aware of the safeguard details according to Clarke (2008). Furthermore, consumer perception of trust in large established organisations may be misplaced as identified by Edward who says 'the underlying perception of trust in large established organisations with

global brands can be vapourware... with inaccurate perceptions of indemnities... (*as an indemnity*) doesn't actually exist with these payment organisations'. In addition, Freddie identifies a lack of trust with an established non-banking organisation when he says 'I had a PayPal issue that didn't fall into Section 75 of the Consumer Credit Act but I only found out when the issue arose'. This is consistent with Alison who says 'PayPal have not got strict controls and is open to abuse... (*whilst Google and PayPal*) are huge (*companies*) they are not helpful at all, whereas established banks have been going for a very long time and their morals are totally different'.

A lack of payment indemnity may only be identified when a payment issue occurs as consumers rely upon the perception of resolution support expected from a global company (Sun & Sun, 2012). This is consistent with Julia who says 'I do internet banking, PayPal, buy things online and it doesn't worry me... but I've never had a bad experience'. In addition, Isla says 'I am used to using PayPal... I don't think I'd have any concerns over the payment provider as I'd imagine that they'd have to be checked and told they're secure'. Diana says 'I have to use PayPal because I use EBay but I only use these payment companies because I am forced to do so. I adopt these because I have no other choice'.

In summary, UK consumers have a preference for mobile payments provided by an established UK bank compared to a MNO or other payment organisation although UK consumers indicate a comparable level of trust in other established global companies such as Google or PayPal. As a result, research proposition 5, which proposes that Perceived trust of a bank by UK consumers will be higher than perceived trust of other mobile payment providers due to reduced risk, is generally supported.

7.3.6 Research proposition 6. Perceived risk has a negative effect on the perceived usefulness of mobile payments for UK consumers.

Risk is a key negative influence for mobile payments in Sweden (Arvidsson, 2014); mobile banking in Germany (Koenig-Lewis et al., 2010); online banking in Taiwan (Lee, 2009) and online banking in Spain (Aldas-Manzano et al., 2010). In addition, van der Heijden (2002) identifies that perceived risk is more important in the early life-cycle of a new phenomenon for Swedish and Dutch consumers.

87% of questionnaire respondents indicate that mobile phone payments have risks in varying degrees with a mean average of 4.47 whilst 82% of questionnaire respondents believe that contactless card payments also have risks in some form with a mean average of 4.43. These findings are generally consistent with the interview findings although Isla puts perceived risk into perspective when she says 'I don't know enough about it (*risk*) to know what I should be worried about to be honest'.

When considering mobile phones Kristoffersen et al. (2008) identify that consumers do not trust mobile phones as a payment instrument whilst consumers in Finland identify concerns for unauthorised use of a mobile phone to make mobile payments (Mallat, 2007) and UK consumers do not believe it is secure or safe (Lloyds Bank, 2015). In addition, consumers have concerns on phone theft and data loss (Chin et al., 2012) which is consistent with a number of interviewees who express concerns over a lost or stolen mobile phone that can then be used to undertake fraudulent payment transactions. Hope who says 'I have fraud concerns with the loss of the (*smart phone*) device' and Julia says 'risk relates to leaving the mobile phone and someone picks it up and start to use it (*for mobile payments*)'. Furthermore, Hope also expresses concern at being targeted by thieves when she says 'with the phone on view it may lead to my (*smart*) phone being targeted by robbers and stolen'. This is consistent with Julia who says '(*smart phone*) devices could become very attractive to thieves... and being out and about increases the risk slightly' (Shin, 2009; Swallow et al., 2005). However, the lost or stolen smart phone is put into a perspective by Freddie who says 'it is easier to steal a phone which is valuable compared to other mobile payment device types. However, if you get mugged your wallet would get stolen along with your mobile phone and watch if it is valuable, so risk by device type is irrelevant'.

In addition, Beccie suggests that 'risk is based upon the type of device with access to more data on phone... (*as*) the more complex the device the more complex personal data and the higher risk associated with it'. This is consistent with Hu, Li and Hu (2008) who identify devices like smart phones create a higher risk of theft due to the increased value of the device along with any personal information that is held on the device. However, sophisticated technology including smart phones can be made secure although this security option may fail if it is not easy for consumers to establish (Kreyer

et al., 2003). Furthermore, Hope suggests that consumers may manage transaction value risk through different technology devices when she says 'the type of mobile payment device will determine mobile payment amount'. This is supported by Boeschoten (1998) who identifies that the transaction value is one of the predominant consumer variables when deciding which particular payment instrument to use.

Consumer security of mobile payments is also associated with technological risk with the potential loss of personal information and financial loss through malware, a virus, Trojan horse infections and other attacks (To & Lai, 2014; Zhou, 2014). In addition, mobile networks are also vulnerable to hacker attacks and information interception (Zhou, 2014). Technology risk is identified by Alison when she says 'If they can hack into computers very easily they can hack into mobile phones very easily too'. However, Chaix and Torre (2012) suggest that information stored in mobile phones can be very secure. In addition, consumers who use online payments perceive computers are safer than mobile phones due to increased safety of computers with anti-virus and Internet security systems but also computers are not portable consumer hand-held technology devices (To & Lai, 2014). This is consistent with Alison who says 'everything to do with my bank details is in the house and I have the PC secure at home... it's a dangerous risk with (*smart*) phones'.

When considering contactless payments, a card payment with PIN authentication is widely adopted in the UK (Ward, 2006) and, as a result, the consumer benefits of adopting a new electronic payment method are not clear (Englund & Turesson, 2012). 82% of questionnaire respondents indicate that contactless card payments have risks although perceived risk is not a key discriminator for Taiwan consumers and contactless cards (Wang & Lin, 2008). The questionnaire findings are generally consistent with the interview findings including Julia who says 'PIN offers a degree of security whereas if your card is stolen they (*fraudsters*) could make several purchases on tap and go... which is a slight concern'. In addition, Graham says 'it is incredibly insecure where you just swipe your card and the payment will go through... if someone stole your card then they could just swipe. I would never subscribe to that then *as* I'd never trust it'. Freddie says 'it would be easy to steal money *using* the (*contactless*) card but most of the time I can't really see that being an issue'. Isla says 'it (*contactless*)

just makes me feel nervous and if you found somebody's card you could just do it... It feels less secure and doesn't appeal'. Alison says 'you don't have to enter your PIN or sign anything... without a PIN there has to be a risk'. Furthermore, PIN authentication is always used by Edward who says 'I never use the contactless facility as I always enter my PIN to validate payment even though I am aware of touch and go; but security of PIN entry provides a level of security... as it is only a few seconds for PIN entry and I am not that in that much of a rush and I stick with what I know'. This is consistent with La Caixa (2012) who indicate that consumers in Spain continued making conventional payments after they had received their contactless card. In addition, Javelin Strategy and Research (2006) identify that 61% of respondents in the USA are unlikely to adopt contactless payments due to security concerns although payment guarantees mitigate risks (Eriksson et al., 2005; Polasik et al., 2012). Mobile payment organisations need to fully address UK consumer concerns related to fraudulent transactions on contactless payments with no PIN authentication in order to overcome consumer resistance.

When considering data risk, personal and sensitive information is stored on complex technology devices like smart phones which can be easily lost or stolen and all this information can then be accessed and used by a fraudster (Shin, 2010). The loss of the smart phone and the data risk is a concern for consumers under the age of 30 (Hong, Teh & Soh, 2014) which has a negative influence on perceived usefulness and creates a barrier to adoption (Shin, 2009; Swallow et al., 2005).

Data risk is identified by a number of interviewees including Beccie when she says 'we need to be careful... as risk is based upon the type of device with more personal data on a smart phone... the more complex the device the more personal data and the higher risk associated with it'. Julia says 'the security of all your information on the smart phone... and the implications if you lost it (*smart phone*)... the ability to pay easily... You are setting yourself up for big security issue with it (*personal data*) all in one place'. In addition, Charlie says 'I have some concerns about the security risk with smart phones' and Hope says 'I have fraud concerns with the loss of the payment device'. However, Alison says 'the more portable electronic systems are used the more you leave yourself open to the risk of loss of personal information... it would make me very doubtful about something small that you could lose and I would rather have my

computer in my little study'. This is consistent with To and Lai (2014) who identify that consumers believe that using a computer has less risk than using mobile phones as portable devices are easier to lose or to have stolen.

The expanding use of consumer based complex technology devices for mobile financial services increases data security risks (Cheney, 2008) with increased opportunities for identity theft as well as losing financial assets (Hu et al., 2008). However, Beccie suggests that risk can be reduced when she says 'mobile wallet security will be better... (as) additional security features on the (*smart*) phone would give a benefit over other devices and address security issues'. Consumers are unable to physically assess security of mobile wallets and as a result, it is consumer perception of mobile wallet security that determines the risk (Amoroso & Magnier-Watanabe, 2012; Linck et al., 2006).

In addition, Graham identifies a wireless technology risk when he says 'there may be 14 people sitting outside with laptops (*capturing this information to use fraudulently*)'. This is consistent with Charlie who says 'I'd be concerned at someone coming up with some kind of hacking device or other unit like a security device at an airport that you pass through... where the device information could be picked up and results in cloned payment devices'. Wireless technology risk negatively affects perceived usefulness and is a further obstacle to adoption. Mobile payment organisations need to fully address UK consumer concerns related to data risks including device loss, identity theft, fraudulent transactions and device cloning in order to overcome consumer resistance.

Mobile payment is a new phenomenon for UK consumers with increased perceived risks (Zhou, 2014). PIN authenticated payments have a large degree of consumer trust in the UK whilst making a contactless or mobile payment without PIN authentication is a risk that UK consumers identify despite the trust in complex payment structures with a VISA or MasterCard brand association (Waris et al., 2006). In addition, UK consumers also identify risks with portable device loss or theft (Shin, 2009; Swallow et al., 2005) and the subsequent potential fraud transactions that negatively influence behavioural intention. As a result, UK consumers perceive that making a mobile payment has technology and security risks (To & Lai, 2014; Zhou, 2014). Risks have a negative effect

on perceived usefulness of mobile payments (Swallow et al., 2005) and mobile banking (Mortimer et al., 2015).

UK consumers believe that contactless cards are very easy to use but this has no effect on behavioural intention to use this payment instrument as the perceived risks outweigh the advantages (Wang & Lin, 2008). Whilst payment guarantees can increase trust and offset perceptions of risk (Zhou, 2014) this is dependent upon consumers being aware of any payment guarantees (Clarke, 2008; Pan & Zinkhan, 2006). However, UK consumers indicate a lack of awareness of existing guarantees provided by UK banks (Barclaycard, 2015; HSBC, 2015; Royal Bank of Scotland, 2015). As a result, research proposition 6, which proposes that risk has a negative effect on perceived usefulness of mobile payments for UK consumers, is generally supported.

7.3.7 Research proposition 7. Perceived ease of use has a positive effect on UK consumer attitude to mobile payments.

When considering mobile payment registration Khodawandi et al. (2003) and Pousttchi (2003) identify registration is not a large concern for consumers. However, this is inconsistent with 62% of questionnaire respondents as registration adversely affects a consumer's interest in the mobile payment through a negative influence on perceived ease of use which is consistent with Mallat (2007). The questionnaire findings are generally consistent with the interview findings including Julia who says 'mobile payment registration would probably put me off as it is another thing to do and I would need encouragement to use it'. In addition, Alison says 'I don't think I'd be terribly happy to complete a registration process'.

However, a number of interviewees acknowledge that registration is a one-off activity including Beccie when she says 'registration is only done once but the convenience (*of mobile payment*) is dependent upon the price of item being purchased'. Isla says 'if you are going to use something regularly then going through the registration rigmarole and a one-off setup is fine but... I can't stand having to go through a complex rigmarole... the whole registration process does detract a little bit'. However, Charlie suggests that a simple registration process is not detrimental when he says 'I wouldn't be bothered... as a simple registration... is fine'. A registration process has a negative influence on

perceived ease of use for consumers (Dahlberg et al., 2003) whilst Viehland and Leong (2007) identify that an onerous registration process has a detrimental impact on consumer interest in mobile payments in New Zealand.

Furthermore, Diana identifies an additional registration perspective related to the actual mobile payment organisation when she says 'registration would depend upon who you are registering with as to whether it has an impact on interest'. Reputation and brand of the payment organisation can influence the consumer perceptions of ease of use and subsequent behaviour (Sun & Sun, 2012). Registration for mobile payments has a negative impact on UK consumer interest and perceived ease of use, although a simple electronic registration process can minimise any negative impact (Ondrus & Pigneur, 2005).

When considering smart phone devices consumers do not use all the services available on the mobile phone (Verkasalo et al., 2010) and smart phones are predominantly used for core functionality (Matthews, Pierce & Tang, 2009; Osman et al., 2012). This is consistent with the questionnaire findings where 94% of respondents use their mobile phone for phone calls; 96% use the mobile phone for text messages; 79% use the photograph function; 73% use the email function and 70% undertake web browsing on their smart phone. Furthermore, 94% of questionnaire respondents indicate that mobile phone technology is easy to use whilst 90% indicate that a smart phone is easy to use. However this is inconsistent with Kleijnen et al. (2004) who identify that mobile payments with complex devices can result in negative ease of use perceptions as a result of cumbersome navigation options including personal settings which is in contrast to Hope who says 'my Samsung S4 mobile phone is fabulous and quite simple'.

A number of interviewees express concerns of making a mobile payment with a smart phone including Alison says 'I have a concern at using my phone for mobile payments... the same (*payment*) functionality on a mobile phone would be as easy but I would want to enter a PIN'. In addition, Julia expresses security concerns when she says 'there is not much difference between my security concerns for card and phone (*payments*)'. This is inconsistent with Li, Liu and Heikkila (2014) who find that perceived ease of use positively affects consumer attitude to mobile payments in China. However, Freddie

indicates that ease of use has a positive effect on mobile payments when he says 'ease of use is simple... (*and*) mobile payment would be useful'. This is consistent with Beccie who says 'perceived ease of use will be very easy... and I have no concern at using the mobile phone for making a payment'.

When considering contactless payments various devices can be used to make contactless payments including EMV smart cards and smart phones (ApplePay, 2015a; SamsungPay, 2015b) and 75% of the questionnaire respondents indicate that a smart phone is easy to use. This is inconsistent with Chang et al. (2009) who suggest that mobile phone applications and services are too complex. The questionnaire findings are generally consistent with the interview findings including Edward who says 'I struggle to see how they can make contactless (*payments*) any easier'. In addition, Julia says 'touch and go is dead easy' whilst both Alison and Diana indicate that 'mobile payments would be easy'. However, Alison goes on to identify device loss and potential fraud risks outweigh any advantages of contactless payments when she says 'card risks outweigh the usefulness'.

Perceived ease of use generally has no effect on the affective response of behavioural intention for UK consumers which is consistent with a number of previous studies including Chandra et al. (2010) for mobile payments with consumers in Singapore; Chong et al. (2012) for mobile commerce with consumers in Taiwan and China; and Curran and Meuter (2005) for online banking with consumers in North East USA. In addition, this is also consistent with Khalifa and Shen (2008) for m-commerce with consumers in Hong Kong; Wang and Lin (2008) for contactless cards with consumers in Taiwan; and Wu and Wang (2005) for mobile commerce with consumers in Taiwan. However, Polasik et al. (2012) identify that perceived ease of use has a positive effect on the behavioural intention of consumers in Poland to use contactless cards and a positive effect on behavioural intention for mobile payment consumers in Germany (Pousttchi & Wiedemann, 2007; Schierz et al., 2010). This research identifies that perceived ease of use has a very limited effect on behavioural intention for contactless payments for UK consumers. The lack of influence of perceived ease of use on attitude is consistent with other research including internet banking (Rawadesh, 2015; Sikdar et al., 2015; Yadav et al., 2015); mobile banking (Mortimer et al., 2015); and self-service

technology (Kavshik & Rahamn, 2015). These research findings may reflect different consumer behaviour patterns with electronic payments in different societies as well as variances that arise from the different cultural beliefs, values and social aspirations (Yang et al., 2012).

When considering Apps and adoption, consumers can install and use Apps on a smart phone that meet their individual needs although not all smart phone services are used by consumers (Verkasalo et al., 2010). Choudrie et al. (2014) identify 10 'must have' smart phone Apps which are making a phone call, taking a photograph, text messaging, emailing, browsing a website, using social networks, downloading Apps, mapping and navigation, playing games and public transport management. An average of 9.75 smart phone Apps are used by the questionnaire respondents with a predominant focus on the core functionality that include phone calls, text messages, music, calendar, pictures, videos, GPS and games (Matthews et al., 2009; Osman et al., 2011; Osman et al., 2012). However, there is a disparate range of interviewee responses on smart phone App usage including Julia who says 'I have an old mobile phone but I only use it for phone calls'. In addition, Hope says she 'is a medium user of Apps plus text, phone, camera, email and web browsing'. Beccie says 'I use about 40% to 50% of the Apps (*on the iPhone*)... although I am quite selective of the Apps I use' and Isla who says 'I use the phone for text, phone, browsing the internet, Facebook and photographs as the main thing.

Smart phone Apps play a critical role in the consumer experience (Chin et al., 2012) whilst the questionnaire findings identify that the largest users of smart phone Apps are respondents aged less than 55 years old. The average number of Apps used by all questionnaire respondents is 9.75 although respondents aged 55 to 64 years old use an average of 7.62 Apps whilst those aged 65 years and older use an average of 3.93 Apps. This is consistent with other research including Choudrie et al. (2014) who identify that UK consumers in the older age groups are slower to adopt smart phones whilst those older consumers who have adopted smart phones generally use the top five functions and with less downloading of Apps and social networks. In addition, van Biljon and Kotze (2008) identify that age influences mobile phone usage whilst Zhou, Rau and Salvendy (2014) identify that adoption of a smart phone by older Chinese

consumers does not lead to adoption of new functions or Apps on their smart phones. Furthermore, there is also an App usage bias by gender for those 20 respondents aged 55 to 64 years old as the 11 male respondents use an average of 9.18 Apps whilst the 9 females use an average of 5.6 Apps. This is consistent with Rouibah (2009) who identifies that perceived usefulness is a strong influence for male adoption of technology whilst female adoption is based upon a woman's perception of the technology's ease of use.

Consumer adoption of mobile wallets begins with consumer awareness (Rogers & Shoemaker, 1971) whereas 57% of questionnaire respondents have not heard of mobile wallets and no mobile wallets have been downloaded by any interviewees which is consistent with Bamasak (2011). However, consumers who have heard of mobile wallets may still not understand the benefits that a mobile wallet can provide, or how easy the mobile wallet is to install, configure and use (Swilley, 2010). The lack of benefits identification influences consumer attitude and is one of the reasons for a lack of adoption (van Biljon & Kotze, 2008). The consumer lack of knowledge of Apps is consistent with Graham who says 'It would never occur to me to download an App. I don't know what the benefit would be over internet access'. The influence of perceived ease of use on consumer attitude is demonstrated by Graham with the Sat Nav App when he says 'my mobile phone has say 50 Apps including Sat Nav equivalent which I have used twice but it didn't work very well... so I don't use it any more'.

In summary, perceived ease of use affects a consumer's attitude to mobile services according to Phan and Daim (2011) and perceived ease of use exerts a substantial influence on South Korean consumer intention to use mobile payments (Kim et al., 2010). UK consumer attitude to mobile payments is detrimentally affected by a registration process which is consistent with Mallat (2007) although a simple electronic registration process can minimise negative impact (Ondrus & Pigneur, 2005). In addition, a large number of UK consumers indicate that a smart phone is easy to use although it is predominantly used for core functionality (Matthews et al., 2009; Osman et al., 2012). Furthermore, UK consumers do not use all the Apps that are available on the smart phone which is consistent with Verkasalo et al. (2010). The predominant usage of Apps is for the core smart phone functionality (Choudrie et al., 2014) although

less Apps are used by those aged 55 years old and above with less Apps used by females and is consistent with van Biljon and Kotze (2008). In addition, contactless payments are perceived to be very easy to use although this has no effect on behavioural intention for UK consumers as the perceived risks outweigh the advantages which is consistent with Wang and Lin (2008).

As a result, research proposition 7, which proposes that ease of use has a positive effect on UK consumer attitude to mobile payments, is not widely supported.

7.3.8 Research proposition 8. Perceived usefulness has a positive effect on UK consumer attitude to mobile payments.

When considering faster payments, Ching and Hayashi (2010) identify that speed of payment is a substantial influence on perceived usefulness. Cash is the dominant payment method in Australia when average payment values are low and where quick payment times are preferred (Chong et al., 2011). However, 74.3% of USA consumers believe that mobile payments will improve the speed of the payment transaction compared to a signature authentication (Dewan & Chen, 2005; Polasik et al., 2010). 84% of the questionnaire respondents agree in varying degrees that mobile payments would be of interest if it provides a faster payment option than existing payments with a mean average of 4.63. However, only Freddie from the interviewees identified the usefulness of faster payments when he says 'mobile payments would be useful as time is of the essence in payments at point of sale although the time saving will be minimal'.

UK consumers have widely adopted PIN authenticated payment transactions (King, 2012; Ward, 2006) which only adds a couple of seconds to the payment process. This is consistent with Edward who says '*it takes* a few seconds for PIN entry and generally I am not in that much of a rush'. This perspective is supported by Diana who says 'I do not see any advantage of waiving a card in front of a machine over putting it in and typing in a number which would take all of 15 seconds more and everywhere seems to have that (*card and PIN acceptance*)'. In addition, Isla says 'chip and PIN is not exactly time-consuming' and then indicates that 'mobile payment is a step too far at the moment for me' whilst Julia says 'I am happy to carry on with the way I always have with my card and entering my PIN'.

Borzekowski and Kiser (2008) and Polasik et al. (2013) suggest that making a contactless payment is the quickest payment option at point of sale. However, Shin (2009) suggests that a mobile wallet offers faster processing although this is inconsistent with Luinenburg (2014) who identifies that most consumers believe that it is faster to use their EMV smart card than to launch an App on their smart phone to make a payment. However, the mobile wallet provided by SamsungPay (2015b) avoids a number of these consumer resistance points whilst also providing fingerprint or PIN authentication. Moreover, the time that a consumer saves through mobile payment adoption compared to use of a card with PIN authentication is not that substantial. As a result, the slightly faster payment time is not an influence on UK consumer attitudes for mobile payments.

When considering queue avoidance Mallat (2007) suggests that consumer interest in mobile payments can arise when a number of situational factors are addressed including the presence of queues. Barclays Bank (2010) identify that 40% of consumers refuse to queue for longer than two minutes and 68% regularly abandon purchases. In addition, younger shoppers aged 18 to 24 years old will wait a full two minutes longer in a queue than those aged 55 to 64 years old. Mobile payment interest for queue avoidance is supported by 95% of questionnaire respondents who agree in varying degrees that mobile payments are useful to avoid queues.

The questionnaire findings are consistent with MasterCard (2012b) who identify that consumers in 7 major cities in USA would use mobile payments to avoid queues at ticketing machines as queue avoidance influences perceived usefulness which then has a positive effect on consumer attitude (Kim et al., 2010; Schierz et al., 2010). UK consumer interest in queue avoidance has been identified in ASDA supermarkets and Marks & Spencer stores (ASDA, 2012; Mallat, 2007; Marks & Spencer, 2013). Furthermore, Edward identifies that mobile payments will be useful in a high volume cash based transport environment when he says 'a Mersey tunnel payment with the flash of a card or phone at one booth (*is useful and*) I'd automatically go there as I don't carry cash'. In addition, Diana says 'making a mobile payment... in the London Underground situation with lots of people trying to do the same thing at the same time then that 15 seconds counts... so I see the purpose and see the advantage; so yes I'd

use it'. The perceived usefulness of mobile payments in a high volume transport situation is consistent with UK Cards Association (2015b); Hayashi (2012) and Chicago Transit (2014) who plan to accept mobile payments for transport journeys in 2016.

However, mobile payment adoption is dependent upon specific benefits being identified by consumers which form the starting position from which consumer interest influences attitude that subsequently transforms into widespread adoption. Acceptance of mobile payments in mass transportation has led to widespread adoption by consumers in Japan (Bielski, 2007). Additional consumer benefits are identified where mobile payment acceptance occurs in high volume venues over a very short period of time (Chen, 2008). However, UK consumers identify a number of security concerns including mobile payments with no PIN authentication that will need to be overcome in order to achieve wider adoption.

When considering the upper limit of a mobile payment, Mallat (2007) suggests that values of €10 to €100 with a mobile phone handset are acceptable to consumers in Finland. However, the questionnaire respondents identify a wide range of mobile payment upper limit values with 22 respondents indicating an upper limit of £100; 20 respondents indicating an upper limit of £50; whilst 12 respondents indicate an upper limit of £999 or £1,000 although an upper limit of £12 or less is indicated by 9 respondents. The mean average upper limit value for all questionnaire respondents is £208.22 although this reduces to £92.86 when the 3 respondents who indicate a transaction value of £0 and £5 and excluded along with the 12 respondents who indicate an upper transaction value of £999 and £1,000. These research findings suggest that male UK consumers with a higher level of education have an increased interest in mobile payments for higher values.

The wide range of upper mobile payment limits identified from the questionnaire responses is consistent with the varied interviews findings. Diana suggests that each consumer should determine their own upper mobile limit when she says 'the flexibility to amend the limit to suit my own requirements would be of interest'. In addition, Hope suggests that the mobile payment limit may be determined by the device type the consumer uses for mobile payments when she says 'the type of mobile payment device

will determine mobile payment amount with contactless card for cash equivalent and (*smart*) phone for larger value (*payments*) with increased security and control (*of the device*). This is consistent with Beccie who says 'mobile payment limits could vary according to device type... with a lower limit set by the consumer for higher risk payments'. Previous research has identified that transaction value and other transaction characteristics have a strong impact on the payment instrument used by consumers (Boeschoten, 1998; Bounie & Francois, 2006; Hayashi & Klee, 2003).

A number of interviewees identify that mobile payments are perceived as useful including Beccie who says '(*mobile payments*) are of interest' whilst Julia says 'I am comfortable with the perceived usefulness of mobile payments'. This is consistent with Freddie who says 'mobile payment would be useful' and Alison who indicates that a 'mobile payment would possibly be useful'. These findings are consistent with other mobile payments research including Chandra et al. (2010); Kim et al. (2010); Peng et al. (2012); Polasik et al. (2012) and Pousttchi and Wiedemann (2007).

Perceived usefulness is a key influence on consumer attitude for smart phone adoption (Curran & Meuter, 2005; Davis, 1989; Park & Chen, 2007; Tsai & Ho, 2013; Yang, 2005) and internet banking in Hong Kong (Chau & Lai, 2003). However, these findings are inconsistent with other research that found that perceived usefulness has no influence on consumer intention to use contactless cards in Taiwan (Wang & Lin, 2008) or mobile commerce (Bhatti, 2007; Chong et al., 2012).

In summary, perceived usefulness is a vital element in encouraging consumer adoption of various self-service technologies (Kaushik & Raham, 2015; Mortimer et al., 2015; Yadav et al., 2015) and to change their habits (Ho & Ko, 2008) whilst any new payment service must be better than existing payment methods. However, Arvidsson (2014, p.164) suggests that consumers will not adopt mobile payments as there is "simply no reason to start using it". 42% of UK consumers prefer traditional payment methods according to Consumer Intelligence (2014) and UK consumers are satisfied with the current debit and credit card payment systems according to Pope et al. (2011). Furthermore, UK consumers are more hesitant in adopting new electronic payment devices than consumers in Asia and USA (GfK, 2014a). However, perceived usefulness

positively influences attitude for UK consumers as the benefits of mobile payments address specific consumer needs although UK consumers identify security concerns.

A number of UK consumers indicate that mobile payments are of interest if it provides a faster payment option over existing payment methods. This is consistent with MasterCard (2012b) whilst making a contactless touch and go payment is the quickest payment option at point of sale (Borzekowski & Kiser, 2008; Polasik et al., 2013). UK consumers also indicate interest in mobile payments for queue avoidance as perceived usefulness has a positive effect on attitude (Kim et al., 2010; Schierz et al., 2010). In particular, UK consumer interest in mobile payments is identified for queue avoidance in a high volume transport situation. This is consistent with Hayashi (2012) and Mallat et al. (2004) whilst UK consumer interest in mobile payments also exists with other public venues where there is a high volume of consumer payments made in a very short period of time (Chen, 2008).

Furthermore, UK consumers indicate that interest in mobile payments is device dependent as the payment transaction value can determine the actual mobile device used to make the payment (Boeschoten, 1998; Bounie & Francois, 2006). In addition, UK consumers also identify that the consumer selection of the upper payment value adds to perceived usefulness as it allows individual consumers to manage the mobile payment transaction limit relative to their propensity for risk and the device type being used for payment exchange.

As a result, research proposition 8, which proposes that perceived usefulness has a positive effect on UK consumer attitude to mobile payments, is generally supported.

7.4 Research Findings Summary

All of the research proposition findings are summarised in Table 2 – Research Propositions Summary below:

	<u>Research Proposition</u>	<u>Result</u>
1.	Personal characteristics have a positive effect on the perceived ease of use of mobile payments for UK consumers.	Not supported.
2.	Personal characteristics have a positive effect on the perceived usefulness of mobile payments for UK consumers.	Not widely supported.
3.	Perceived ease of use has a positive effect on the perceived usefulness of mobile payments for UK consumers.	Not widely supported.
4.	Perceived trust has a positive effect on the perceived usefulness of mobile payments for UK consumers.	Generally supported.
5.	Perceived trust of a bank by consumers will be higher than perceived trust of other mobile payment providers due to reduced perceived risk.	Generally supported.
6.	Perceived risk has a negative effect on the perceived usefulness of mobile payments for UK consumers.	Generally supported.
7.	Perceived ease of use has a positive effect on UK consumer attitude to mobile payments.	Not widely supported.
8.	Perceived usefulness has a positive effect on UK consumer attitude to mobile payments.	Generally supported.

Table 2 - Research Propositions Summary

7.4.1 Main research findings

When considering whether technology is easy to use, the majority of UK consumers perceive that technology is easy to use; a smart phone is easy to use; a mobile phone is easy to use and internet banking is easy to use. These are adopted by a large number of the participants regardless of age, gender and educational qualifications which is inconsistent with previous research that identifies individual consumer characteristics are key influences of perceived ease of use (Agarwal & Prasad, 1999; Shin, 2009). However, a consumer's subjective experience of, and active engagement with technology within their day to day life is one of the main reasons for technology adoption according to Phillips (1998). Consumer based technology has been extensively adopted by UK consumers (IDC, 2015; Ling, 2004) together with self-service technology adoption (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005). This may explain why these research findings identify that the individual consumer characteristics of age, gender and educational qualifications are no longer influential factors for perceived ease of use.

When considering whether risk negatively affects consumer attitude, UK consumers identify a number of perceived technology and security risks which is consistent with To and Lai (2014) and Zhou (2014) including the lack of PIN authentication for contactless payments. In addition, portable device loss or theft (Shin, 2009) is identified by UK consumers as a further security risk which has a negative effect on perceived usefulness of mobile payments (Swallow et al., 2005). Whilst payment guarantees can increase trust and offset perceptions of risk (Zhou, 2014) this is dependent upon consumers being aware of any payment guarantees (Clarke, 2008; Pan & Zinkhan, 2006). However, there is limited awareness of existing payment guarantees by UK consumers despite the fact that the major UK banks provide payment guarantees (Barclaycard, 2015a; HSBC, 2015; Royal Bank of Scotland, 2015). A number of UK consumer resistance points are identified but these can be overcome when the consumer benefits outweigh the risks particularly in the transport market (Hayashi, 2012; Kim et al., 2010; Mallat et al., 2004; Schierz et al., 2010). This is supported by the very positive early indications of UK consumer mobile payment adoption with

contactless bank cards (TfL, 2015; UK Cards Association, 2015a; UK Cards Association, 2015b).

When considering whether trust in established organisations positively affects consumer attitude, UK consumers indicate an increased level of trust in established organisations that provide mobile payments (Abrazhevich, 2001) including UK banks with a VISA and MasterCard brand association (Arvidsson 2014; Eriksson et al., 2005; Waris et al., 2006). In addition, recent technology developments of the NFC smart phone allows bank supported consumer mobile payments independent of a MNO (VISA, 2015a). A number of banks and other organisations around the world have indicated their adoption of this technology (ANZ, 2015; China UnionPay, 2015; Commonwealth Bank of Australia, 2015; Microsoft, 2015) including a number of UK banks who have launched pilot programmes (VISA 2014). These smart phone developments by UK banks further support the widespread UK consumer adoption of contactless mobile payments with the smart phone device as the next phase in the evolution of this phenomenon.

When considering whether perceived usefulness positively affects consumer attitude, significant UK consumer support is identified for the perceived usefulness of technology, a smart phone and internet banking which are adopted by a large number of the participants regardless of age, gender and educational qualifications. This is inconsistent with previous research that identified individual consumer characteristics including age, gender and educational qualifications are influences of perceived usefulness (Carow & Staten, 1999; Koenig-Lewis et al., 2010; Riquelme & Rios, 2010; Rouibah, 2009). A consumer's subjective experience of, and active engagement with technology within their day to day life is one of the main reasons for technology adoption according to Phillips (1998). The extensive adoption of consumer based technology by UK consumers (IDC, 2015; Ling, 2004) together with self-service technology adoption (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005) may explain why the individual consumer characteristics of age, gender and educational qualifications are no longer influences of perceived usefulness.

Over the last few years there has been a significant increase in the volume and value of contactless payments across the European Union supported by new regulations from Visa and MasterCard that will result in more retailers accepting this new payment instrument and more UK consumers will be issued with contactless cards. Initial adoption of contactless card mobile payments has occurred with UK consumers in London on public transport and has also started to be adopted at other UK retail organisations across the UK (MasterCard, 2015a; UK Cards Association, 2015b). As a result, widespread UK consumer adoption of mobile payments is expected to be based upon a contactless card device that supports the high volume market segments including public transport and toll booths (TfL, 2015; UK Cards Association, 2015b). Furthermore, increased UK consumer awareness of payment guarantees will assist in decreasing security concerns on the lack of PIN authentication which will support further adoption in specific market sectors where benefits can be easily identified and understood and should also lead to subsequent cross-sector adoption (van Hove, 2004). UK consumer adoption of bank supported mobile payments through a smart phone independent of the MNO (ApplePay, 2015; SamsungPay, 2015; VISA, 2015a) may extend further UK consumer adoption of mobile payments. As a result, the UK consumer adoption momentum of mobile payments is set to increase over the next few years according to RDR (2015) and the potential UK market evolution is shown in Figure 20 - The future of mobile payments below:

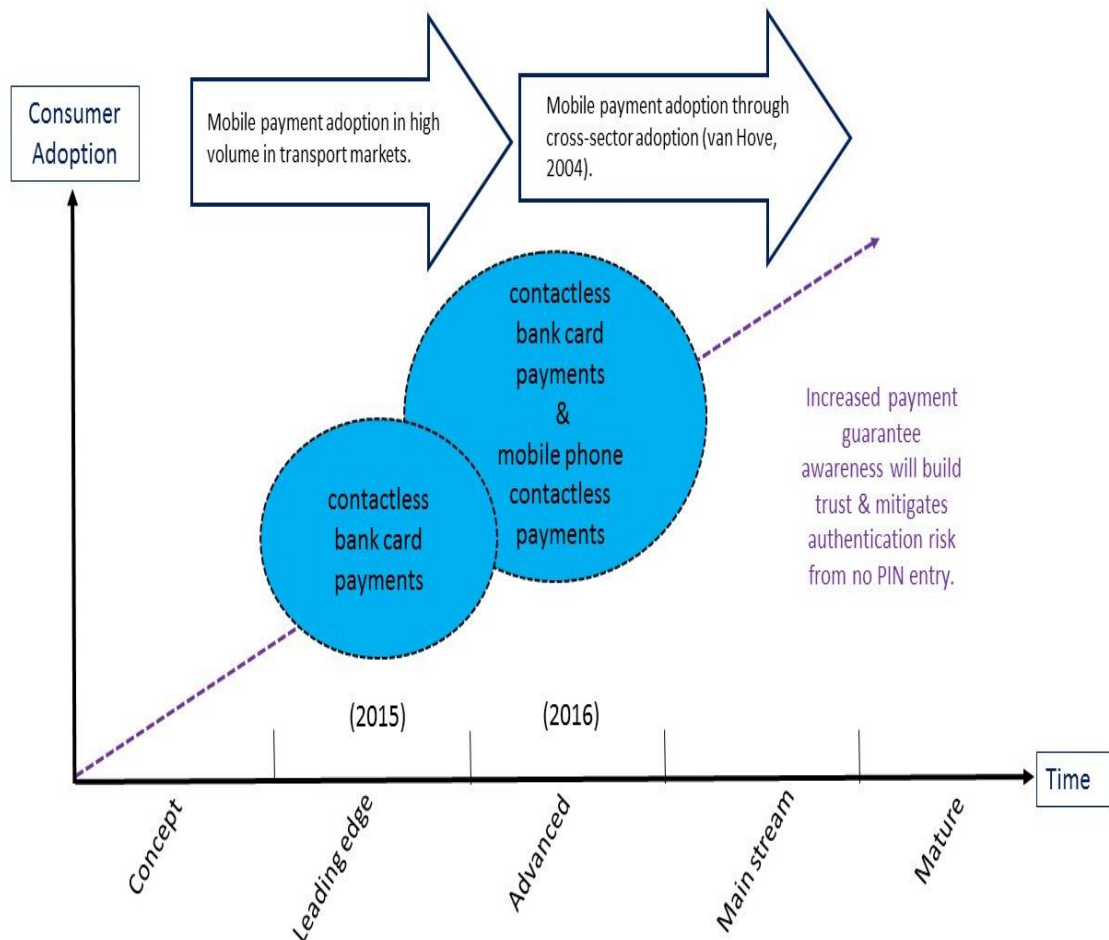


Figure 20 - The future of mobile payments

Developed by C C Hampshire (2015)

7.4.2 Further research findings

When considering whether convenience positively affects attitude, it is recognised that making a contactless payment is the quickest payment option at point of sale (Borzekowski & Kiser, 2008; Polasik et al., 2013). A number of UK consumers indicate that mobile payments are of interest if it provides a faster payment option over existing payment methods which is consistent with findings by MasterCard (2012b). UK consumers also indicate interest in mobile payments for queue avoidance where perceived usefulness has a positive effect on attitude (Kim et al., 2010; Schierz et al., 2010), particularly in a high volume transport situation (Hayashi, 2012; Mallat et al., 2004). This UK consumer interest also extends to other markets where a high volume of consumer payments is made in a very short period of time (Chen, 2008).

When considering whether awareness influences adoption, a large number of UK consumers have not heard of mobile wallets which is consistent with Bamasak (2011) although the majority of UK consumers have heard of contactless payments. However, consumer awareness of mobile wallet and contactless payment is a pre-requisite to any subsequent adoption as it is the fundamental first step in the process (Claudy et al., 2010; Howcroft et al., 2002; Pikkarainen et al., 2006; Rogers & Shoemaker, 1971; Sathye, 1999). Furthermore, consumer apathy still has to be overcome for those consumers who have heard of mobile wallets (Viehland & Leong, 2007). Consumers have to download, install and configure a mobile wallet application on their smart phone which are complex activities that add further hurdles to be overcome for widespread adoption (Mallat, 2007; Ondrus et al., 2005; Rochet & Tirole, 2002).

When considering whether ease of use positively affects attitude, UK consumers indicate that mobile phone technology is easy to use and a smart phone is easy to use but this has a very limited effect on behavioural intention to adopt mobile payments. This is inconsistent with Kleijnen et al. (2004) who identify that mobile payments with complex devices negatively affects ease of use perceptions whilst Chang et al. (2009) suggest that mobile phone applications and services are too complex.

Furthermore, a large number of UK consumers indicate that a smart phone is easy to use although it is predominantly used for core functionality (Osman et al., 2012; Matthews et al., 2009). However, UK consumers do not use all the Apps that are available on the smart phone which is consistent with Verkasalo et al. (2010). Perceived ease of use has a very limited effect on behavioural intention for contactless mobile payments for UK consumers which is consistent with Chandra et al. (2010); Chong et al. (2012); Khalifa and Shen (2008); Wang and Lin (2008) although perceived ease of use has a positive effect on the behavioural intention of consumers in Poland to use contactless cards (Polasik et al., 2012). In addition, perceived ease of use has a positive effect on behavioural intention for mobile payment consumers in Germany (Pousttchi & Wiedemann, 2007; Schierz et al., 2010).

In addition, UK consumer attitude to mobile payments is detrimentally affected by a registration process. This is consistent with Mallat (2007) although a simple electronic registration process can minimise this negative impact (Ondrus & Pigneur, 2005).

When considering whether trust positively affects attitude, the majority of UK consumers perceive their personal information is safe and secure with an increased level of trust in banking organisations with this personal information (Eriksson et al., 2005) whilst confidentiality of data is an important criteria (Pousttchi, 2003). Consumers trust banks to protect their card details and personal financial information far more than they do companies like Google, Apple and Amazon according to Bizrate Insights (2014). A majority of UK consumers also trust complex payment structures particularly those with a VISA or MasterCard brand association (Waris et al., 2006).

UK consumers also indicate trust in existing established organisations whilst there is a lack of trust towards unknown organisations or new market entrants which is consistent with Li et al. (2008). Furthermore, UK consumer trust in mobile payments is increased when payment guarantees are provided (Zhou, 2014). However, there is a lack of consumer awareness of existing payment guarantees (Clarke, 2008; Pan & Zinkhan, 2006). UK consumers also identify that a payment guarantee provided by a non-banking organisation may not be as strong as consumers expect which is consistent with Au and Kauffman (2007).

When considering whether perceived usefulness positively affects attitude, UK consumers identify that mobile payment adoption interest may be influenced by the electronic consumer payment device being used with the payment value being an influencing characteristic (Boeschoten, 1998; Bounie & Francois, 2006). In addition, UK consumer selection of the upper mobile payment value increases perceived usefulness as individual consumers can manage their own payment limit relative to their propensity for risk and the device type being used to make the payment. However, whilst UK consumers identify the benefits of mobile payments in certain markets there are also a number of important consumer security concerns that will need to be addressed by the mobile payment organisations in order to overcome consumer resistance which can lead to widespread adoption in the UK.

7.5 Mobile Payment UK Road Map

Whilst mobile payments have achieved mainstream adoption in a number of countries in the Far East, it is currently in the leading edge stage of the life-cycle in the UK (Diniz et al., 2011). 33% of UK consumers believe that electronic payments will replace cash in the next 5 years according to Lloyds Bank (2015) whilst 25% believe that mobile phone payments will be a daily occurrence by 2020 (VISA, 2015b). Mobile payment adoption by UK consumers is dependent upon widespread technology adoption although consumer oriented technology has become an integral part of, and embedded in today's society (Drucker, 2011) through consumer based technology adoption (IDC, 2015; Ling, 2004) and self-service technology adoption (Bolton & Saxena-Iyer, 2009). The empirical data obtained from the questionnaire and interviews indicates widespread adoption of technology and internet banking by UK consumers who also regard smart phones as easy to use. As a result, age, gender and education are no longer key influences on technology adoption by UK consumers which is consistent with Barclaycard (2015b) but contrary to findings from previous research (Amirkhani et al., 2011; Fain & Roberts, 1997; Luarn & Lin, 2005; Meuter et al., 2003; Saaksjarvi, 2003).

Despite widespread technology adoption, UK consumers indicate a resistance to mobile payment adoption due to a number of perceived technology and security risks and particularly the lack of PIN authentication for contactless payments (Lloyds Bank, 2015). However, consumer resistance to mobile payment adoption can be overcome when the benefits outweigh the risks such as the mass transport market (Hayashi, 2012; Kim et al., 2010; Mallat et al., 2004; Schierz et al., 2010) and early positive indications exist for contactless card adoption (TfL, 2015; UK Cards Association, 2015a). In addition, UK consumers indicate an increased level of trust in established organisations that provide mobile payments (Abrazhevich, 2001) and specifically UK banks with a VISA and MasterCard brand association (Arvidsson 2014; Eriksson et al., 2005; Waris et al., 2006). Initial mobile payments adoption generally occurs in the early stage of the life-cycle of the phenomenon. In the UK this is based upon consumer adoption of bank supported mobile payments with an EMV card as the contactless

device (Barclaycard, 2015b; TfL, 2015) which is a similar adoption to that of chip and PIN card payments (King, 2012).

Recent technology developments of the NFC mobile phone allows bank supported consumer mobile payments independent of a MNO using a smart phone or other complex technology device (VISA, 2015a). A number of non-UK banks have already indicated their adoption of this evolving technology (ANZ, 2015; Commonwealth Bank of Australia, 2015) whilst a number of UK banks have launched pilot programmes (VISA 2014). These mobile payment developments on smart phones by UK banks further support the widespread consumer adoption of UK bank supported contactless mobile payments with a smart phone device as the next phase in this mobile payment evolution.

Furthermore, as UK consumers adopt multiple technology devices that support mobile payments, consumer payment behaviour may develop so that both the value of the payment and the location of the payment being made may then influence the actual consumer payment device used.

7.6 Summary

This chapter reviewed the research findings for the eight research propositions identified and justified in the conceptual model. Out of the eight research propositions explored in this research, four of research propositions are generally supported by this research with one research proposition not supported and three research propositions not widely supported whilst three of these research propositions that are not supported in varying degrees relate to perceived ease of use.

Widespread UK consumer technology adoption is a pre-requisite to UK mobile payment adoption although consumer oriented technology has become an integral part of, and embedded in today's society (Drucker, 2011) through consumer based technology adoption (IDC, 2015; Ling, 2004) and self-service technology adoption (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005). UK consumers indicate that technology, internet banking and a smart phone are easy to use and as a result, age, gender and educational qualifications are no longer key influences on technology

adoption which is contrary to previous research including Amirkhani et al. (2011); Fain and Roberts (1997); Luarn and Lin (2005); Meuter et al. (2003); and Saaksjarvi (2003).

Furthermore, UK consumers identify technology and security risks with mobile payments including the lack of PIN authentication which are resistance factors to adoption. However, these resistance factors can be overcome when the benefits and perceived usefulness outweigh the risks such as the public transport market (Hayashi, 2012; Kim et al., 2010; Mallat et al., 2004; Schierz et al., 2010; TfL, 2015). In addition, UK consumers indicate an increased level of trust in established organisations that provide mobile payments (Abrazhevich, 2001) and specifically UK banks with a VISA and MasterCard brand association (Arvidsson 2014; Eriksson et al., 2005; Waris et al., 2006).

The next chapter reviews and evaluates the effectiveness of the conceptual model including each of the validated research propositions before suggesting how the conceptual model can be improved for future research. The implications of the findings on theory and practice are then explored before a review is provided of the contributions to the existing body of knowledge on consumer purchase behaviour and UK consumer attitude to the mobile payments phenomenon. This is then followed by the identification of the theoretical and methodological contributions and the limitations of this research are then acknowledged. The various opportunities for further research on consumer purchase behaviour and UK consumer perspectives of the mobile payments phenomenon are then identified before research reflections are provided followed by a chapter summary.

8 Research Conclusions and Reflections

8.1 Introduction

In the previous chapter the key questionnaire and interview facts are presented before each of the research proposition findings are reviewed and outlined in a consistent and accurate manner (Patton, 2002). The current UK mobile payments road map was then presented which identifies how UK mobile payments adoption has evolved with the introduction of the phenomenon to the UK before the chapter concluded with a summary of the research findings.

This chapter commences with a review and evaluation of the conceptual model and the effectiveness of the model in addressing the research objective including the research propositions before suggesting how the conceptual model can be improved for the benefit of future research. The implications of the research findings on theory and practice are then explored before the chapter goes on to identify the contributions to the existing body of knowledge on consumer purchase behaviour and consumer attitude towards mobile payment technology. The theoretical and methodological contributions are then identified followed by an acknowledgement of the limitations of this research. The various opportunities for further research are then identified which include UK consumer purchase attitude towards mobile payments, UK consumer mobile payment adoption patterns, and multi-country consumer perspectives of mobile payments. The research reflections on the journey of the researcher in producing this thesis are explored before concluding with a summary of the chapter and overall content.

This chapter structure has eight sections as shown in Figure 21 - Research Conclusions and Reflections below:

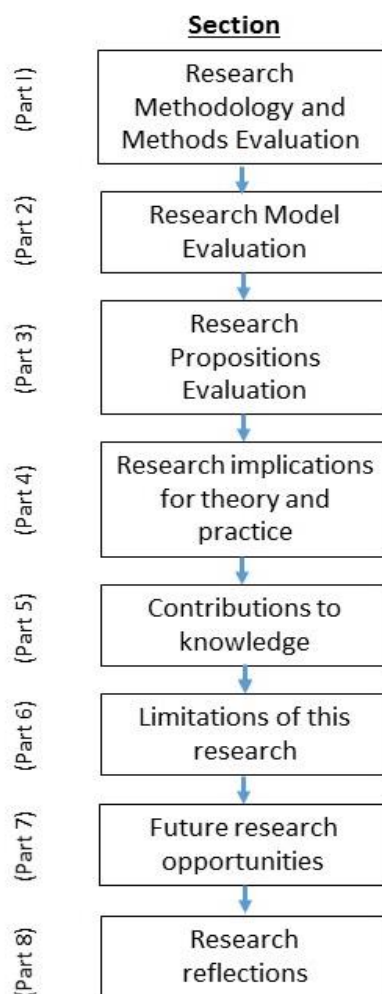


Figure 21 - Research Conclusions and Reflections

8.2 Research Methodology and Methods Evaluation

The research limitations are identified and explained in the earlier chapters although obstacles are encountered and overcome whilst undertaking this research and their implications for the data collected and conclusions drawn are explained. In addition, the limitations of the methodological approach and of the appropriateness of the research methods including data collection are reviewed.

One of the most significant methodological limitations is that the research uses a small-scale nature of inquiry which limits the generalisation of the findings (Hackley, 2003; Huberman & Miles, 2002) as the new knowledge created has a limited application to the wider community although this was never the intention (Ritchie, Lewis & Elam, 2003). In addition, the research is underpinned by a Social Constructionist ontology

which recognises that there are multiple versions of reality that can be constructed (Cavana et al., 2000). Furthermore, the research includes researcher subjectivity that includes the type of data collected, the participant selection, the subjective analysis and interpretation of the data collected (Quinlan, 2011).

However, the strength of this research approach is in the detail that the inductive sequential mixed methods approach provides which produces rich data that supports the significance of the research findings (Bryman, 1992; Webb et al., 2000). This produces an improved understanding of UK consumer perceptions of mobile payments but also provides a contrast with previous research on this phenomenon.

The accurate and detailed analysis process that is followed along with the interpretation and justification of the findings from the data allows other readers to determine the validity and relevance. As a result, the methodological approach that is used has enabled the development and implementation of the defined research strategy that is appropriate to the research aims that are documented in Chapter 1.

When considering the research methods evaluation, a questionnaire and interviews are used as the empirical data collection methods and these were explained and justified in chapter 5 - Research Philosophy, Strategy, Design and Administration, although the participant selection methods also present limitations. As a result, collection of empirical consumer data relies upon volunteer participants and therefore was dependent upon the willingness of respondents and interviewees to participate. Access to electronic respondents was obtained through LinkedIn and Facebook and as a result it is not known to what extent the responses have bias in their responses. In addition selection of interviewees is based upon a convenience sample where the interviewees are known to the researcher. The use of these selection approaches means that the data gathered may not reflect the wider UK consumer base. Furthermore, whilst these research methods have considerable strengths in exploring consumer perceptions, the problems encountered in practice and the inherent limitations of these are illustrated below in Table 3 - Methods limitations arising whilst conducting the research:

<u>Problem</u>	<u>Response</u>	<u>Response Limitations</u>
A limited number of respondents who could be encouraged to complete the questionnaire due to consumer and researcher time constraints.	Obtain as large a sample of respondents as was possible in the time period whilst recognising the exploratory nature of this research (Robson, 2011).	A number of responses may not have been obtained that may have been significant and influenced the overall picture that was achieved.
A limited number of interviewees who could be encouraged to complete the interviews due to consumer and researcher time constraints.	Obtain as large a sample of interviewees as was possible in the time period whilst recognising the exploratory nature of this research (Robson, 2011).	As above
Omission of some consumer groups due to the research methods used.	Gaining as broad a sample of questionnaire respondents and interviewees as was possible.	As above
Researcher's inexperience of using the interview method.	Use of the semi-structured interview guide to ensure relevant interview dialogue.	Researcher may have missed important nuances that a more experienced interview researcher would have identified.
Unable to establish data saturation that a more positivist qualitative researcher might seek.	Use of a pragmatic approach and adapt the research tools to fit the research purpose (Miles & Huberman, 2014).	A number of consumer perceptions may not have been identified.

Table 3 - Methods limitations arising whilst conducting the research

Furthermore, mobile payments is relatively new phenomenon and a growth research area and whilst a thorough and systematic review of relevant literature is undertaken over a 3+ year period it is possible that key relevant texts may not have been included although limitations have to apply which are acknowledged. However, despite the limitations identified with the research approach and the limitations that arose whilst undertaking this research, this is a valuable piece of research on UK consumer perceptions of mobile payments. Furthermore, this research contributes to the understanding of this relatively new phenomenon in the UK and offers a number of suggestions for future research that can build upon this research and these findings.

8.3 Research Model Evaluation

The TAM is an influential research model that was originally developed and used to evaluate technology adoption in organisations (Davis, 1989) although the main constructs have subsequently been successfully applied to other scenarios including self-service technology adoption by consumers (van Biljon & Kotze, 2008). As identified and justified earlier, the conceptual model used in this research uses the original core TAM framework of perceived usefulness and perceived ease of use and extends this by including 3 additional constructs to explore whether perceived usefulness is influenced by perceived trust, perceived usefulness is influenced by perceived risk and whether perceived risk is influenced by perceived trust. A trust construct extension to the original TAM is important according to Gu et al. (2009) who suggest that trust influences perceived usefulness whilst Pavlou (2003) identifies that trust is a determinant of perceived usefulness in e-commerce. In addition, a risk construct extension to the original TAM is important as consumer perception of risk is a key influence on technology focussed behaviour according to Cai et al. (2004) as it negatively affects consumer intention to adopt mobile payments (Chen, 2008). However, Morrison and Firmstone (2000) suggest that risk and trust are inter-related in consumer decision making and trust is an effective method used by consumers to address perceived risk (Gefen, 2000). These three additional construct extensions to the TAM and the associated research propositions are subsequently supported by this research although a number of the original TAM constructs are not supported.

The analysis of the empirical questionnaire data and interview data confirms the validity of four research propositions despite the identification of a number of UK consumer resistance points that are obstacles to the successful adoption of mobile payments. These obstacles will need to be addressed by mobile payment organisations in order to influence UK consumer attitude and purchase behaviour to support widespread adoption. A full detailed evaluation of the individual research propositions was provided in Chapter 7.3 Research Proposition Findings whilst the outcomes for each of the research propositions explored are summarised in Figure 22 - Research Proposition Findings below:

Conceptual Model Propositions

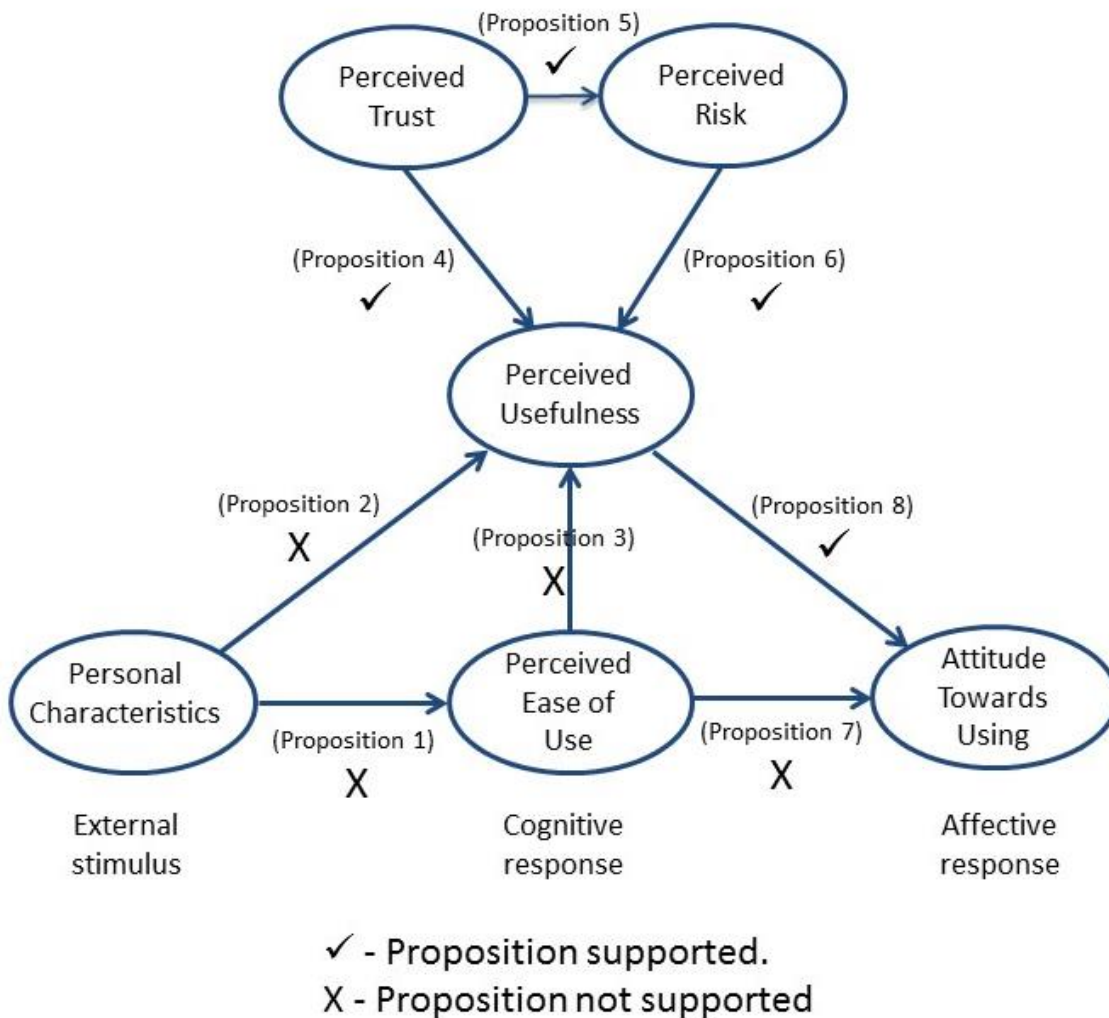


Figure 22 - Research Proposition Findings

Developed by C C Hampshire (2015) from Technology Acceptance Model (Davis, 1989)

The conceptual model is based upon the core constructs of perceived ease of use and perceived usefulness and extended to include additional trust and risk constructs which is a valid model to evaluate UK consumer perspectives of mobile payments as demonstrated by a number of the research results. However, consumer oriented technology has become an integral part of, and embedded in today's society (Drucker, 2011) through consumer based technology adoption (IDC, 2015; Ling, 2004) and self-service technology adoption (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005). As a result, future research may wish to consider whether the perceived ease of use constructs should be included as widespread consumer technology may now have negated this influence.

The detailed evidence that supports the outcome for each of the research propositions was provided in Chapter 7.3 Research Proposition Findings whilst a summary of the individual research propositions is provided below.

8.4 Research Propositions Evaluation

As identified from the numerical analysis of the questionnaire responses and the subsequent qualitative analysis of the interviewee data there is a pattern that shows age, gender and educational qualifications are no longer key influences on perceived ease of use for UK consumers. The majority of UK consumers perceive that technology is easy to use; a smart phone is easy to use; a mobile phone is easy to use and internet banking is easy to use and are adopted by a large number of the participants regardless of age, gender and educational qualifications. As a result, these findings provide a significant divergence from previous research that identifies individual consumer characteristics of age, gender and educational qualifications influence perceived ease of use (Agarwal & Prasad, 1999; Shin, 2009). Technology is now an integral part of society (Drucker, 2011) through extensive adoption of consumer based technology (IDC, 2015; Ling, 2004) and self-service technology adoption (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005). Furthermore, previous experience of consumer based technology and self-service technology generates a more positive attitude towards technology adoption by consumers. This widespread adoption of complex technology by UK consumers may explain why individual characteristics of age, gender and

educational qualifications are no longer key influential factors on perceived ease of use of mobile payments for UK consumers which is consistent with Thong, Hong and Tam (2006).

When considering whether personal characteristics have a positive effect on perceived usefulness of mobile payments for UK consumers, the perceived usefulness of technology, a smart phone and internet banking is supported by the majority of UK consumers and these are adopted by a large number of the participants independent of age, gender and educational qualifications. These findings provide a significant divergence from previous research that identifies individual consumer characteristics of age, gender and educational qualifications influence perceived usefulness (Koenig-Lewis et al., 2010; Riquelme & Rios, 2010; Rouibah, 2009). As identified with perceived ease of use, technology is now an integral part of society (Drucker, 2011) and widespread adoption of complex technology by UK consumers may explain why individual characteristics of age, gender and educational qualifications are no longer key influential factors on perceived usefulness of mobile payments for UK consumers.

When considering whether perceived ease of use has a positive effect on perceived usefulness, this research identifies that perceived ease of use does not generally have an influence on perceived usefulness of mobile payments for UK consumers. These findings are contrary to previous research that identifies that perceived ease of use is a dominant influence on perceived usefulness for mobile payments and internet banking (Al-Somali et al., 2009; Igarria et al., 1997; Kim et al., 2010) although it is consistent with Chari et al. (2000); Kristoffersen, Synstad and Sorli (2008); VocaLink (2015b); and Wang, Streff and Raman (2012). However, as identified earlier, age, gender and educational qualifications are no longer influences on perceived ease of use and this may have a subsequent effect when exploring the impact of perceived ease of use on perceived usefulness.

When considering whether perceived trust has a positive effect on perceived usefulness, consumer confidence in the security of personal information is an influence on UK consumer attitude to mobile payments. Furthermore, UK consumers perceive that making a mobile payment has technology and security risks which is consistent

with To and Lai (2014) and Zhou (2014) and these have a negative effect on perceived usefulness which is consistent with Swallow et al. (2005). However, UK consumers trust mobile payments when a guarantee is provided whilst awareness of payment guarantees generates trust for UK consumers. In addition, structural assurances including payment guarantees positively and significantly influence trust in mobile payments which is consistent with other research (Kim et al., (2009; Xin et al., 2013). As a result, this research identifies that perceived trust has a positive influence on the perceived usefulness of mobile payments for UK consumers which is consistent with Gu et al. (2009); Linck et al. (2006) and Schierz et al. (2010).

When considering whether perceived trust of a bank by UK consumers will be higher than perceived trust of other mobile payment providers due to reduced risk, UK consumers have an increased level of organisational and reputational trust with UK banks compared to other organisations which is consistent with Dahlberg et al. (2003); Lexis (2011) and Mallat (2007). UK consumers indicate a preference for mobile payments provided by an established UK bank compared to a MNO or other payment organisation although UK consumers also indicate a comparable level of trust in other established global companies such as Google or PayPal compared to MNOs. As a result, this research identifies that perceived trust of a bank by UK consumers is higher than perceived trust of other mobile payment providers. However, these findings may reflect consumer confidence in a mobile payment organisation is significantly affected by the organisation's reputation (Anderson & Weitz, 1989; Chandra et al., 2010; Egger & Abrashevich, 2001) which is a strong influence on initial consumer trust (Li et al., 2008). Furthermore, a positive reputation increases consumer trust in the absence of any first-hand knowledge or experience (Lohse & Spiller, 1998) whilst any trust that already exists between a consumer and a bank has a positive effect on reducing any perceived mobile payment risks through the trust transfer process (Kuan & Bock, 2007; Zhou 2014).

When considering whether perceived risk has a negative effect on perceived usefulness of mobile payments for UK consumers, making a mobile payment has technology and security risks (To & Lai, 2014; Zhou, 2014) that include the lost or stolen technology devices like smart phones which is consistent with Shin (2009) and Swallow et al.

(2005).). Furthermore, UK consumers believe that contactless cards have risks that outweigh the advantages (Wang & Lin, 2008) whilst existing PIN authenticated payments have a large degree of consumer trust. As a result, this research identifies that risk has a negative effect on perceived usefulness of mobile payments for UK consumers and this is consistent with Swallow et al. (2005) for mobile payments and Mortimer et al. (2015) for mobile banking.

When considering whether perceived ease of use has a positive effect on UK consumer attitude to mobile payments, a registration process has a negative influence on UK consumer attitude which is consistent with Dahlberg et al. (2003) and Viehland and Leong (2007). UK consumers perceive a smart phone is easy to use which is inconsistent with Kleijnen et al. (2004) and smart phones have been widely adopted by UK consumers (IDC, 2014; Ling, 2004) which is independent of age, gender and educational qualifications. These findings are a significant divergence from previous research including Carow and Staten, 1999; Koenig-Lewis et al., 2010; Riquelme and Rios, 2010; and Rouibah, 2009. However, as identified earlier, technology is now an integral part of society (Drucker, 2011) through extensive adoption of consumer based technology (IDC, 2015; Ling, 2004) and self-service technology adoption (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005) which may explain why perceived ease of use is no longer influential on consumer attitude. As a result, this research identifies that perceived ease of use does not have a large influence on UK consumer attitude to mobile payments.

When considering whether perceived usefulness has a positive effect on UK consumer attitude to mobile payments, mobile payments are of interest to UK consumers if it provides a faster payment option than existing payment methods and are useful to avoid queues particularly in a high volume transport situation which is consistent with previous research (Chicago Transit, 2014; Hayashi, 2012; Mallat et al., 2004). As a result, this research identifies that perceived usefulness has a positive influence on UK consumer attitude to mobile payments.

In summary, the research findings validate the use of a number of existing constructs of TAM and the additional constructs within the extended TAM used as the conceptual

model. However, whilst a number of research propositions are supported there are also a number of research propositions that are not supported, or not widely supported, particularly related to the various perceived ease of use constructs. As a result, the conceptual model used in this mobile payments research can be extended and improved in future research by excluding those propositions that are not supported whilst extending those research propositions that are supported.

8.5 Research Implications for Theory and Practice

A majority of UK consumers perceive that technology is easy to use; a smart phone is easy to use; a mobile phone is easy to use and internet banking is easy to use. In addition, technology is now widely adopted by a large number of UK consumers regardless of age, gender and educational qualifications. This is in contrast to previous research that identifies these demographic characteristics are key influences of perceived ease of use (Agarwal & Prasad, 1999; Kim et al., 2010; Phan & Daim, 2011; Shin, 2009). Widespread UK adoption of consumer based technology (IDC, 2015; Ling, 2004) and self-service technology (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005) may explain why these individual consumer characteristics are no longer an influence on perceived ease of use. Future research can use the same research methods and questions with other UK consumers to explore perceived ease of use of mobile payments to establish if these research findings are consistent with the wider UK consumer population. As a limited number of demographic questions are used to explore perceived ease of use, future research can also explore UK consumer perceptions of ease of use of mobile payments through the inclusion of alternative demographic characteristics that may be more appropriate for exploring UK consumer perceptions of the mobile payments phenomenon. In addition, future research can explore further this change in UK consumer perception of ease of use of technology within the affective human psychology response framework in order to ascertain if these research findings apply in a broader context within the UK but also across other countries.

UK consumer awareness of the various types of mobile payment including contactless payment and mobile wallet is a pre-requisite to any subsequent adoption as it is the

fundamental first step in the process (Claudy et al., 2010; Howcroft et al., 2002; Pikkarainen et al., 2006; Rogers & Shoemaker, 1971). 43% of questionnaire respondents indicated an awareness of mobile wallets and 79% indicated awareness of contactless payments whilst VocaLink (2015a) identified that 66% of UK consumers are aware of mobile payments. Future research can explore the UK consumer awareness of mobile payments to establish if these research findings are consistent with the wider UK consumer population. In addition, future research can explore mobile payment awareness generally but also with specific consumer enabled technology devices that would provide further UK consumer perspectives of the mobile payments phenomenon.

As identified earlier, a mobile payment registration process has a negative influence on UK consumer perceived ease of use which is consistent with Mallat (2007) although a simple electronic registration process can minimise any impact (Ondrus & Pigneur, 2005). In addition, smart phones require a consumer to install and use an electronic wallet that also requires navigation to the payment screen to facilitate a mobile payment (SamsungPay, 2015b) and these additional consumer steps provide further barriers to adoption (Mallat, 2007; Ondrus et al., 2005; Rochet & Tirole, 2002). Further research can explore how much these additional steps are barriers for UK consumer adoption. In addition, future research can explore the UK consumer motives behind adoption of a mobile wallet but also exploring the ease of use of mobile wallets across the alternative mobile wallet options including AndroidPay (2015); ApplePay (2015a); LGPay (2015) and SamsungPay (2015a).

UK consumers believe mobile phones and smart phones are easy to use although consumers do not use all the services available on the mobile phone (Verkasalo et al., 2010). Increased UK consumer knowledge of computers and smart phones are important factors that can lead to improved perception of the usefulness of technology and can result in wider UK consumer adoption of mobile payments (Keramati et al., 2011). Future research can use the same research methods and questions with other UK consumers to explore perceived usefulness of mobile payments to establish if these research findings are consistent with the wider UK consumer population. As a limited number of demographic questions are used to explore perceived usefulness, future

research can also explore UK consumer perceptions of usefulness of mobile payments through the inclusion of alternative demographic characteristics that may be more appropriate for exploring UK consumer perceptions of the mobile payments phenomenon.

Extensive consumer support is identified for the perceived usefulness of technology including a smart phone and internet banking whilst technology is adopted by a large number of the participants regardless of age, gender and educational qualifications which is inconsistent with previous research (Carow & Staten, 1999; Koenig-Lewis et al., 2010; Riquelme & Rios, 2010; Rouibah, 2009). The recent widespread UK adoption of consumer based technology (IDC, 2015; Ling, 2004) together with self-service technology (Bolton & Saxena-Iyer, 2009; Curran & Meuter, 2005) may have influenced consumer perception of the perceived usefulness of technology. A limited amount of UK consumer data is obtained from questionnaires and interviews with this research and as a result, this research can be repeated with a wider audience of UK consumers to establish if the findings on perceived usefulness of technology are consistent with the wider UK consumer population.

Perceived usefulness is a key influence on UK consumer attitude towards mobile payments and has a persuasive effect on consumer change of habits (Ho & Ko, 2008) but in itself, is unlikely to lead to widespread adoption. The key influence of perceived usefulness is based upon a limited amount of UK consumer data that is obtained from questionnaires and interviews and as a result, future research could explore whether perceived usefulness of mobile payments is a key influence with the wider UK consumer population. However, whilst perceived usefulness is a key criteria for UK consumer adoption of mobile payments this, in itself, is unlikely to lead to widespread adoption. Mobile payment organisations will need to fully address UK consumer security concerns which are consistent with other research findings (GfK, 2014b; OFCOM, 2014), although these security concerns are just one of several negative influences that are potential barriers to successful adoption.

A contactless touch and go mobile payment using a card is the quickest payment option at point of sale (Borzekowski & Kiser, 2008; Polasik et al., 2013) although this research

identifies that consumers have security concerns with this payment method compared to PIN validated payments. Future research can explore UK consumer concerns of the faster payment option with contactless cards and no PIN validation. Furthermore, as alternative consumer held electronic devices that support mobile payments are adopted future research can also explore UK consumer interest in these alternative consumer enabled payment devices for non-PIN validated payments.

UK consumers show interest in mobile payments for queue avoidance where perceived usefulness has a positive effect on consumer attitude (Kim et al., 2010; Schierz et al., 2010) whilst queue avoidance in a high volume transport situation is an area that is suitable for rapid adoption of mobile payments (Hayashi, 2012; Mallat et al., 2004). In addition, other public venues where there is a high volume of consumer payments made over a very short period of time may also be suitable for early adoption (Chen, 2008). Future research can explore queue avoidance with mobile payments in different UK market segments to establish if the benefits identified by this research also apply to the wider UK market. In addition, mobile payment organisations may wish to prioritise the acceptance of mobile payments on public transport and road toll booths plus other external events to secure and maximise early UK consumer adoption.

The electronic payment device used for mobile payments may also be an influence on UK consumer adoption as the payment transaction value may determine which mobile payment device the consumer uses (Boeschoten, 1998; Bounie & Francois, 2006). Future research can explore UK consumer interest in payment transaction values and the mobile payment devices to identify the drivers and inhibitors for any variance in mobile payment values by device type.

Consumer self-selection of an upper mobile payment limit would allow each consumer to manage their own mobile payment limit consistent with each consumer's propensity for risk and this may be influenced by payment device type, payment value and the location that the payment is being from. The ability of individual UK consumers to manage the mobile payment upper limit is an additional feature that may increase perceived usefulness which can lead to wider adoption. Future research can explore UK consumer appetite for risk with mobile payments across a range of scenarios to

ascertain if risk based mobile payment upper limit is a positive influence on adoption. In addition, mobile payment organisations may wish to explore whether the self-selection of an upper mobile payment limit and any associated business risks would support increasing UK consumer mobile payment adoption rates.

Furthermore, even if UK consumer concerns are fully addressed, consumers may still not sufficiently engage for widespread adoption of mobile payments which Pousttchi (2004, p. 263) describes as “fulfilling essential conditions only removes obstacles”. Consumers are reticent at changing their payment habits including the choice of payment instrument used unless the right incentives apply and specific benefits can be identified and understood (Riggins et al., 1994). As a result, mobile payment organisations may wish to target UK consumer adoption in very specific markets where clear benefits can be communicated in the marketing literature and easily understood by consumers in order to overcome any initial adoption barriers (Abrazhevich, 2001).

UK consumers believe that mobile payments are easy to use and that learning how to make a mobile payment will also be very easy which is inconsistent with other mobile payment research (Chandra et al., 2010; Eriksson et al., 2005; Khalifa & Shen, 2008; Peng et al., 2012) although perceived ease of use is not an influence on UK consumer attitude towards mobile payments. However, perceived usefulness through the identification of specific consumer needs is a key influence for widespread adoption. Mobile payment organisations will therefore need to ensure that their mobile payment service meets an unambiguous consumer need as no amount of ease of use compensates for the absence of usefulness (Eriksson et al, 2005; Wang et al., 2003). All marketing communications provided by mobile payment organisations to UK consumers needs to clearly identify the specific consumer benefits that UK consumers can understand in order to overcome resistance that leads to adoption.

The perceived usefulness of mobile payments in high volume transport situations such as public transport and toll booth scenarios including Mersey Tunnel provides opportunities where the consumer benefits can be easily explained and understood and is consistent with other research (Chicago Transit, 2014; Hayashi, 2012). Furthermore, the concept of targeting specific consumer markets for introducing

mobile payments where relative advantage is the highest and the benefits can be easily understood by consumers is also consistent with van der Heijden (2002). Future research can explore relative advantage and specific benefits to ascertain whether some consumer benefits are more influential on mobile payment adoption for UK consumers.

This research identifies that UK consumers have a preference for mobile payments provided by a UK bank compared to a MNO or other payment organisation, despite the comparable level of trust indicated by consumers in other payment companies such as Google or PayPal. However, there is a lack of consumer awareness of the mobile payment risks that exist with non-bank payment organisations (Chande, 2008) whilst the reputation of the mobile payment organisation is an important trust building factor (Chandra et al., 2010). The trust transfer process is a benefit to established organisations and as a result, organisations with a well-established brand and reputation can extend this into mobile payments easier than new entrants (Kuan & Bock, 2007; Zhou 2014). UK Banks can use this existing trust in the organisation to maximise UK consumer interest in their mobile payment offering. A limited amount of UK consumer data is obtained from questionnaires and interviews with this research and as a result, this research can be repeated with a wider audience of UK consumers to establish if the findings on organisational trust are consistent with the wider UK consumer population.

Confidentiality and security of data is an important criteria for UK consumer adoption (Pousttchi, 2003) whilst UK consumers have an increased level of trust that their personal information is safe and secure with established UK banking organisations which is consistent with other research (Bizrate Insight, 2014; Eriksson et al., 2005). In addition, the majority of UK consumers also trust complex payment structures particularly those with a VISA or MasterCard brand association (Waris et al., 2006). However, there is a lack of trust by UK consumers towards unknown organisations or new market entrants which is consistent with Li et al. (2008). Future research can explore UK consumer perceptions of trust and data security using different trust perspectives and using different research methods whilst repeating this trust research at a later date will also provide a longitudinal perspective.

PIN authenticated payments have established a substantial degree of UK consumer trust as a payment mechanism whilst mobile contactless payments do not require PIN authentication. UK consumers have security concerns with mobile payments despite the consumer trust in complex payment structures (Waris et al., 2006). UK consumers also have significant concerns with portable device loss or theft (Shin, 2009; Swallow et al., 2005) with the subsequent potential mobile payment fraud transactions when no consumer authentication is required to make a payment. As a result, UK consumers perceive that making a mobile payment has technology risks and security risks (To & Lai, 2014; Zhou, 2014) which have a negative effect on perceived usefulness of mobile payments (Swallow et al., 2005). Future research can explore UK consumer perceptions of risk using different risk criteria whilst repeating this risk related research at a later date will also provide a longitudinal perspective.

Whilst contactless cards are perceived to be very easy to use this has no effect on UK consumer intention to use this payment instrument as the perceived risks outweigh the advantages (Wang & Lin, 2008) due to the security concerns including no PIN authentication. Payment guarantees offset perceptions of risk as these increase trust but are only effective when consumers are aware that payment guarantees exist (Clarke, 2008; Pan & Zinkhan, 2006). However, payment guarantees provided by a non-banking organisation may not be as strong as consumers expect (Au & Kauffman, 2007). As identified earlier, there is a lack of awareness by UK consumers of the existing payment guarantees provided by the UK banks (Barclaycard, 2015a; HSBC, 2015; Royal Bank of Scotland, 2015). As a result, mobile payment organisations will need to ensure that UK consumers are fully aware of the payment guarantees as this is a key influence in overcoming resistance which leads to adoption. Future research can explore whether UK consumer awareness of mobile payment guarantees has changed over the intervening period thereby providing a longitudinal perspective. In addition, future research can also explore UK consumer awareness of the different payment guarantees provided by the various mobile payment organisations and whether UK consumers understand the different guarantees available dependent upon the mobile payment organisation.

This research focussed on exploring UK consumer cultural perceptions of mobile payments that is framed by the existing UK consumer payments market. Future research can explore non-UK consumer perceptions of mobile payments; particularly consumers in the different continental Europe countries where alternative consumer payment methods exist including PIN authentication but also each country in Europe has different cultural consumer perspectives independent of the consumer payment methods.

For practitioners this thesis provides a sound basis for understanding those validated constructs in the conceptual research model which are crucial for the successful design and implementation of consumer based mobile payments that lead to adoption. These research findings can also assist mobile payment organisations in the development and deployment of mobile payments as different consumer affective and cognitive responses within human psychology are explored that affect UK consumer attitude that lead to adoption. In addition, practitioners need to consider carefully the UK consumer benefits and consumer requirements when integrating mobile payments into Apps on hand-held devices.

8.6 Contributions to Knowledge

8.6.1 Empirical contributions

Mobile payments is a relatively new and evolving phenomenon for the UK and the majority of western European countries (Diniz et al., 2011). This thesis contributes to contemporary research as it provides a perspective of UK consumer perceptions of mobile payments based upon an empirical study conducted in the UK in 2014. Adoption of mobile payments is dependent upon the widespread technology adoption by UK consumers as a first step in the process although consumer oriented technology has become widely adopted and an integral part of, and embedded in today's society (Drucker, 2011). The key empirical contributions are summarised in Table 4 - Empirical Contribution Summary below and each of these is then explained in detail thereafter.

1.	The majority of UK consumers now perceive technology generally, and smart phones specifically, are regarded as easy to use independent of age, gender or education which is contrary to previous research findings (Carow & Staten, 1999; Koenig-Lewis et al., 2010; Riquelme & Rios, 2010; and Rouibah, 2009).
2.	Perceived usefulness of technology is independent of age, gender and education for UK consumers which is contrary to previous research findings (Amirkhani et al., 2011; Luarn & Lin, 2005; Meuter et al., 2003; Saaksjarvi, 2003).
3.	UK consumers identify that mobile payments have technology and security risks including the lack of PIN authentication although these inhibitors can be overcome when specific consumer needs are met as the adoption benefits outweigh the risks e.g. the public transport market (Hayashi, 2012; Kim et al., 2010; Schierz et al., 2010).
4.	Payment guarantees offset perceived security risks, although a number of UK consumers are not aware of the existing mobile payment guarantees which is consistent with Clarke (2008) and Pan and Zinkhan (2006).
5.	UK consumers have an increased level of trust in reputable and established organisations, especially UK banks that provide mobile payments which is consistent with Abrazhevich (2001).
6.	A number of UK consumers are unaware of mobile wallets whilst a smaller number of consumers are unaware of contactless payments although awareness is a pre-requisite to adoption (Claudy et al., 2010; Howcroft et al., 2002; Rogers & Shoemaker, 1971).
7.	Consumer perceptions of mobile payments are extended beyond the historical perspective of a mobile phone device to consumer self-service technology including smart phones and contactless cards although other mobile consumer devices now include tablet computers, watches and glasses (Apple, 2014a; Google, 2014; Little, 2011; Samsung, 2014; Swatch, 2015).

Table 4 - Empirical Contribution Summary

The majority of UK consumers now perceive technology generally, and smart phones specifically, as easy to use independent of age, gender or education. Perceived usefulness of technology is also independent of age, gender and education for UK consumers which is contrary to previous research findings (Amirkhani et al., 2011; Luarn & Lin, 2005; Meuter et al., 2003; Saaksjarvi, 2003). In addition, existing mobile payments literature indicates how consumers experience and understand mobile payments within the social context of a mobile phone handset. Consumer perceptions of mobile payments are extended beyond the historical perspective of a mobile phone device to consumer self-service technology including smart phones and contactless cards although other mobile consumer devices now include tablet computers, watches and glasses (Apple, 2014a; Google, 2014; Little, 2011; Samsung, 2014; Swatch, 2015). Furthermore, the increased UK consumer adoption of multiple technology devices that support mobile payments has a positive effect on consumer payment behaviour as UK consumers suggest that different mobile payment amounts may apply dependent upon the actual electronic payment device being used and the location.

UK consumers identify a number of technology and security risks with mobile payments including the lack of PIN authentication which is a resistance factor to wider adoption as it negatively affects attitude. However, consumer resistance can be overcome when technology adoption meets specific consumer needs and the benefits of adoption outweigh any risks such as the use of mobile payments in the public transport market (Hayashi, 2012; Kim et al., 2010; Mallat et al., 2004; Schierz et al., 2010). In addition, this research identifies that payment guarantees also offset perceived security risks, although a number of UK consumers are not aware of the existing mobile payment guarantees. Furthermore, UK consumers are also reticent at changing their payment habits including the choice of payment instrument used. However, this resistance can be overcome when the consumer benefits of using the mobile payment instrument have been identified and understood (Riggins et al., 1994).

UK consumers have an increased level of trust in reputable and established organisations that provide mobile payments which is consistent with Abrazhevich (2001). In addition, UK consumers have an increased level of trust in UK banks with a VISA and MasterCard brand association which is consistent with previous research

(Arvidsson 2014; Eriksson et al., 2005; Waris et al., 2006). Whilst UK consumers also indicate a level of trust in MNO and other mobile payment organisations including Google and PayPal the level of trust is not as high as that for UK banks. In addition, UK consumers also indicate a lack of trust towards unknown organisations or new market entrants which is consistent with Li et al. (2008).

As a result, existing mobile payment organisations with a good reputation and positive customer relationships can leverage this trust to encourage and support mobile payment adoption. However, new mobile payment providers that enter the UK market with no previous established reputation will need to directly address this lack of trust by UK consumers (Kuan & Bock, 2007; Zhou, 2014).

A number of UK consumers are unaware of mobile wallets whilst a smaller number of consumers are unaware of contactless payments although awareness is a pre-requisite to adoption (Claudy et al., 2010; Howcroft et al., 2002; Rogers & Shoemaker, 1971). Furthermore, a number of consumers are unaware of existing mobile payment guarantees which is consistent with Clarke (2008) and Pan and Zinkhan (2006). However, UK consumers indicate a significantly increased level of trust in organisations that provide a mobile payment guarantee which is consistent with Zhou (2014). Furthermore some UK consumers are aware that a payment guarantee provided by a non-banking organisation may not be as strong as consumers may expect which is consistent with Au and Kauffman (2007).

As a result, mobile payment organisations should identify the consumer benefits in marketing communications and will need to ensure that UK consumers:

- Are fully aware of the payment guarantees as these offset perceived security concerns which leads to wider adoption.
- Are aware of the various mobile payment instruments that can be used.
- Fully understand how to install and operate mobile wallets.
- Are aware of the payment guarantees and the strength of the payment guarantee, as this significantly increases trust which mitigates perceived risks and leads to adoption.

The above empirical contributions extend the current body of knowledge on consumer perceptions of technology including mobile phones, smart phones, contactless cards and other consumer technology devices. In addition, the empirical contributions also extend the current body of knowledge on consumer purchase behaviour and provides a UK consumer perspective on the mobile payments phenomenon.

8.6.2 Theoretical and Methodological contributions

The key theoretical and methodological contributions are summarised in Table 5 - Theoretical and Methodological Contribution Summary below and then each of these is then explained in detail thereafter:

Extended TAM	<p>The original TAM developed by Davis (1989) is extended into an enhanced conceptual model through the addition of perceived trust and perceived risk constructs. Empirical evidence of UK consumer perceptions of mobile payments is provided based upon an extended TAM.</p> <p>Perceived usefulness is a very important influence on UK consumer attitude towards mobile payments which is consistent with Chicago Transit (2014); Hayashi (2012); Kim et al. (2010); MasterCard (2012b); Schierz et al. (2010); and UK Cards Association (2015b).</p> <p>Perceived ease of use is not an influence on UK consumer attitude towards mobile payments which is consistent with Chandra et al. (2010); Chong et al. (2012); Curran and Meuter (2005); Khalifa and Shen (2008); and Wang and Lin (2008).</p>
Methodology	<p>Sequential mixed methods research is used with a questionnaire followed by semi-structured interviews which Saunders et al. (2012, p.167) suggest is “sequential explanatory research design”.</p> <p>The use of mixed methods for the research enquiry is valid and justified as 2 separate research instruments assist in validating the research findings (Webb et al., 2000) whilst multiple research methods produce rich and intricate data than may not have been obtained from the use of a single research instrument (Bryman, 1992; Hussey & Hussey, 1997).</p>
Mobile payment devices	<p>A broader UK consumer perspective of mobile payments is provided with different consumer enabled devices compared to previous research that focused on the mobile phone handset (Kim et al., 2010; Ondrus & Pigneur, 2005; Pousttchi, 2004; Zong, 2009).</p>

Table 5 - Theoretical and Methodological Contribution Summary

This thesis contributes to theory development of consumer behaviour, consumer purchase behaviour and technology adoption through the use of an extended TAM. Research findings are then included within the existing body of knowledge including a methodical contribution based upon sequential mixed methods. However, mobile payments is an evolving phenomenon (Diniz et al., 2011) and, as a result, the existing theoretical and methodological body of knowledge on this phenomenon continues to emerge. In addition, this research has implications for the theoretical understanding of how consumers currently assess the evolving mobile payments phenomenon.

The TAM has been widely used to assess technology adoption in both a consumer and a business environment (Yousafzai et al., 2007) although the TAM was originally developed to assess technology adoption in a business environment. As a result, the TAM's key constructs do not reflect the various tasks that are found in a consumer determined technology environment. Whilst the original TAM is easy to apply in different environments with predictive results it does not provide sufficient depth of understanding of the drivers of consumer behaviour that lead to adoption without the inclusion of additional constructs (Mathieson, 1991). The original TAM developed by Davis (1989) is extended into an enhanced conceptual model through the addition of trust and risk constructs which adds to the theoretical assessment of UK consumer perceptions of mobile payments. This research offers empirical evidence of UK consumer perceptions of mobile payments.

Perceived usefulness is identified as a very important influence on UK consumer interest in mobile payments which is consistent with previous research (Chen, 2008; Dahlberg et al., 2008; Koenig-Lewis et al., 2010; Luarn & Lin, 2005; Wu & Wang, 2005). However, perceived ease of use is no longer influential for UK consumer interest in mobile payments which is inconsistent with previous research (Amirkhani et al., 2011; Luarn & Lin, 2005; Meuter et al., 2003; Saaksjarvi, 2003). Furthermore, perceived risk negatively affects perceived usefulness of mobile payments whilst perceived trust offsets risk and positively affects perceived usefulness which is consistent with Zhou (2014).

Previous mobile payment research used a predominance of quantitative methods of assessment (Amoroso & Magnier-Watanabe, 2012; Arvidsson, 2014; Liebana-Cabanillas et al., 2014; Rouibah, 2009; Shin, 2009; Shin et al., 2014; Swilley, 2010). This research extends the application of theory through the use of sequential mixed method research (Saunders et al., 2012). A questionnaire is used as the 1st research instrument that produces quantitative data. The questionnaire findings are used to focus the subsequent semi-structured interviews that produce qualitative data which is “sequential explanatory research design” according to Saunders et al. (2012, p.167). The use of two separate research instruments produces rich and intricate data that may not have been obtained from the use of a single research instrument (Bryman, 1992; Hussey & Hussey, 1997).

The use of sequential mixed methods provides a new theoretical perspective for exploring UK consumer perceptions of mobile payments compared to the predominant use of quantitative methods in previous research using TAM and derivatives according to Yousafzai et al. (2007). The use of multiple research methods is a valuable approach to exploring consumer perspectives of the mobile payments phenomenon as the semi-structured interviews provide the opportunity to explore in depth the key findings that were identified from the questionnaire.

Assessment of mobile payment adoption has historically been based upon the mobile phone as the consumer device. However, this research refines and extends mobile payments into other consumer orientated technology devices that include smart phones and contactless smart cards although other payment devices now include tablet computers, watches and glasses (Apple, 2014a; Google, 2014; Little, 2011; Samsung, 2014; Swatch, 2015) based upon the European Commission (2012) and the European Payments Council (2012) mobile payments definition. Previous theoretical approaches used in mobile payments research need to be revisited and revised as these were based upon the mobile phone handset whereas consumer orientated payment technology and the mobile payments phenomenon have continued to evolve. A broader UK consumer perspective of mobile payments is provided with different consumer enabled devices compared to previous research that predominantly focused on the mobile phone.

Whilst theoretical research has been undertaken on contactless cards as a payment device this has generally not been undertaken as part of mobile payments theory (Carter, 2005; Englund & Turesson, 2012; Noe, 2005; Polasik et al., 2012; Wang & Lin, 2008). The continued development of consumer orientated mobile technology devices that support mobile payments (Apple, 2014a; Google, 2014; Samsung, 2014; Swatch, 2015) requires a re-assessment of previous theoretical research and a re-evaluation of previous research findings on consumer technology adoption and mobile payment adoption.

Existing mobile payment theory is based upon the mobile phone device but this can be effectively used to explore UK consumer perceptions of mobile payments based upon different consumer mobile devices which extends the understanding of consumer electronic payment behaviour. The application of existing consumer purchase behaviour theory, technology adoption theory and mobile payment theory to UK consumer perspectives of mobile payments provides an insight into UK consumer purchase behaviour.

8.7 Limitations of this Research

There are a number of limitations that apply to this research including the use of sequential mixed methods to produce empirical data, the use of a questionnaire as a research method, the use of interviews with convenience sampling as a 2nd research method, the limited amount of empirical data obtained and as a result the findings may not reflect the views of the wider UK adult population (Ritchie et al., 2003) although this was never the intention of this research.

Sequential mixed methods research is used with a questionnaire followed by semi-structured interviews that produce rich and intricate empirical data (Bryman, 1992; Hussey & Hussey, 1997). However, the findings are only valid at that moment in time as repeating the research may produce different findings based upon the consumer perspectives that may have changed in the intervening time (Becker, 1990).

The use of a questionnaire is also a limitation as the questions are determined by the researcher and the questions selected may include influences from the background

and beliefs of the researcher despite attempts to avoid any influence and bias (Rubin & Rubin, 2012; Snape & Spencer, 2003). In addition, a number of questions have pre-determined answer options using a 6 point Likert scale that is a personal judgment measuring instrument (McIver & Carmines, 1981) which is a further limitation. Furthermore, the questions asked and answer options provided may be inaccurate or incomplete (Quinlan, 2011). A further limitation of this research is the use of a restricted number of questions for each construct that is included in the conceptual model in order to encourage participants to fully complete the questionnaire as too many questions can take too long to complete which results in incomplete responses (Bordens & Abbott, 2010).

The questionnaire responses are determined by those participants prepared to complete the survey, with only 101 valid questionnaire responses received which is a further limitation despite requests to secure an increased number of responses. In addition, a number of questionnaire responses are obtained using an online survey aimed at individuals who have previously shown an interest in mobile payments through membership of a mobile payment group on LinkedIn which may be regarded as a further limitation. The questionnaire data that is obtained from these LinkedIn respondents may reflect their interest in the research topic with a resultant bias in the research population and the research data obtained (May, 2001; Rubin & Rubin, 2012), although this is mitigated through the use of other online survey social networks as well as obtaining face to face data.

Analysis of the questionnaire response data identifies that the respondent population has an increased level of education compared to the UK adult population's educational qualifications which is a further limitation of these research findings. The educational bias of the research data obtained may provide a bias in the research findings as respondents with higher education levels are more likely to be innovators or early adopters according to Rogers (2010). However other research identifies that education level has no influence on consumer attitude towards the use of a smart phone (Osman et al., 2011) and has no influence with online and mobile banking adoption (Laforet & Li, 2005; Lassar et al., 2005).

In addition, the use of a questionnaire and interviews as two research methods may produce an inherent data bias as individuals with specific characteristics or backgrounds may be more likely to respond (Miller & Brewer, 2003). Furthermore, the use of convenience interviews with 10 interviewees limits the qualitative data obtained to the selected participants which is a further limitation of this research and cannot be repeated as the perspectives of the individual interviewees may have changed in the intervening period (Becker, 1990). As a result, drawing firm conclusions from the answers to the limited number of questions in the questionnaire and the small number of interviews undertaken is also a further limitation of this research as the application of the findings cannot be applied to the wider community (Ritchie et al., 2003) although this was never the intention of this research.

The research findings are based upon a single study with research data collected in the summer of 2014 using two research methods. Response data was obtained from research participants at one general location around Chester in the UK using a face to face questionnaire although the questionnaire respondents responding electronically could be located anywhere in the UK which is a further limitation of this research. As a result the research findings cannot be applied to a wider community although this was never the intention (Ritchie, Lewis & Elam, 2003).

Finally, the new mobile payments knowledge that is created is subjectively constructed from the data that is collected including the semi-structured interviews as these are based upon a social interaction that includes bias (Rubin & Rubin, 2012). Furthermore, any analysis of the data by other researchers may produce different perspectives which may be regarded as further limitation of this research (Sarantakos, 2005).

8.8 Future Research Opportunities

This research provides a valuable assessment of UK consumer perceptions of mobile payments that can be used as a foundation for further empirical and conceptual research on this evolving phenomenon. The empirical assessment of the various research propositions within the conceptual model provides a firm basis from which to undertake future research on UK consumer perspectives of mobile payments. This

research can be repeated at a future date so that a longitudinal perspective is obtained that assesses whether UK consumer perceptions have changed through increased awareness (Mathieson et al., 2001; Venkatesh & Davis, 2000).

In addition, alternative research paradigms and methodologies can be used to explore UK consumer perspectives of the mobile payments phenomenon as this adds different assessments to the contemporary research currently available. Future research can replicate this research using an increased number of participants; with participants from different parts of the UK; with participants who have a younger age profile; and also with participants who do not hold a degree qualification. This will provide a broader representative sample that adds further credibility to these research findings. In addition, this research obtains data from participants who have previously shown an interest in mobile payments through membership of various mobile payment groups on LinkedIn. As a result, the data that is obtained may have included an inherent bias and so repeating this research with different UK respondents adds to the credibility of these research findings. Furthermore, the empirical data obtained may have specific characteristics or backgrounds including those more likely to respond to the research methods used. As a result, repeating this research in other markets with different respondents and with different methodologies provides a further opportunity to validate these findings.

Consumer perceptions of the payments market may vary within the UK and across countries with different cultures and sub-cultures (Menke & de Lussanet, 2006) whilst previous research on the mobile payments phenomenon has focussed on an Asian and Nordic countries. Future research can extend this UK consumer perspectives of mobile payments to consumers in other areas of the UK and other countries and particularly other countries where PIN authenticated payments have a similar profile to the UK.

No assessment of mobile payment consumer adoption behaviour is undertaken due to the embryonic stage of the mobile payment phenomenon in the UK, although this is not a major limitation for this research as there is substantial empirical support for the causal link between affective response and behavioural response (Taylor & Todd, 1995; Venkatesh & Davis, 2000; Venkatesh & Morris, 2000) However, as new mobile

payments become more widely adopted by UK consumers then future research can assess actual UK consumer adoption criteria based upon behaviour. This will considerably improve research reliability and will add further to the knowledge base (Arnold & Feldman, 1981; Brookhouse, Guion & Doherty, 1986).

As UK consumer adoption of mobile payment technology devices increase this will positively influence purchase behaviour through cross-technology device influence (van Hove, 2004). As a result, future opportunities may exist to evaluate the actual device type, the payment value and point of sale environment as these may well influence UK consumer payment behaviour. In addition, the various consumer technology device innovations may produce different perceptions of device suitability for mobile payments which may lead to different adoption patterns (Hong & Tam, 2006). Further research opportunities exists to explore consumer perceptions of mobile payments based upon alternative technology device types that include key fobs, watches, wristbands, payment stickers and tags (Apple, 2014b; Google, 2014; Samsung, 2014; TfL, 2014). In addition, further research opportunities exist to explore consumer perspectives of mobile payments that include the installation, setup and operation of mobile wallets on different devices.

A clearly defined and justified conceptual research model, based upon the TAM framework, is used to evaluate the various research propositions and the subsequent research findings identify that a number of these research propositions are not supported. As a result, further research opportunities exist to take the conceptual model used and to develop an alternative conceptual model that is based upon the validated research propositions whilst including further new research propositions that may better influence consumer attitude towards mobile payments. Finally, future research opportunities exist to use alternative research models to the TAM to explore UK consumer perceptions of mobile payments which will add further dimensions to the contemporary research on this evolving phenomenon.

8.9 Research Reflections

The researcher is an experienced practitioner who undertook an MBA degree programme at University of Chester and graduated with a distinction in 2011. This MBA

experience provided an enjoyable introduction to academic research and the researcher was very keen to continue on the research learning journey. As a result, the researcher commenced this thesis as a full-time student in 2012. Undertaking this thesis provided many learning opportunities related to the mobile payments phenomenon but also challenged the researcher's own opinions, and the researcher now has a much broader and deeper perspective on life and living.

A generic consumer focussed mobile payments research topic was initially selected and was followed by a review of research on this broad research topic that contextualised the existing body of consumer based knowledge. This pool of knowledge led to the identification of areas of UK consumer perspectives of mobile payments that had yet to be considered within academic circles, and from which the final research objective was selected.

The production of this thesis has provided substantial learning that transferred into knowledge and understanding of UK consumer behaviour, UK consumer payment behaviour and technology adoption and it also provided a much clearer understanding of the role of a researcher. In addition, the use of sequential mixed methods research required the researcher to interpret quantitative questionnaire data and qualitative interview data. In addition, time management and work-life balance are aspects that have continually clashed during this research and better managing this conflict is an integral part of the learning process.

At the outset of this research, the researcher felt that mobile payments would be rapidly adopted by UK consumers. Carefully following academic standards and ensuring that personal views did not compromise the research findings, the researcher now believes that widespread UK consumer adoption of mobile payments with complex technology devices is not going to occur in the immediate future. However, the researcher believes that card based contactless mobile payments will be widely adopted and contactless smart phone payments will then follow at a slower adoption pace.

This particular piece of consumer research on mobile payments is now complete although the research journey has only just begun. The interesting question for the researcher is 'What next?'

8.10 Summary

This chapter critically evaluated the effectiveness of the conceptual model and the various research propositions in addressing the research problem before suggesting how the conceptual model can be improved for future research in this area. The implications of the findings on theory and practice were then explored which was then followed by how this research contributes to the existing body of knowledge on consumer purchase behaviour and technology adoption. The identification of the theoretical & methodological contributions and the limitations of this research were then acknowledged. This was followed by the identification of the various opportunities for further research on consumer purchase behaviour and consumer perceptions of mobile payments. The chapter concluded with the researcher's reflections on the journey in producing this thesis.

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Appendix A - Research Questionnaire

Background/Introduction

My name is Chris Hampshire and I am undertaking a PhD research degree at the University of Chester on UK consumer perceptions of mobile payments. A mobile payment is defined as 'making a payment using any device or instrument with wireless technology' e.g. mobile phone, tablet computer, laptop computer and bank payment cards. I am therefore seeking your assistance in answering a short consumer research survey which should only take about 10 minutes of your time.

Research Purpose

Part of my PhD research project investigates the UK consumer perceptions of mobile payments through a consumer research questionnaire that is available for completion electronically through Facebook, through specialist mobile payment groups on LinkedIn and also through face to face interviews at Cheshire Oaks Retail Outlet.

My doctoral research explores various aspects of consumer perceptions of mobile payments related to ease of use, usefulness, trust and risk which are factors that affect a consumer's attitude to use of mobile payments. The questions asked are designed to obtain your own views and perceptions on each of these individual aspects and therefore there is no right or wrong answer. The questionnaire is confidential, no personal information will be gathered and the results will be presented in a summary form only.

Your participation is strictly voluntary although participation in this survey will enable me to include your response in my subsequent data analysis which will add to the credibility of my research findings. The research data allows me to draw conclusions on ways that organisations offering mobile payment services can improve consumer interest in this new mobile payment capability. All participants who kindly complete the questionnaire will be regarded as having provided informed consent to their data being used as described above.

Completion Instructions

If you have more than one mobile phone please provide answers based upon using your smart phone if you have one. For each question or statement please mark the appropriate box with a cross (x) which best reflects your answer as shown in the following example:

I anticipate making a mobile payment will be easy.	Strongly Agree	<input type="checkbox"/>
	Agree	<input checked="" type="checkbox"/>
	Slightly Agree	<input type="checkbox"/>
	Slightly Disagree	<input type="checkbox"/>
	Disagree	<input type="checkbox"/>
	Strongly Disagree	<input type="checkbox"/>

Thank you for your participation in this research.

Chris Hampshire

1. I find my personal computer (PC), laptop computer or tablet computer technology easy to use.

Don't have a PC, Laptop or Tablet

Strongly Agree

Agree

Slightly Agree

Slightly Disagree

Disagree

Strongly Disagree

2. I believe that learning how to make a mobile payment will be easy for me.

Strongly Agree

Agree

Slightly Agree

Slightly Disagree

Disagree

Strongly Disagree

3. I anticipate making a mobile payment will be easy.

Strongly Agree

Agree

Slightly Agree

Slightly Disagree

Disagree

Strongly Disagree

4. A mobile payment will be of interest to me if it is faster than other types of payment.

Strongly Agree

Agree

Slightly Agree

Slightly Disagree

Disagree

Strongly Disagree

5. If I have to register for a mobile payment service this would reduce my interest in mobile payments.

Yes

No

Unsure

6. I have heard of mobile wallets.

Yes

No

7. I have heard of contactless payment cards.

Yes

No

8. I have seen the following symbol in a retail store in the UK.
e.g. M&S, WH Smith or Post Office



Yes

No

9. I would find a mobile payment useful if it means avoiding queues to pay.

Strongly Agree

Agree

Slightly Agree

Slightly Disagree

Disagree

Strongly Disagree

10. I would make a mobile payment up to a specific amount of:

Please specify. _____ (£)

11. I find my mobile phone technology easy to use.

Don't have a mobile phone
Go to Q14

Strongly Agree

Agree

Slightly Agree

Slightly Disagree

Disagree

Strongly Disagree

12. I find the following facilities easy to use on my mobile phone?
(please mark all that apply).

- Phone calls
- Text
- Web browsing
- Facebook
- Twitter
- Email
- Photos
- Videos
- Music
- Wi-Fi
- Bluetooth
- GPS
- Games
- Other (please specify)

.....

13. I find a 'smart' phone easy to use.

- Yes
- No
- Unsure

14. I find internet banking easy to use.

- Yes
- No
- Do not use

15. I would trust that my personal information is safe (meaning secure and confidential) when making a mobile payment.

- Strongly Agree
- Agree
- Slightly Agree
- Slightly Disagree
- Disagree
- Strongly Disagree

16. I would trust mobile payments if a guarantee was provided that only payments made by me result in monies being taken from my account.

- Strongly Agree
- Agree
- Slightly Agree
- Slightly Disagree
- Disagree
- Strongly Disagree

17. I would trust a mobile payment service provided by a UK Bank e.g. Barclays or Royal Bank of Scotland.

- Strongly Agree
- Agree
- Slightly Agree
- Slightly Disagree
- Disagree
- Strongly Disagree

18. I would trust a mobile payment service provided by my mobile network operator e.g. Orange, Vodafone, EE or O2.

- Strongly Agree
- Agree
- Slightly Agree
- Slightly Disagree
- Disagree
- Strongly Disagree

19. I would trust a mobile payment service provided by companies other than a bank or mobile network operator e.g. PayPal or Google

- Strongly Agree
- Agree
- Slightly Agree
- Slightly Disagree
- Disagree
- Strongly Disagree

20. I believe that using a contactless card to make a payment has risks.

- Strongly Agree
- Agree
- Slightly Agree
- Slightly Disagree
- Disagree
- Strongly Disagree

21. I believe that using a mobile phone to make a payment has risks
- | | |
|-------------------|--------------------------|
| Strongly Agree | <input type="checkbox"/> |
| Agree | <input type="checkbox"/> |
| Slightly Agree | <input type="checkbox"/> |
| Slightly Disagree | <input type="checkbox"/> |
| Disagree | <input type="checkbox"/> |
| Strongly Disagree | <input type="checkbox"/> |
22. What is your gender?
- | | |
|-------------------|--------------------------|
| Male | <input type="checkbox"/> |
| Female | <input type="checkbox"/> |
| Prefer not to say | <input type="checkbox"/> |
23. How old are you?
- | | |
|-------------------|--------------------------|
| 16-24 | <input type="checkbox"/> |
| 25-34 | <input type="checkbox"/> |
| 35-44 | <input type="checkbox"/> |
| 45-54 | <input type="checkbox"/> |
| 55-64 | <input type="checkbox"/> |
| 65+ | <input type="checkbox"/> |
| Prefer not to say | <input type="checkbox"/> |
24. What is the highest level of education you have?
- | | |
|----------------------|--------------------------|
| GCSE/O levels | <input type="checkbox"/> |
| A levels | <input type="checkbox"/> |
| BA/BSc | <input type="checkbox"/> |
| Post-graduate degree | <input type="checkbox"/> |
| Prefer not to say | <input type="checkbox"/> |

Thank you for taking the time to complete this survey.

Chris Hampshire

Appendix B - Research Interview Introduction

Assessing UK consumer perspectives of mobile payments

Background/Introduction

My name is Chris Hampshire and I am undertaking a PhD research degree at the University of Chester on UK consumer perceptions of mobile payments.

A mobile payment is defined as 'making a payment using any device or instrument with wireless technology' e.g. mobile phones, tablet computer, laptop computer and bank payment cards.

Research Purpose

My doctoral research explores various aspects of UK consumer perceptions of mobile payments related to ease of use, usefulness, trust and risk which are factors that affect a consumer's attitude to use of mobile payments.

Each interview is held separately, is confidential, no personal information will be gathered and the results will be presented in a summary form only. The interviews will be recorded electronically in order that I can focus on the interview itself and I will also be able to review the interview wording and use the recording to undertake subsequent analysis.

Participation in the interview is strictly voluntary although participation in the interview process will enable me to include your response in my subsequent data analysis which will add to the credibility of my research findings. The research data collected allows me to draw conclusions on ways that organisations offering mobile payment services can improve consumer interest in this new mobile payment capability.

Assistance/Response

I am therefore hoping that you will assist me in partaking in a research interview which will take about 45 minutes of your time at a suitable date and time in May or June 2014 at a location that is suitable for you.

If you could confirm your interest in participating in an interview by responding to my email in the 1st instance that would be greatly appreciated.

All participants who kindly complete the interview will be regarded as having provided informed consent to the process outlined and to their data being used as described above.

***Thank you for any assistance you can provide with my research into UK
consumer perspectives of mobile payments.***

Chris

Appendix C - Semi-structured Interview Guide

Stage 1 – Introductions/Context

Good Morning/Afternoon/Evening (Name)

Background/Introduction

My name is Chris Hampshire and I am undertaking a PhD research degree at the University of Chester on UK consumer perceptions of mobile payments.

A mobile payment is defined as 'making a payment using any device or instrument with wireless technology' e.g. mobile phones, tablet computer, laptop computer and bank payment cards.

Research Purpose

My doctoral research explores various aspects of UK consumer perceptions of mobile payments related to ease of use, usefulness, trust and risk which are factors that affect a consumer's attitude to use of mobile payments.

Each interview is held separately, is confidential, no personal information will be gathered and the results will be presented in a summary form only. The interviews will be recorded electronically in order that I can focus on the interview itself and I will also be able to review the interview wording and use the recording to undertake subsequent analysis.

Participation in the interview is strictly voluntary although participation in the interview process will enable me to include your response in my subsequent data analysis which will add to the credibility of my research findings. The research data collected allows me to draw conclusions on ways that organisations offering mobile payment services can improve consumer interest in this new mobile payment capability.

Assistance/Response

Your assistance in partaking in this research interview will take about 45 minutes of your time although you can stop the interview at any time.

All participants who kindly complete an interview will be regarded as having provided informed consent to the process outlined and to their data being used as described above.

Stage 2 – Demographic background

Please could you indicate which of the following applies to you?

Gender

- Male
- Female

Age

- 16-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65+
- Prefer not to say.

Education

- GCSE/O levels
- A levels
- BA/BSc
- Post-graduate degree
- Prefer not to say.

Do you use Internet banking? If so do you find it easy to use?

Stage 3 – Mobile Payments Investigation

General areas for exploration

- ❖ General technology ease of use e.g. PC/Tablet/DVD/Other devices.
- ❖ Mobile phone/smart phone ease of use.
- ❖ Smart phone usage - number of mobile apps used on the phone.

Specific mobile payment areas for exploration

- ❖ Perceived usefulness.
- ❖ Perceived ease of use.
- ❖ Perceived trust:
 - Safety of personal information.
 - Impact of any payment guarantee.
 - Different types of payment organisations.
- ❖ Perceived risk:
 - Financial.
 - Data/Security.
 - Devices e.g. contactless cards, mobile phones and other device types.
- ❖ Mobile payment registration.
- ❖ Payment guarantees (e.g. DD guarantee scheme)
- ❖ Upper transaction limit.

Stage 4 – Wrap-up.

Any questions or concerns?

Thank you for your time. Finished recording now. (Switch off).