

FinTech Acceptance Research in Finland - Case Company Plastic

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Abstract

This research was designed to explore the major factors affecting the acceptance of the all-in-one payment method (Placst Card) in Finland. The primary purpose was to find out possible variables which affect users' adoption rate in terms of the unique features of FinTech products, the second purpose was to propose a conceptual research model based on consumer acceptance theories from information system field, and the third purpose was to provide practical suggestions for the case company Placst and similar FinTech start-ups according to the research results.

Four principal theoretical models well-aligned to the special characteristics of FinTech were elaborated and employed: Technology Acceptance Model (TAM), Motivational Model (MM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and Adoption of Risky Technologies (ART). Based on the theoretical models and the relevant studies conducted in Finland, nine possible variables were chosen to examine the relationships with users' behaviour intention and a conceptual research model was proposed. In order to provide practical suggestions for the case company Placst and FinTech start-ups, the research framework was built in three different contexts: 1) Technological context, refers to the characteristics of the technology itself, focuses on the inherent features of the product or service, includes Perceived Usefulness, Perceived Ease of Use, and Price Value. 2) Individual context, individual users are grouped into different customer segments with the variables of Personal Innovativeness, Social Influence and Perceived Need of Minimalism. 3) Motivational context, focuses on the incentives of users' behaviour intention that can stimulate users' adoption intention. Variables are Perceived Enjoyments, Security Concerns, and Perceived Information.

Based on the proposed conceptual model, a questionnaire was developed to investigate the hypothetical relationships between the latent variables. A sample data of 117 respondents from Finland was collected. The statistical techniques Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were used to evaluate the measurement model, and Structural Equation Model (SEM) was employed to measure the structure model and test the hypotheses. The results further validated many variables in a new domain (FinTech) and supported the past studies that Personal Innovativeness, Perceived Enjoyment, Security Concerns, Perceived Usefulness, and Price Value have a direct influence on users' behavior intention. Results of other variables: 1) Perceived Enjoyment mainly affected the decision to start the use and Perceived Usefulness mainly affected the decision for how long will users actually use it. 2) The new variable Perceived Need of Minimalism was found to have a positive effect on Perceived Enjoyment and hence indirectly influenced the behavior intention. 3) The amount of information didn't show significant influence on behavior intention, instead, the more information the users attained, the fewer security concerns will they feel. As such, the information played an indirect role in affecting users' intentions by affecting security concerns. 4) With gained experience, the impact of Perceived Ease of Use and Social Influence tended to be weaker than in the initial stage.

Keywords FinTech, Technology Acceptance, Placst Card, All-in-One Payments

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1 Introduction

This chapter will firstly describe the background and motivation of the research, then discuss the research objectives. Furthermore, the research methods and the case company will be introduced.

1.1 Background and Motivation

FinTech is short for finance technology, it is defined as an economic industry composed of companies which use technology to achieve the more efficient financial systems (McAuley, 2015). Generally speaking, it refers to companies providing financial services by using software or mobile applications. There are a variety of FinTech types which include money transfer, equity funding, P2P lending, mobile payments, trading platforms, and other FinTech subsectors (Kantox, 2016). FinTech has gained increasing attention in the worldwide and become more and more prominent in recent years. According to Accenture report 2014, global FinTech investment has been largely increased in the recent five years, during which it remarkably jumped from less than \$1 billion in 2008 to almost \$3 billion in 2013, furthermore, it is expected that the investment will continuously grow in the following years and reach an estimated \$8 billion globally by 2018 (Gach & Gotsch, 2014). In Europe, \$1.5 billion was invested in FinTech companies in 2014 with \$539 million went to London-based companies, \$306 million to Amsterdam-based companies, and \$266 million to Stockholm-based companies (James, Ingram, Källstrand, & Teigland, 2015).

As opposed to the enthusiasm and optimism from the investors, much research indicated that the global markets remain relatively calm and cautious. EY, the Global Financial Services Institute, conducted a survey among 10,131 digitally active consumers from Australia, Canada, Hong Kong, Singapore, the U.K., and U.S and they concluded that only a weighted average of 15.5% of respondents were FinTech users (Gulamhuseinwala, Bull, & Lewis, 2015). Some researchers hold the opinion that, FinTech is the diffusion innovation that would inevitably change the world despite of the current low adoption rates, it has just got started (Munch, 2015). As such, it was the best of time, since it is teeming with all kinds of booming FinTech products which can be extremely beneficial to the customers; it was the worst of time, since the corresponding unknown challenges can bring the unmanageable and subversive consequences to both customers and the service providers.

Curiously speaking, what are the major factors impeding the progress of FinTech diffusion and affecting the acceptance of the customers?

It might be too broad to get a specific answer. In order to narrow down the scope, mobile payment, the most well-known FinTech, seems to be a suitable representative of FinTech to explore the answers in this research. It is widely accepted that, modern technology is aimed at making life more convenient and enjoyable (Osratf, 2014), the development of payment methods has perfectly convinced this assertion. Over the past three decades, the payment revolution started from cash to smart card, and from smart card to mobile payments, every single conversion was considered a significant breakthrough. While not all emerged innovation technologies are guaranteed to be popularized, it is strongly restricted by the level of acceptance from the target users. Mobile payment was first trialled in Finland and eventually got the worldwide awareness (Ayesha, 2009), whereas it develops relatively slowly in Finland. According to statistics, the developing regions usually have a high level of mobile penetration, yet due to the lack of mobile payment technology the average mobile transaction value tend to be quite low (Keira & Payvision, 2015). The foremost obstacles preventing users' acceptance of mobile payment solutions were summed up in the security and privacy risks issues (Goeke & Pousttchi, 2010), lack of consumer awareness and education (Hayashi, 2012; Kim, Mirusmonoy, Lee, 2010), and attractiveness of alternatives (Hayashi, 2012; Amoroso & Watanabe, 2012). Equivalently, it is indispensable to take into consideration of the merchants' attitude, since the one of the primary prerequisites of mobile payments is the fully equipped merchants.

Nevertheless, is there any other transition method, which not only provides the convenience of digital wallet, but also makes users the least panic about the uncertain and insecure from the new payment solution?

The invention of all-in-one payment technology could be a response to such requests. It is a technology to replace most of the smart cards with one E-ink card. It works by pairing with an app on the smartphone via Bluetooth, which provides unlimited storage for all card uses. Acts as digital wallet in a secure way, the E-ink card can be regarded as a viable bridge between card-based and wholly digital technologies. In consequence, the scope attains another reduction and is switched to the all-in-one payment technology. Plastic Card was chosen to be the case company for this research, more information of the company and the technology will be

elaborated in the following section. Therefore, the initial curiosity has been minimized to explore the major factors impeding the acceptance of Plastic Card.

In terms of this topic, Finland is the place with high research value embodied in many aspects. To begin with, Finland is the pioneer in mobile industry and alternative payments. Various attempts have been made to capitalize on the rapid development of mobile payments, and hence the country is not just familiar with this emerging technology but also keen on exploring new ways of alternative payments. In April 2014, the Finnish telecommunications company Elisa and store chain R-Kioski started to employ the pre-loaded Near-Field Communication (NFC) payment stickers (Clark, 2014). Besides, many banks began to provide mobile payment services. For instance, Finland's largest financial services group OP has successfully launched Pivo wallet with the downloading amount reached more than 500,000 times (Boden, 2015).

Furthermore, the large amount of contactless card users offers an immense potential for the acceptance of all-in-one payment solution. A payment habit research conducted in March 2015 among 4000 consumers manifested that contactless card is the dominant method in Finland (Anders, 2015). According to World Report 2015, Finland leads the way of non-cash transactions on an individual consumer basis (Capgemini, 2015). It is reported that there were 2 million contactless cards in Finland by the end of 2014, and the amount is predicted to reach 7.9 million by 2019 with the annual growth rate of 24.24% (Research and Markets, 2016).

In addition, as mentioned earlier, mobile payments was first trialled in Finland and eventually got worldwide awareness. Despite of the gradually increased attention in recent years from service providers, Finland is not the place with the high pace in accepting mobile payments from users' point of view. Contrarily, the developing regions usually have a high level of mobile penetration (Keira et al., 2015). With good timing, favorable growth environment and well-educated user base, Finland's slow and stagnant attitude in accepting mobile payments will be of interests and references.

Last but not least, since the users' acceptance theories were proposed, researchers have conducted surveys in America through the ages. Finland, on one hand, is found to be similar with the USA in many aspects: both have small power distances but differ in individualism (Hofstede, 1984). On the other hand, Finland can be regarded as a representative for The Scandinavian countries (Denmark, Finland, Norway and Sweden). Thus, Finland is well worth the investigation and discussion regarding to this topic.

1.2 Research Objectives

This research is aimed at exploring the main factors affecting FinTech diffusion. Since FinTech is a broad concept and just got started to attain social awareness, typical case company is adopted to conduct the study. Summarized from the first section, the research question was initially set to be:

What are the major factors impeding the progress of FinTech diffusion and affecting the acceptance of the customers?

To narrow down the scope, mobile payment was chosen to represent FinTech to explore the answers afterwards. Considering the foremost obstacles preventing users' acceptance of mobile payment solutions have been well summarized by many researchers, a transitional solution, all-in-one payment technology was proposed to be the new study object. Plastic Card, works as a convenient digital wallet, is an outstanding example of all-in-one payment. In the meanwhile, Finland is chosen to be the research place. Therefore, the final research question it reduced and restricted to:

Why do individuals decide to use or not to use Plastic Card in Finland?

A structural and systematic study was designed to explore the major factors affecting the acceptance of Plastic Card in Finland. The primary purpose is to find out the possible variables which affect users' adoption rate in terms of the unique features of FinTech products and the second purpose is to propose a conceptual research model based on consumer acceptance theories from information system field. Four principal theoretical models, which are well-aligned to the special characteristics of FinTech: The Technology Acceptance Model (TAM), Motivational Model (MM) the Unified Theory of Acceptance and Use of Technology (UTAUT), and Adoption of Risky Technologies (ART), will be used to develop the research model and build the relevant hypothetical relationship among variables.

The third purpose is to provide practical suggestions for the case company Plastic and similar FinTech start-ups according to the research results. Variables are divided into three different contexts: Technological context, Motivational context and Individual context, as such, suggestions are corresponding to three different aspects, suggestions based on the technology itself, suggestions towards promotion and publicity, and suggestions to seek for target consumers.

1.3 Research Methods

The empirical framework consists of three steps. Based on the proposed conceptual model, the first step is to design a survey with questions setting in accordance with constructs. A Likert 7-point scale was applied for each question with “1 = Strongly disagree”, “2= Disagree”, “3 = Somewhat disagree”, “4= Neither agree or disagree”, “5 = Somewhat agree”, “6 = Agree”, “7 = Strongly agree” except for the demographic variables.

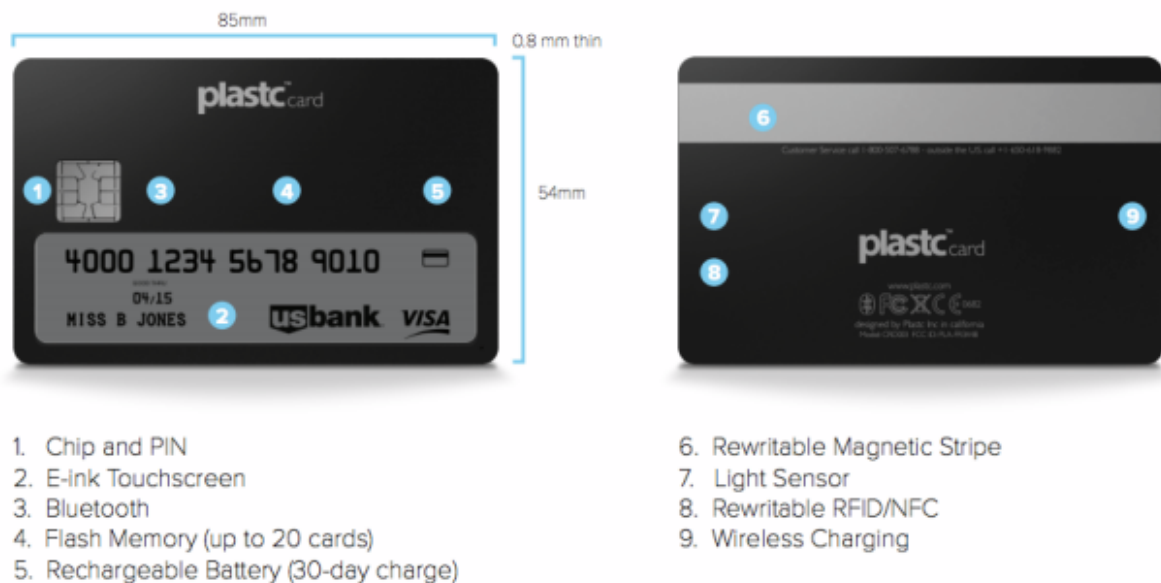
The next step is to collect the data. Finland was chosen as the research place for various reasons which have been explained in the first section, hence all the respondents were either Finnish or currently live in Finland. The questionnaire was accessed through a website link with all the questions set as compulsory to answer. 230 invitations to the link were sent to Facebook friends and returned 122, which reached a response rate of 53%. Among the 122 responses, 5 of them was uncompleted, thus 117 were used for data analysis.

The third step is to analyse the collected data. Both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were utilized to analyse the measurement model with EFA to enhance the exploration the factors and CFA to enable confirmation the factor structure. Although many of the constructs adopted in the conceptual model have been validated in earlier research, it is necessary to do the reliability and validity measurements with both EFA and CFA. FinTech and Plastic Card both are new and novel topics to be studied under the acceptance model and some of the constructs are not widely studied. Consequently, both EFA and CFA were employed in the process of data analysis. Structural Equation Model (SEM) was conducted to measure the structural model afterwards since SEM helps access the constructs and test the proposed theoretical relationships in a unified and integrated manner (Gurski, 2014). By checking the goodness of fit indices for the full structural model, both measurement model and structural model were adjusted to reach a superior empirical result, and then the hypothetical relationships between variables were examined as the last step in data analysis.

1.4 Case Company

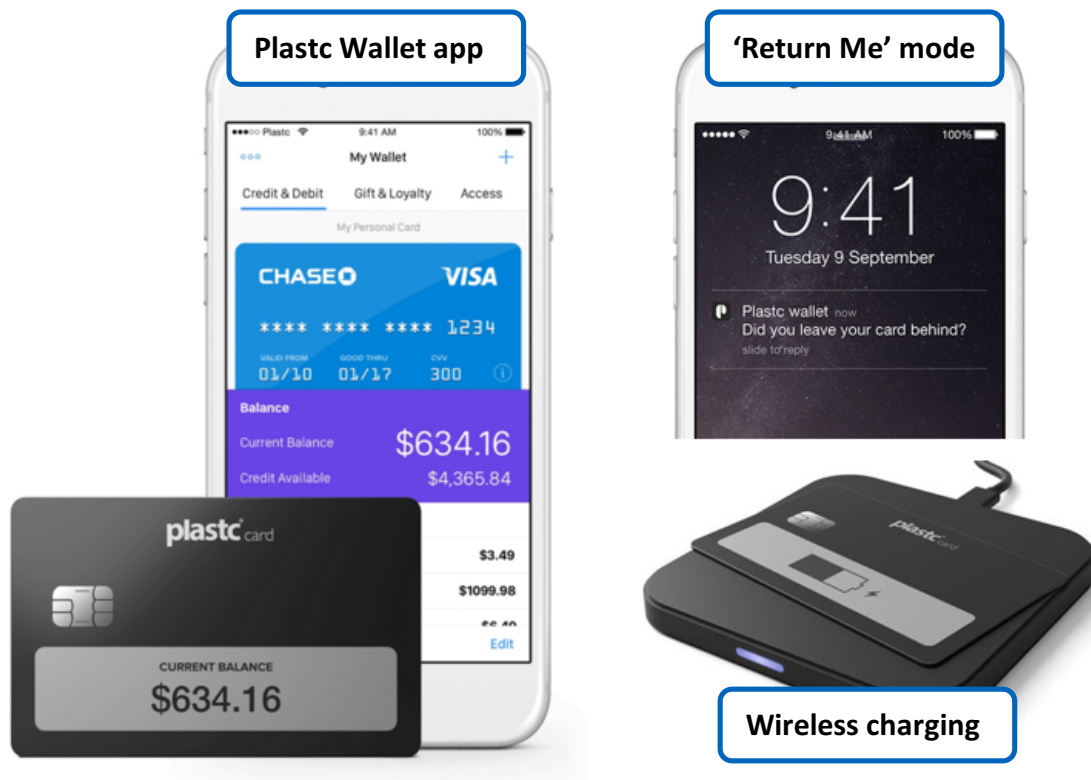
Plastic (www.plastic.com) was founded in 2013 in San Francisco, California. It is a FinTech company providing the “*intelligently designed, full featured, and secure*” all-in-one payment devices and services. Combined with the Plastic Wallet app, Plastic Card is used to store credit, debit, gift, loyalty, membership, and key cards on a single device. Each Plastic Card has its specific secure PIN lock to act as the alerts in a unique ‘Return Me’ mode and hence it is asserted to be more secure than the traditional cards in everyday use. The e-ink card has not been released yet but pre-order is provided.

Figure 1 Features and Specifications of Plastic Card (Shieber, 2014)



The main features and specifications are shown in Figure 1 and the functionalities is demonstrated in Figure 2. Plastic Card is an all-in-one solution which allows to store up to 20 smart cards into one sophisticated device. The E-ink screen is used to unlock the device, display the details of the selected card, and swipe between different cards. The Chip and PIN equip the Plastic Card with equal facility as traditional card, therefore, it is not necessary for merchants to additionally add another payment equipment. Plastic Card is connected with Plastic Wallet app through Bluetooth, thus all the information inputting in the app will be added, managed and synced automatically into the Plastic Card. In the meanwhile, Plastic Card is set to immediately delete all the data in store once it gets lost and syncs back all the data by connecting with the matched phone when it gets back. Besides, the battery is chargeable and able to last for 30 days. (See **Figure 1** & **Figure 2**)

Figure 2 Functionalities of Plastic Card (Source: www.plastic.com)



It is introduced in the website that, the price of pre-order is \$155, which comes with a free subscription and two-year warranty. However, after pre-order the retail price will be increased to \$180 together with an 18 month subscription and the ongoing service fee for \$50 per year.

On account of these the innovative features and intelligent functionalities, many prestigious tech media have published all kinds of positive reviews. Hamburger (2014) concluded in The Verge that Plastic Card enables users to utilize the main payment system in a more smart way. Likewise, Shieber (2014) reported in TechCrunch that Plastic seems to exceed its competitors and hopefully to be a viable bridge between traditional card and completely digital technologies, and Moon (2014) described in Engadget that Plastic might ahead in the market since it is embedded with a computer chip which is difficult to clone. Plastic was chosen as the case company for this research partly because of its strong representative image of mobile payments and FinTech, and partly for the reason that the card is not yet released. Now that Plastic is in its early stages, it accords with the context of acceptance theories in information system fields and suitable for being the research case company.

1.5 Structure of the Thesis

The main themes of this study are firstly to find out the possible variables which affect users' adoption rate in terms of the unique features of FinTech products, secondly to propose a conceptual research model based on consumer acceptance theories from information system field, and thirdly to provide practical suggestions for the case company Plaste and similar FinTech start-ups according to the research results. More specifically:

Chapter 1 introduces the background and motivation to conduct the research, defines the research objectives and research methods, and elaborates the information of case company.

Chapter 2 is mainly concerned with the four prominent theoretical models by which different sets of acceptance determinants are described, shows how the models get developed and extended, and develops the conceptual model for this research.

Chapter 3 builds an empirical framework for analysing the collected data based on the proposed conceptual model from chapter 2, explains the research approaches and the primary methods such as EFA, CFA and SEM.

Chapter 4 applies EFA to explore the actual correlations among items, utilizes CFA to assess the measurement model, and employs SEM to estimate the structural model and examine the hypothetical relationships between the latent variables.

Chapter 5 starts with the discussion of empirical results and findings from the feedback of questionnaires, thereafter, theoretical contribution is clarified and practical implications is presented and then limitations and suggestions for further Research are concluded to finalize the research.

1.6 Definitions

FinTech:

Finance Technology, an economic industry composed of companies which use technology to achieve the more efficient financial systems. (McAuley, 2015)

P2P lending:

Peer-to-peer lending, online services that match lenders with borrowers via direct, one-to-one contracts from one or multiple providers to a single recipient. (Moeninghoff& Wieandt, 2012)

Mobile Payment:

Cashless payment solution that money can be transferred through a portable contactless devices such as cell phone, a smartphone or other intelligent wireless devices, it is used in restaurants or any other stores, if the merchants are fully equipped. (Ghiciuc, 2016)

E-ink:

Known as Electrophoretic or Electronic Ink, it is a straightforward fusion of chemistry, physics and electronics, it utilizes the same pigments used in the printing industry today thus it has the same appearance as paper. (E-Ink.com)

NFC:

Near field communication (NFC), a set of communication protocols, it enables two electronic devices to establish communication by the close encounter, usually one is a portable device such as a smartphone and the other is merchants' receptor. (Faulkner, 2015)

RFID:

Radio-frequency identification (RFID), refers to small electronic devices with tiny chip and an antenna which is capable of carrying 2,000 bytes of data or less. It works similar as a bar code or a magnetic strip and provides a unique identifier for each card but more useful than barcodes. (technovelgy.com)

EMV:

Europay, MasterCard and Visa, it is the global standard for cards with computer chips inside to authenticate chip-card transactions. (Kossman, 2016)

2 Literature Review

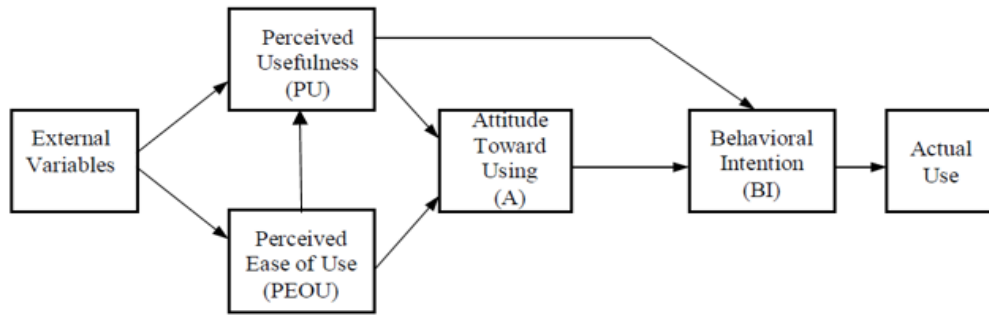
This chapter introduces four prominent theoretical models by which different sets of acceptance determinants are described, shows how these models get developed and extended, and discusses the contributions and restrictions of each model. Many theories have been proposed to explain user acceptance of new technology in the contemporary information system literature. Despite of the wide variety of such theories, this research will mainly focus on four principal theoretical models which are well-aligned to the special characteristics of FinTech: Technology Acceptance Model (TAM), Motivational Model (MM) the Unified Theory of Acceptance and Use of Technology (UTAUT), and Adoption of Risky Technologies (ART). Based on reviewed theoretical models, the research model will be built and the relevant hypotheses will be proposed.

2.1 Technology Acceptance Model (TAM)

Below are examples of a table and figure. Note how the table caption is above the table, while the figure caption is below the table. Due to the high failure rate in new products during the past two decades, many models have been developed to explain and predict the adoption of a system or innovation, among which Technology Acceptance Model (TAM) has undoubtedly captured the most attention of the information systems community (Chuttur 2009). Initially proposed by Davis (1989), TAM was designed to explain the user acceptance of computer-based information systems, and then got widely applied and adapted to a diverse set of technology research (Venkatesh et al., 2003). In particular, TAM has been largely involved to predict FinTech adoption, such as mobile payments (Wu & Wang, 2005; Zhong, Dhir, Nieminen, Matti, Laine, 2013), e-tickets (Mallat, Rossi, Tuunainen, Öörni, 2009), e-commerce (Smith, Synowka, Smith, 2014) and so on.

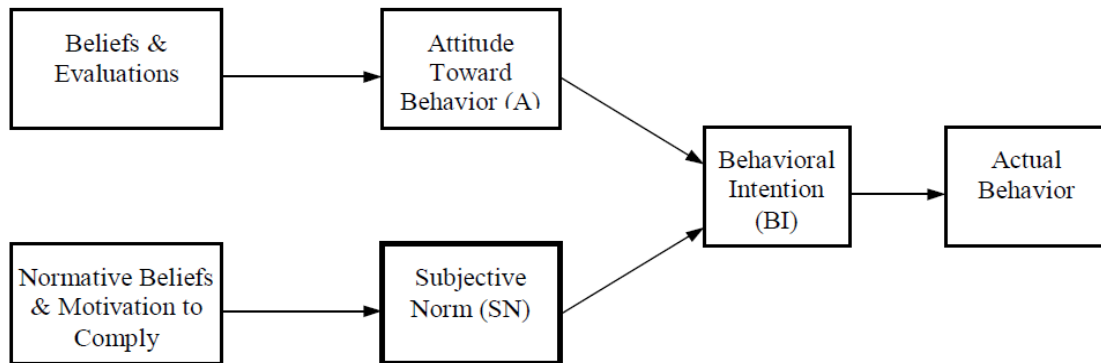
According to TAM, users' adoption of information technology is determined by two particular constructs: perceived usefulness and perceived ease of use (Davis, 1989). Perceived usefulness is defined as *"the degree to which a person believes that using a particular system will enhance the job performance"*, and perceived ease of use is defined as *"the degree to which a person believes that using the system would be free of effort"* (Davis, 1989). TAM states that perceived usefulness affects user's behavioural intention directly, while perceived ease of use affects behavioural intention indirectly through perceived usefulness (See **Figure 3**).

Figure 3 Technology Acceptance Model (Davis, 1989)



TAM is an influential extension of the Theory of Reasoned Action (TRA), which is one of the most fundamental theories in human behaviour. TRA was formulated to provide consistency in studies of the relationship between behaviour and attitudes. The core instructions are shown below, individuals’ behaviour intention determines the actual behaviour, and it is in turn determined by the attitude towards behaviour together with subjective norm. (Ajzen & Fishbein, 1980) (See **Figure 4**)

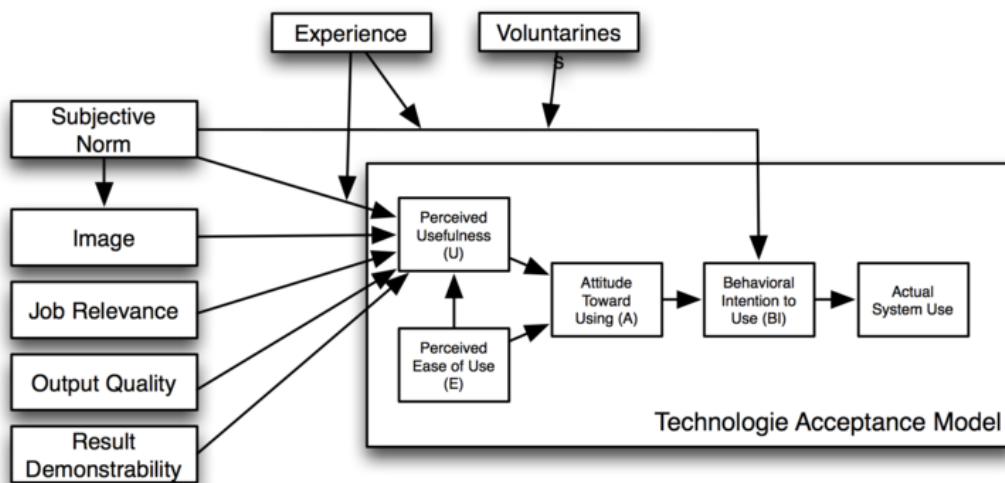
Figure 4 The Theory of Reasoned Action (Ajzen & Fishbein, 1980)



Originates from social psychology, TRA was based on the assumptions that individuals are rational, and they take the consequences of the possible actions into account before the decision-making phase (Ajzen et al., 1980). Hence, limitations of TRA can be described as the factors influencing the ration and the decision-making habits of individuals: unconscious motives, personality, and demographic (Armitage & Conner, 2001). Both TRA and TAM postulates that, individuals’ actual behaviour is mainly determined by the behaviour intention. However, as a general model, TRA does not specify the operative beliefs for a particular behaviour, TAM closes this gap by indicating the impact of external factors on internal beliefs, attitudes, and intentions (Davis, 1989). Furthermore, the other difference between

TRA and TAM is that, all beliefs are summed together in TRA, but different beliefs are regarded as distinct constructs in TAM (Pikkarainen, Pikkarainen, Karjaluoto, & Pahnla, 2004). Davis, Bagozzi and Warshaw (1989) conducted a longitudinal research with 107 users to measure their intention to use a system and concluded that ease of use is clearly of importance but usefulness is even more important, therefore, the resultant model is certain as TAM (Davis, 1989). Continuously adaptations have been trialled since 1989. In 2000, Venkatesh and Davis proposed TAM 2 after the field study with 156 knowledge workers, who used four different systems, two for voluntary use and two were mandatory. The result explained the user intention in a more detailed way, compared to TAM, TAM2 added additional variables as antecedents to perceived usefulness: Image, Job Relevance, output quality, and result demonstrability (Venkatesh et al., 2000).

Figure 5 Technology Acceptance Model 2 (Venkatesh et al., 2000)



Despite of the wide citation in information system research, TAM has been criticized for its questionable heuristic methodology, limited explanatory capacity, and lack of practical value (Chuttur, 2009). It is suggested by many researchers that, to increase the power of prediction, TAM should be integrated into a broader model which includes organizational and social factors (Legris, Ingham, Colletette, 2003). According to Legris et al. (2003), TAM and TAM2 together can account for 40% of a technological system's use. Nevertheless, the two variables, perceived ease of use and perceived usefulness, are regarded as the most core factors in explaining system use, and will continuous be studied and developed in the field.

2.2 Motivational Model (MM)

There are a number of researchers in psychology attempting to explain human behaviour through motivation theory. Proposed by Deci and Ryan in 1985, Self-Determination Theory (SDT) is one of the most well-known approaches. In SDT (Deci & Ryan, 1985), based on a diversity of reasons or goals that lead to an action, motivation can be distinguished into two types: the intrinsic motivation, which refers to “*doing something because it is inherently interesting or enjoyable*”, and extrinsic motivation, which refers to “*doing something because it leads to a separable outcome*” (Deci & Ryan, 1985). Vallerand (1997) presented a fundamental model of motivation asserting that different motivational types are influenced by social factors, and predicted that the different types of motivation will lead to important cognitive, affective, and behavioural consequences (Vallerand, 1997).

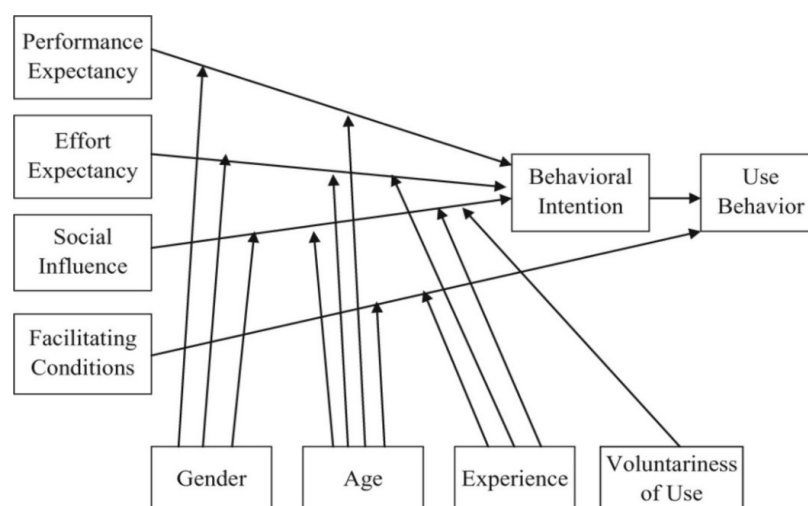
Davis, Bagozzi and Warshaw (1992) adapted the motivational model to explain the use of computers in workplace, since then, a stream of information system domain started to apply motivational model to explore factors affecting new technology adoption. In their research, Davis, et al. (1992) examined two motivators: perceived usefulness, an example of extrinsic motivation, and perceived enjoyment, an example of intrinsic motivation. They concluded that the two factors had significant effect on the use intention. Igbaria, Iivari and Maragahh (1996) conducted a survey based on the two interrelated motivators among 450 IS managers in Finland about the computer use in technology, the result implied that perceived usefulness plays a stronger role than perceived enjoyment in affecting users’ intention. Teo, Lim and Lai’s (1998) research in internet use in Singapore examined the three motivators, perceived usefulness, perceived enjoyment and perceived ease of use. Their results turned to be consistent with the previous research carried out in Finland. As such, much of the research has been concerned with the extrinsic motivation and inadequate attention has been paid to intrinsic motivation (Fagan, Neill & Wooldridge, 2008). However, Yoo, Han and Huang’s (2012) research indicated that, intrinsic motivation directly impacts behavioural intention while extrinsic motivation shows no direct impact on behavioural intention on the e-learning in the workplace in South Korea. These comparisons suggest that, culture differences and the type of technology should also be taken into considerations when applying the motivational model in information system domain. In the meanwhile, Motivational model can be regarded as another typical example transited from the psychology theories, which gets widely adopted in IS use as well as the theory of reasoned action (TRA).

2.3 Unified Theory of Acceptance and Use of Technology (UTAUT)

After empirically reviewing and comparing the 8 most important models, Venkatesh et al. formulated a new model named Unified Theory of Acceptance and Use of Technology (UTAUT) with four core determinants of intention and four moderators of key relationships (Venkatesh et al., 2003). The 8 models are as follows, the Theory of Reasoned Action (Ajzen et al., 1980), the Technology Acceptance Model (Davis, 1989), the Motivational Model (Davis, et al., 1992; Venkatesh & Speier, 1999), the Theory of Planned Behaviour (Ajzen, 1991), the combined TAM and the Theory of Planned Behaviour (Taylor and Todd, 1995), the Model of PC Utilization (Thompson, Higgins & Howell, 1991), the Innovation Diffusion Theory (Rogers, 1995) and the Social Cognitive Theory (Bandura, 1986).

It is manifested in **Figure 6** that, four constructs were theorized to directly affect the user acceptance and usage behaviour: performance expectancy, effort expectancy, social influence, and facilitating conditions. In the meanwhile, gender, age, experience and voluntariness are defined as moderators. The UTAUT is a definitive model formulated by the leading researchers in technology acceptance domain, it advances cumulative theories by unifying the perspectives to account for dynamic influences such as organizational context, user experience and demographic characteristics (Qeisi & Abdallah, 2013). UTAUT is claimed to account for 70 percent of the variance in usage intention (Venkatesh et al., 2003). However, Bagozzi (2007) critiqued that 41 independent variables for predicting intentions and 8 independent variables for predicting behaviour led the situation into chaos, let alone the abandon of other important independent variables, which narrows the representative ability to specific technologies.

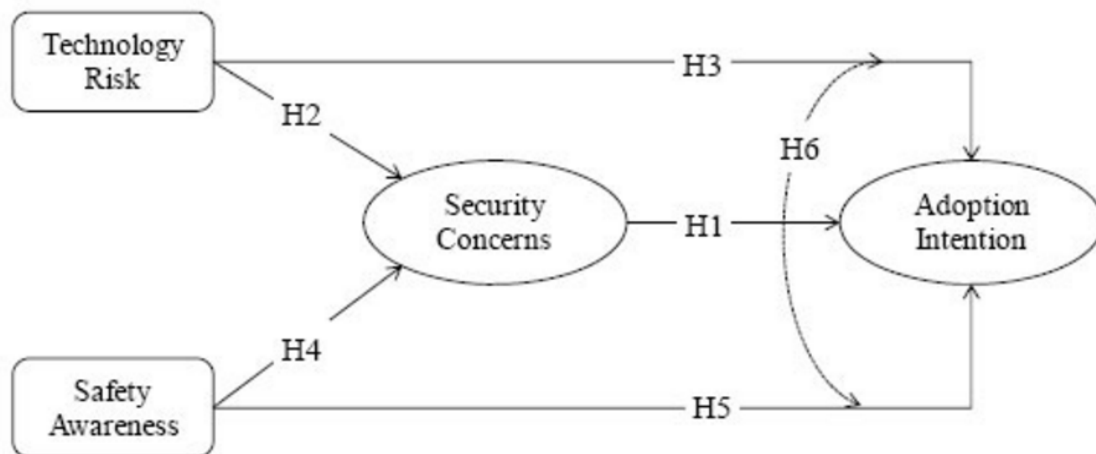
Figure 6 Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003)



2.4 Risky Technology Adoption Models (RTA)

Security issues have been widely discussed when it comes to the adoption of risky technologies such as electronic commerce, mobile payments, and mobile banking, however, seldom paid attention to risk related concerns. Focusing on mobile banking as a risky technology, Gupta and Xu (2010) proposed the research mainly on risk and control factors of user adoption. They concluded on their research model that, technology risk and safety awareness both directly affect the security concerns and the adoption of intention, as such, security concerns itself also affects adoption intention directly, in the meanwhile, the effect of safety awareness is stronger than technology risk on adoption attention. Their research results implied that, risk and control both play significant roles in technology adoption, furthermore, control shows stronger influence on user intention. And hence, they recommended vendors and service providers from risky technologies to emphasize the control issues in the advertisement and focus on user instructions and guidelines in order to increase the rate of adoption when launching new technology based products and services.

Figure 7 Risky Technology Adoption Models (Gupta et al., 2010)



Due to the limitation of times, technologies studied on users' adoption were usually non-financial related, risk and control were not considered the major factors in many past studies. Gupta et al. (2010) verified that the inherent risks of most financial technologies impair the users' adoption, and that the perception of control effects more than the perception of risks to customers. On the one hand, their research clarified the differences between risk and security issues, filled the gap in literatures, and provided practical guidelines for future risky technologies studies. But on the other hand, privacy considerations, which can be critical factors to many risky technologies, were missed out on the research.

2.5 Related Research in Finland

In order to localize and specialize the determinants for this research, relevant studies related to FinTech acceptance conducted in Finland will be carefully reviewed. As we can see in the table below, there are various streams of research in investigating different aspects technology acceptance models, among which, some mainly focused on the demographic variables (Laukkanen, & Pasanen, 2008), others majorly emphasized the subjective norms. The related research articles were either conducted with a relatively large sample base, or illustrated the FinTech acceptance studies in a different point of view. Therefore, the reviewing of these excellent articles can not only demonstrate comprehensive ways in analysing the users' intention to adopt different technologies, but also provide broad explanations on the combination of their results and the Finnish culture.

Finnish users were concluded to have access to high technologies and the latest computer system, and they are generally with high educational background, basically cautious even in curiosity. As such, when it comes to finance related information services, variables such as Perceived Usefulness, Perceived Enjoyment, and Social Influence were validated to be the influential impacts to their behaviour intentions and therefore will be included in this study. Many of the variables cited from other models have been verified, which indicated a broad view for this research. In addition, Pikkarainen et al. (2004) claimed the amount of information on online banking to be the most influential factor in their research and suggested managers of banks to provide more information in the planning and development of online banking services. Considering the similarities between Plastic card and online banking, this variable (amount of information) will also be discussed and analysed in the context of adopting Plastic Card in the following section.

Table 1 Related Research in Finland

Authors	Theoretical Background	Topic & Sampling (in Finland)	Adopted Determinants
Mari, S (2003)	Innovation Diffusion Theory	Mobile Banking (Survey Sample: 1253)	<ol style="list-style-type: none"> 1. Relative Advantage* 2. Complexity 3. Compatibility* 4. Observability* 5. Trial-ability* 6. Risk 7. Time* 8. Communication* 9. Consumer characteristics*

Pikkarainen, T., Pikkarainen, K., Karjaluoto, H. & Pahnla, S. (2004)	Technology Acceptance Model	Online Banking (Survey Sample: 268)	<ol style="list-style-type: none"> 1. Perceived usefulness** 2. Perceived ease of use 3. Perceived enjoyment* 4. Information on online banking* 5. Security and privacy 6. Quality of internet connection
Mallat, N., Rossi, M., Tuunainen, V.K., Öörni, A. (2008)	Technology Acceptance Model; Innovation Diffusion Theory	Mobile Ticketing (Survey Sample: 362)	<ol style="list-style-type: none"> 1. Ease of use* 2. Usefulness* 3. Attitude* 4. Social influence* 5. Compatibility** 6. Cost 7. Prior experience** 8. Trust* 9. Risk* 10. Use context* 11. Mobility*
Mallat, N. (2007)	Innovation Diffusion Theory	Mobile Payments (46 interviewees)	<ol style="list-style-type: none"> 1. Relative advantage* 2. Compatibility 3. Complexity 4. Costs 5. Network 6. Trust 7. Perceived security risks
Laukkanen, T., & Pasanen M. (2008).	Theory of Acceptance and Use of Technology	Mobile Banking (Survey Sample: 2482, 1224 from Finland)	<ol style="list-style-type: none"> 1. Gender* 2. Age 3. Household income 4. Level of education 5. Previous experience* 6. Mobility at work* 7. The fact that who pays the phone bills

* Determinant that has been verified

** Verified determinant with the strongest influence on use intention

2.6 Research Hypotheses Formulation

The primary purpose is to find out the possible variables which affect users' adoption rate in terms of the unique features of FinTech products and the second purpose is to propose a conceptual research model based on consumer acceptance theories from information system field. Combining the models introduced in the former part and the articles of FinTech research in Finland, this sector will select the potential constructs to build a conceptual FinTech acceptance model and develop relationships between variables. Chau et al. (2002) firstly adopted three dimensions framework, which includes individual context, technological context and implementation context, to apply acceptance research to health sector and to provide recommendations to various stakeholder groups based on different dimensions. The third purpose of this research is to propose practical suggestions for the case company Plastic and FinTech start-ups according to the research results. Therefore, the research framework will be adapted from Chau and Hu's (2002) three dimensions:

1) **Technological context**, refers to the characteristics of the technology itself, on the view of the inherent features of the product or service, includes Perceived Usefulness (PU), Perceived ease of use (PEU), and Price Value (PV).

2) **Individual context**, individual users are grouped into different customer segments with the variables of Personal Innovativeness (PO), Social Influence (SI) and Perceived Need of Minimalism (PNM).

3) **Motivational context**, Chau et al. (2002) use implementation context to apply to the specific professional environment such as health sector. In this research, it is adapted to motivational context to review the triggers that can stimulate users' adoption intention. Variables are Perceived Enjoyments (PE), Security Concerns (SC), and Perceived Information (PF).

Generally speaking, the four models discussed before illustrated the fundamental frameworks and process to study users' adoption in different technology fields. Specifically speaking, the research in Finland combined the characteristics of FinTech and the research location Finland, more pertinent variables can be referred to in this study.

The following part will elaborate the selected determinants from three contexts and the conceptual research framework will be finally formulated.

2.6.1 Technological Context

Theoretically based on TAM and UTAUT, technological context focuses on the inherent characteristics of FinTech. Perceived Usefulness (PU), Perceived ease of use (PEU) and Price Value (PV) will be elaborated in this sector.

Perceived Usefulness (PU) is defined as *“the degree to which a person believes that using a particular system will enhance the job performance”* (Davis, 1989). Similarly, Venkatesh (2003) summarized PU into performance expectancy, which refers to the degree to which an individual believes the gains a system can bring in job performance.

Davis (1989) posited in TAM that PU is the major factor significantly affecting acceptance of IS. PU within different fields is proved to be the strongest predictor of intention (Venkatesh 2003). According to Pikkarainen et al. (2004), their research of online banking acceptance found that PU was one of the most influential factors to explain the intention to use, and the reason for consumers to use online banking was simply for the benefits it can provide comparing to other banking delivery channels. Likewise, Eze, Manyeki, Yaw and Har (2011) concluded that it was evident PU positively influencing the use of Internet banking among young adults and individuals were keen on the advantages a system can offer in comparison to other systems, more precisely, the advantages of the convenience the system can provide, such as to use it anytime and anywhere. Guriting and Ndubisi (2006) also summarized that PU is one of the most popular utilized factors in internet banking literature.

In general FinTech context, PU can be regarded as the benefits that an individual can gain from adopting an application. When using Plastic Card, users can switch different cards by simply sliding the e-ink on one single card. Comparing to carrying a lot of cards, or merely limited site for mobile payments, users just need to carry one card and it is accepted everywhere just as the current credit card. Therefore, they will perceive efficiency and effectiveness in the payments process, and they might also feel that the Plastic Card is convenient and useful, which enable and enhance an easier payment action. PU stands for the efficiency, effectiveness, convenience and usefulness of users' perception.

Hence, applying PU into FinTech context, the first hypothesis is that:

H1: Perceived Usefulness (PU) will have a positive influence on users' intention.

Perceived Ease of Use (PEU) is defined as “*the degree to which a person believes that using the system would be free of effort*” (Davis, 1989). As mentioned in earlier section, TAM is developed from TRA, accordingly, PEU is associated with the user-friendliness based on the external variables such as users’ attitude, system features, training, use instruction, and user consultants. Venkatesh (2003) summarized PEU into effort expectancy, which refers to the perceived difficulty to use a system. Generally speaking, individuals tend to hold positive attitudes when they find the system easy to use.

Rigopoulos and Askounis (2007) reported on the new payment research that PEU has a strong indirect positive relationship and a less strong direct positive relationship to behavioural intention, the indirect relationship was linked through PU to intention. Equivalently, Fagan et al (2008) asserted that PEU was positively related to behaviour intention and PU. Various studies verified their findings. Prompattanakdee (2009) reported that if an individual has been using the system long enough, it is likely that they will find it useful and easy to use. Safeena, et al. (2011) supported this view and concluded that, the easier a user perceived to interact with a system, the more likely they will find it useful. Since the longer the individual stay in use of the system, the more familiar he/she can be with the system, and hence the less anxiety will he/she be aware of.

Venkatesh (2003) reported that, the more widely accepted the system, the less significant influence the effort-oriented constructs will show. During the extended and sustained usage period, the constructs become nonsignificant. As such, PEU is used as a factor more appropriate in the early stage of a system or technology. Plastic Card is not yet released, which makes it a good fit to adopt this construct. In the case of FinTech services, experienced users usually tend to be early adopters of similar new FinTech products. Due to the past operations, they can quickly start a new system without extra efforts. Plastic Card can be simply seen as the intelligent set of all the smart cards, thus smart card users are already experienced in using it. Plastic Card is a substitute in payment methods that the perceived ease of use enables users to feel the intention to adopt it and also sense it is useful for their everyday life. Thus hypotheses are as follows.

H2a: Perceived ease of use (PEU) will have a positive influence on users’ intention.

H2b: Perceived ease of use (PEU) will have a positive influence on Perceived usefulness (PU).

Price Value (PV) is defined as the consumers' cognitive trade-off between the perceived benefits of the system use and the monetary cost for using them (Venkatesh et al., 2012; Dodds et al., 1991). Unlike organisational system use, the individual consumers are usually facing the pressure to balance the benefits and costs. The price value will positively influence the behaviour intention when the perceived benefits are greater than the monetary cost. (Venkatesh et al., 2012).

It was evident in the research of consumer behaviour domain that the perceived price value can successfully enhance consumers' intention to purchase the product and improve customer satisfaction (Grewal, Monroe, and Krishnan, 1998). Likewise, after analysing the effect of price value on attitudinal and behavioural components of loyalty in a service context. Pura (2005) concluded that behavioural intention and customer commitment were significantly affected by their perceived value. Furthermore, Wu and Wang (2005) reported that the price has a positive influence on user intention in mobile commerce since the higher price implicates an additional trust and a higher quality, they also concluded that users with a better financial status were less sensitive to the price change. In addition, Xu (2014) presented in the research of online games that price value was also important on users' intention to the continuous use.

When switching a brand, an equipment or an application, users inevitably have to consider the price, time, effort and knowledge investing in the new solution (Mikael, & Frank, 2011). Especially when it comes to emerging technologies, there is a lack of price level as reference, users will estimate new products in comparison to the promised features and functionalities. As long as all the expectations are met, the price would be worth the value. Plastic Card as an innovative and novel payment solution, is said to be the bridge of traditional card and completely digital technology. With the appearance of regular credit card, Plastic Card enables users to experience mobile payments and digital wallet way beforehand and can largely reduce the trouble caused by carrying a lot of cards in the everyday life. More importantly, the pre-order price is lower than the future retail price, considering the convenience and functionalities it can bring, the future raising price might encourage users to agree on the current price. Hence, the price value is essential and the following hypothesis is proposed:

H3: Price Value (PV) will have a positive influence on users' intention.

2.6.2 Individual Context

Theoretically based on RTA, individual context focuses on the personal awareness and aims at defining the target group for Plastic Card. Personal Innovativeness (PO), Social Influence (SI) and Perceived Need of Minimalism (PNM) will be elaborated in this sector.

Personal Innovativeness (PO) is defined as the willingness of an individual to try out new information technology (Agarwal & Prasad, 1998). Generally speaking, innovative individuals tend to be more self-confident in performing new tasks when facing new situation (Kegerreis, Engel & Blackwell, 1970). In IT context, individuals with high level of personal innovativeness are more active at seeking out stimulating experiences and more confidence in their capacity to use a new technology (Agarwal et al., 2000; Rouibah & Abbas, 2010). It is a construct generally studied in innovation diffusion research and has been applied to the domain of information system recently (Limayem, Khalifa, and Frini, 2000).

Yi, Jackson, Park and Probst (2006) concluded that personal innovativeness was a significant determinant of both perceived usefulness and perceived ease of use in the information technology adoption research among individual professionals. In consistent with their research, Parveen and Sulaiman (2008) also reported that personal innovativeness showed a positive and moderate relationship with perceived usefulness and perceived ease of use in the adoption of Wireless Internet on mobile devices. While in another opinions, Xu and Gupta (2009) asserted that Personal Innovativeness positively influence individuals' intention especially towards potential users. Similarly, Zarpou, Saprikis and Vlachopoulou (2010) conducted a survey and received 445 responses in Greece on mobile service adoption research, they result indicated that Personal Innovativeness was verified to have the strongest effect on adoption intention.

Innovativeness is a personal characteristic that varies in different individuals. Users with high level of personal innovativeness might show higher curiosity and interests when getting encounter with Plastic Card and therefore stimulate the confidence in actual use and tend to be early adopters. Thus hypothesis is as follows:

H4: Personal Innovativeness (PO) will have a positive influence on users' intention.

Social Influence (SI) refers to individual's internalization of the reference group's subjective culture (Thompson, et al., 1991). Some other studies added image and status symbol into this concept (Moore & Benbasat, 1991). Venkatesh et al. (2003) defined it as the influence of others who are important to an individual on the adoption of new system. Social influence was explained to affect individual behaviour through compliance, internalization, and identification, which can be generalized as the response to social pressure, potential gains in social status, and changes in beliefs structure (Venkatesh et al., 2000).

For finance related products, in particular, due to the unknown danger, users usually tend to be more cautious in the decision-making process, apart from doing a lot of pre-check, social influence will be of importance that other people's opinion or experience can largely reduce the suspicious and intrust of a totally strange FinTech product. Plenty related studies on mobile payments and e-commerce emphasized that network effect plays a vital role in nowadays emerging technologies and many researchers agree that social influence has a significant influence on behavioural intentions (Wu & Wang 2005; Wei, Marthandan, Ching, Oi & Arumugam, 2009). Furthermore, Kim, Choi, Park and Yeon (2016) noted that social influence and intention to use were positively related in the way of network effect and suggested that resolutely connection policy on different services and lower entry barriers would be necessary to increase the user base in FinTech applications.

Plastic Card as an emerging technology is not widely promoted yet, early adopters might discuss with the experienced buyers. In the meanwhile, the continuous demonstration might be asked to satisfy others' curiosity. Consequently, with the spread of the Plastic Card, the increasingly number of individuals might start to use mainly due to the recommendation of people important to them or the proportion of peers who use it. Individuals easily get influenced by people around them will keen on others opinions, and care about their social images, they are not the earlier adopters but with high potential to be the followers when Plastic Card get widely adopted.

Hence the hypothesis is that:

H5: Social Influence (SI) will have a positive influence on users' intention.

Perceived Need of Minimalism (PNM), in this research, refers to the degree to which an individual believes the lifestyle should be simplified. Minimalism was firstly famous as the unique style in the visual arts and music. Recently minimalism has gradually become a fashionable lifestyle by fewer material possessions. Various books and articles were written to promote this life attitude and style. Minimalists insist that less stuff brings more joy (Jay, 2010), and against the excesses of too much of everything (mnmlist.com, 2016).

In consumer behaviour research, lifestyle is regarded as the primary factor for customer segmentation. Different segmentations are keen on different aspects of the product or service. Complicated consumer behaviours can be explained by different lifestyles on three aspects: opinions, attitudes and activities. Lifestyle basically refers to the way a group of consumers spend time and money and develop feelings about the brand. As such, the need of minimalism lifestyle will probably lead to the pursuit of products that can simplify the life. (Novak, 2010)

On one hand, Finland is well-known in minimalism style of fashion (Sjöroos, 2016), art, music, and the Finnish character (Kinsman, 2015). The typical Finnish personality is consistent with the essence of minimalism that Finnish people prefer the simplified lifestyle (Kinsman, 2015). On the other hand, Plastic Card is a concept to minimize individuals' everyday life by firstly simplifying their wallet to a more slimmed one and then simplifying the payment process, which enable customers to travel light and live a minimized life. It is worth mentioning that, Plastic Card has already got widely introduced and discussed on minimalist forums and many of the positive comments were proposed, and hence, it is expected that individuals with the need of minimalism might show higher possibility in adopting Plastic Card. In the meanwhile, Perceived Need of Minimalism is to some extent a psychological need, thus it is also expected to positively linked to the factor of Perceived Enjoyment. The more an individual need for minimalism, the more likely he or she will think it is enjoyable when using Plastic Card and hence the more likely he or she would adopt it.

Therefore, hypotheses are as follows,

H6a: Perceived Need of Minimalism (PNM) will have a positive influence on users' intention.

H6b: Perceived Need of Minimalism (PNM) will have a positive influence on Perceived Enjoyment (PE).

2.6.3 Motivational Context

Theoretically based on MM, motivational context focuses on the external incentives of users' adoption intention. Perceived enjoyment (PE), Security Concerns (SC) and Perceived Information (PF) will be elaborated in this sector.

Perceived Enjoyment (PE) was subsumed under the intrinsic motivation by Davis et al. (1992) and defined as the perception that users will want to perform an activity for no apparent reinforcement apart from the process of performing the activity itself (Davis et al., 1992). As mentioned in MM, theories of psychology concluded that individuals may engage in a particular behaviour because it is inherently interesting or enjoyable (Deci et al., 1985), as such, individuals might adopt technology because it is interesting or enjoyable.

There is substantial empirical support for this view. Moon and Kim (2001) asserted that the perceived playfulness, which consists of concentration, curiosity and enjoyment, had a significant impact the intention to use internet. Teo, Lim and Lai (1998) found that individuals use the system mainly because they perceived it to be useful and secondary for the reason that it is enjoyable. Usefulness might be linked to a somehow forced action, such as to complete an assignment, whereas, enjoyment obtained from the using procedure entirely dependent on the users' subjective feeling. Furthermore, it was established that new users tend to feel the enjoyment and be fascinated by the capabilities of the system in the initial stage, however, the continued usage is largely decided by the perceived usefulness (PU) (Teo et al., 1998).

For the context of Plastic Card, it is a brand new payment solution with the intelligent e-ink design. Sliding to unlock and switch card operation is deemed to be enjoyable, the design of Plastic Wallet app is regarded to be pleasant. It is supposed to be fun to use this intelligent new payment solution. Thus this positive feelings about performing the activity will have a direct or interactive influence on intention.

Based on these findings, hypothesis can be:

H7: Perceived Enjoyment (PE) will have a positive influence on users' intention.

Security Concerns (SC) is defined as the beliefs of the buyers on the sellers' inability and unwillingness to safeguard the monetary information from security breaches during transmission and storage (Salisbury, Pearson, Pearson & Miller, 2001; Gupta et al., 2010). For instance, in e-commerce consumers will feel secure when sellers adopt the secured payment mechanisms that prevent the leakage of credit card information and use the technology that will keep a system safe from hackers (Mukherjee & Nath, 2003). Security concerns refer to both hidden information and hidden action issues that buyers will consider whether the sellers are willing and able to protect the buyers' monetary information from hackers (Pavlou, Liang and Xue, 2007).

Suh and Han (2003) asserted in their research that, due to the inherent vulnerabilities of the internet, security is one of the biggest challenges faced by potential ecommerce customers. In spite of the strong confidence in their bank, customers tend to have weak confidence in the technology (Roboff & Charles, 1998). Gupta et al. (2010) noted that security concerns significantly influenced users' intention to adopt a risky technology and the effect of control is stronger than the effect of risk, more precisely, regardless of the potential risk, the adoption rate will increase on condition that customers feel themselves in control of their transaction (Pavlou, et al. 2007).

Plastic Card can be described as a copy of all the other cards, therefore, users are supposed to input all their personal information into the app and the e-ink card. For one thing, customers might hesitate to provide the sensitive information to the company Plastic.com. For another, the accumulation of all the cards can be regarded as the accumulation of all the insecurity worries caused by each specific card. The more number of cards they would like to store in Plastic Card, or the larger the amount of money they have in their card, the more likely for the buyers to be laden with anxiety. The imagination of suffering financial problems in the future will largely decrease the enthusiasm and consequently, security concerns would be a big obstacle in promoting Plastic Card in the initial stage.

And hence the hypothesis is that:

H8: Security Concerns (SC) will have a negative influence on users' intention

Perceived Information (PF) is a new construct not included in any of the models introduced before. It can be defined as the amount of information a company offers to the buyers. This could be any information that buyers get unintentionally in the means of commercial in TV or friend's recommendations, and intentionally through searching online, browsing from the website of Plastic Card.

Sathye (1999) found that one of the biggest obstacles of online bank adoption was the low awareness of potential users. According to Sathye (1999), online banking service was fairly new experience that many consumers were unaware of the possibilities and concerning information, thus only few of them choose to adopt it. Similarly, Gulamhuseinwala, et al. (2015) reported that awareness is the main hurdle why the substantial majority of their respondents have not used FinTech products. In their research, 53.2% of 7539 non-FinTech users responded that they simply had not aware of the existence of FinTech services. Undoubtedly, the awareness of users plays a vital role in the promotion stage, while the more the information the users perceived, the better they will know about the product.

Gefen and Straub (2000) described the two primary consumer behaviours for online shopping as firstly searching for enough information of the product and then confirm the purchasing. Similarity, Pikkaranen et al. (2004) adopted Amount of Information on Online Banking as one of the constructs in their research model, the results indicated that Perceived Usefulness and the enough Amount of Information on Online Banking were the most influential factors explaining the intention to use online banking services. Furthermore, Kim and Benbasat (2003) asserted that consumers prefer to get enough information of product purchasing not only for the purpose of knowing about the functionalities but also to reduce the uncertain security issues during the whole process.

As such, the reasons for not using Plastic Card may also stem from the unawareness of the existence of Plastic Card and the lack of the concerning information. On the other side, when users fully understand the Plastic Card, their doubt on security issues will be lower. The more information they perceived, the more likely they will use it.

Hypotheses are as follows:

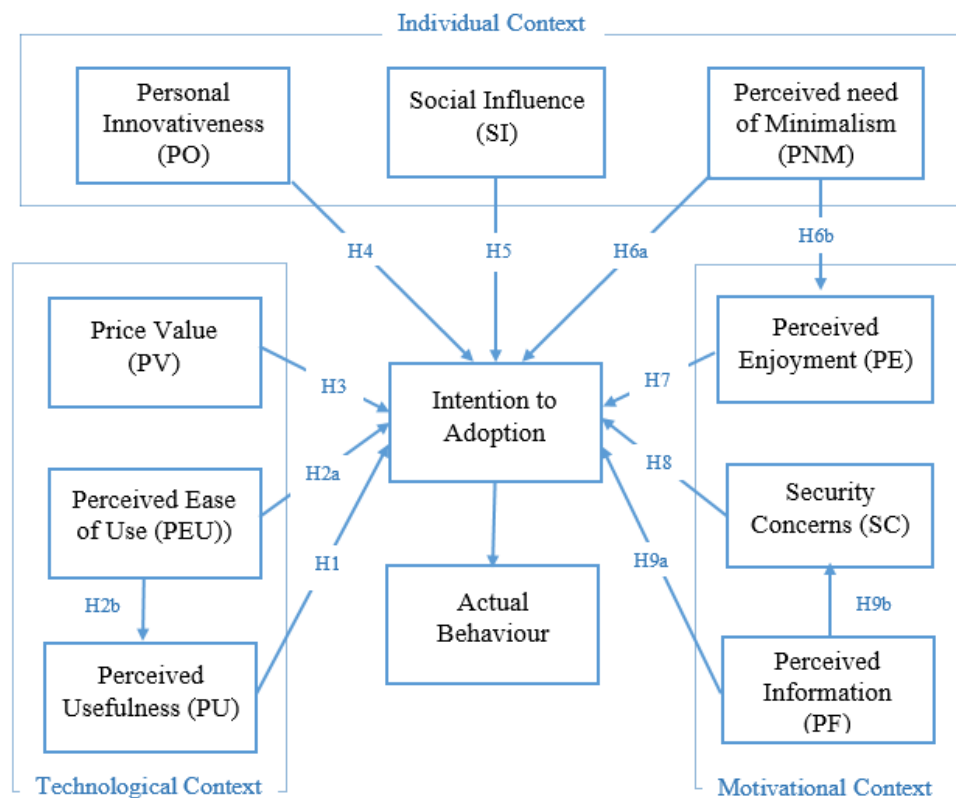
H9a: Perceived Information (PF) will have a positive influence on users' intention

H9b: Perceived Information (PF) will have a negative influence on Security Concerns (SC)

2.7 Research Model

After examining the most related frameworks described as above, the following figure shows the proposed conceptual model for investigating the factors affecting users' behaviour intention.

Figure 8 The Conceptual Model



H1: Perceived usefulness (PU) will have a positive influence on users' intention.

H2a: Perceived ease of use (PEU) will have a positive influence on users' intention.

H2a: Perceived ease of use (PEU) will have a positive influence on Perceived usefulness (PU)

H3: Price Value (PV) will have a positive influence on users' intention.

H4: Personal Innovativeness (PO) will have a positive influence on users' intention.

H5: Social Influence (SI) will have a positive influence on users' intention.

H6a: Perceived Need of Minimalism (PNM) will have a positive influence on users' intention.

H6b: Perceived Need of Minimalism (PNM) will have a positive influence on Perceived Enjoyment (PE).

H7: Perceived Enjoyment (PE) will have a positive influence on users' intention.

H8: Security Concerns (SC) will have a negative influence on users' intention

H9a: Perceived Information (PF) will have a positive influence on users' intention.

H9b: Perceived Information (PF) will have a negative influence on Security Concerns (SC)

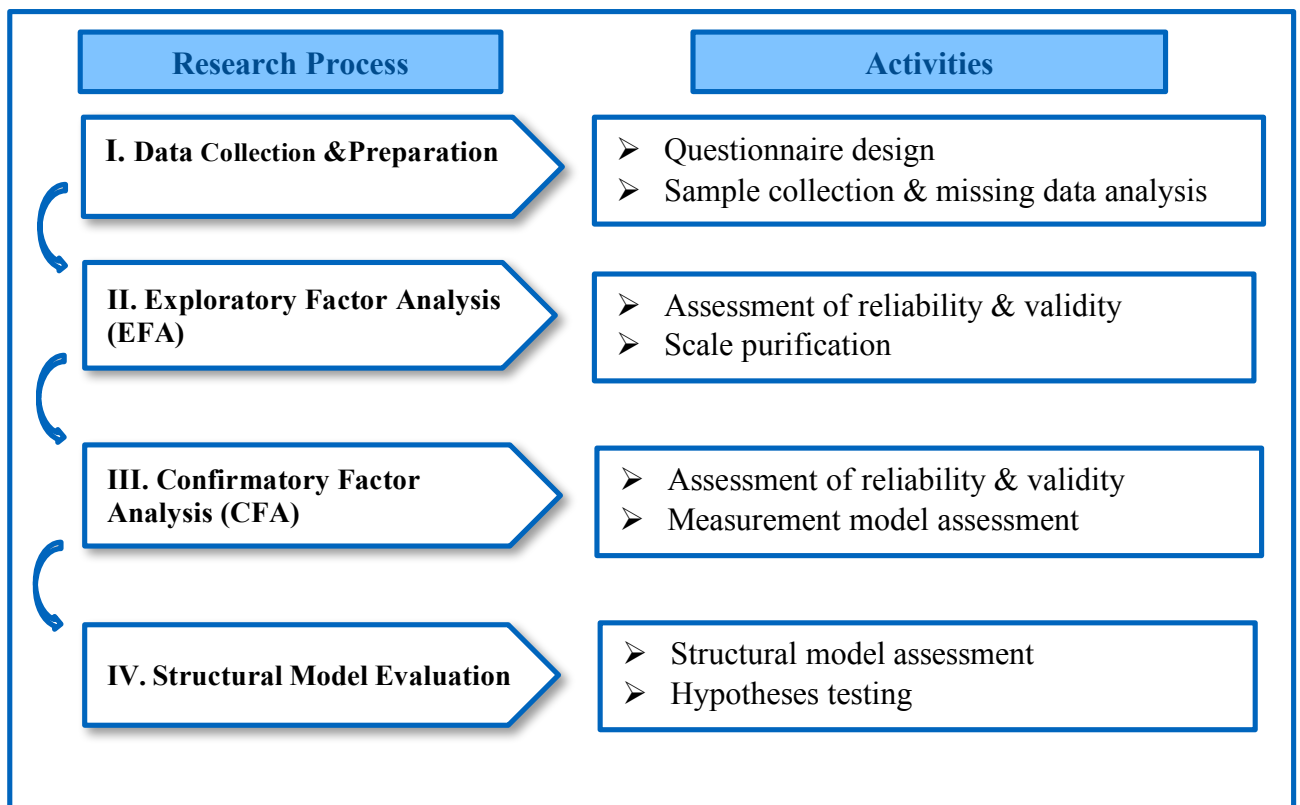
3 Research Methodology

Based on the proposed conceptual model, this chapter mainly introduces the design of research. It is aimed at building an empirical framework for analysing the collected data, thus the research approaches are elaborated and the primary methods such as EFA, CFA and SEM are explained, questionnaire design is expatiated, and data and sample description are illustrated.

3.1 Research Approaches

Consistent with existing studies about customer acceptance research in which measurements were made under users’ perceptions, this study employs nine different constructs expected to affect user’s intention, and assumes that user intention will directly lead to actual usage. Therefore, specific statistical techniques should be adopted to evaluate the conceptual model. The figure below shows an overview of the research design: columns on the left indicate the process for data process, and columns on the right further explain the corresponding activities. The following part mainly focuses on the introduction of research techniques and the design of questionnaire so as to make theoretical preparation for the data analysis.

Figure 9 Research Procedures



3.1.1 Factor Analysis

Theoretically based on RTA, Factor Analysis is a collection of various statistical techniques to estimating the population-level structure underlying the variations of observed variables and their interrelationships (Gorsuch, 1983). Acts as a diagnostic tool, factor analysis enables researchers to evaluate the relationship between collected data their theoretically expected structures of the target constructs, thereby to determine to which level the planned measurements reach the measuring purpose (Matsunaga, 2010). Two methods of factor analysis will be employed in this study: Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA).

Exploratory Factor Analysis (EFA) is a standard statistical technique for evaluating measurement models (Kline, 2010). EFA is a board term including centroid, principal components, and principal factor analysis methods which allow for deriving factors. EFA is used to test unrestricted factor models thus all factors can load on the other factors. Researchers usually utilize EFA to identify the unobserved factors when they are unsure about the underlying mechanisms of the target phenomena (Matsunaga, 2010), therefore, it can help explore the actual correlations between items, rather than just theoretical. It is not necessary to predetermine the number of factors or predefine which items will load on which factors before EFA. After analysing the adequacy of the data sample, EFA is conducted in three procedures 1) Extraction: determining the number of factors underlying the variation; 2) Rotation: identify the items loading onto factors; 3) Interpretation: removing the items with low factor loading, or not load to any the factors (Thompson, 2004; Matsunaga, 2010).

Confirmatory factor analysis (CFA) is used to evaluate the relationships between the observed variables and the latent variables (Baker & Kim, 2004). After hypothesizing a priori model of the underlying structure, researchers utilize CFA to examine whether the model fits the data adequately and to study the measurement invariance and population heterogeneity (Bandalos, 1996). EFA enables to explore the factors and CFA enables to confirm the factor structure extracted in EFA. In spite of the fact that many of the constructs adopted in the conceptual model have been validated in earlier research, it is necessary to do the reliability and validity measurements with both EFA and CFA. For one thing, FinTech and Plastic Card both are new and novel topics to be studied under acceptance model. For another, constructs such as perceived information (PF) and perceived need of minimalism (PNM) are not widely studied. Therefore, both EFA and CFA will be employed in the process of data analysis.

3.1.2 Structural Equation Model (SEM)

SEM is a comprehensive statistical modelling tool widely used for testing hypotheses about relations among observed and latent variables (Hoyle, 2012). It is a powerful collection of multivariate analysis techniques accessed through two main sets of equations, measurement equations and structural equations (Byrne, 2010). SEM employs various theoretical models to test hypotheses, check how sets of variables define constructs and how constructs are related to each other, SEM analysis is applied to determine the level of sample data to support theoretical model (Schumacker & Lomax, 2004).

SEM enables researchers to access the constructs and test the proposed theoretical relationships in an integrated and unified manner (Gurski, 2014). Compares to multiple regression, SEM provides more goodness of fit indices for the full structural model (Hair, Babin, & Anderson, 2010). The reasons to apply SEM in this study is not only because of the superior empirical results that it can provide, but also for the fact that the proposed determines in the conceptual model are entirely based on perceptions, thus they all belong to latent constructs, which makes this study a good case to for this advanced technique. The primary purpose of conducting a hypothesized conceptual model in SEM is to finally confirm a model that should not only statistically fit the data well, but also adequately enhance each parameter of the model to give a substantively meaningful interpretation (Joreskog, 1993).

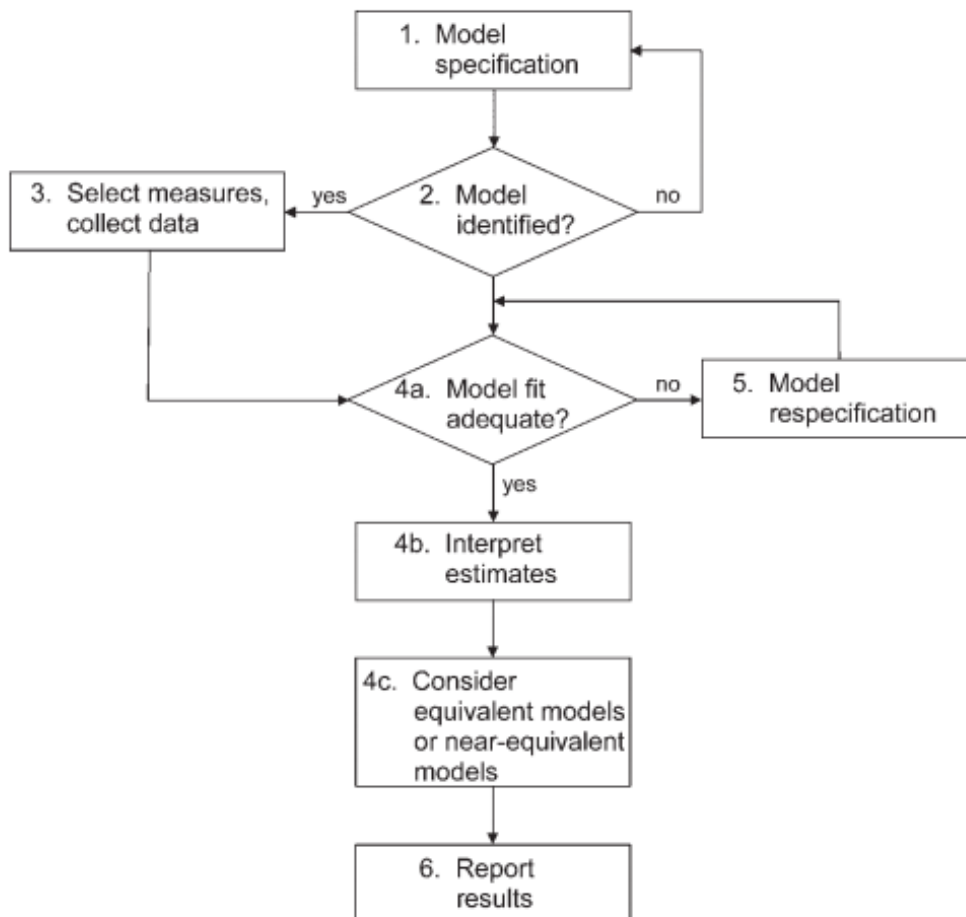
SEM consists of a measurement model and a structural model. On one hand, the measurement model describes the relationship between observed dependent variables, which act as factor indicators, and the latent variables, which act as factors. As mentioned before, CFA is a type of structural equation modelling dealing specifically with measurement models, it is in fact the foundation of SEM since all latent variables analysed rely on a sound measurement model (Hoyle, 2012). On the other hand, the structural model indicates the relationship among factors, the relationship among observed variables, and the relationship between factors and the observed variables.

There is a debate about the proper sample size needed for SEM. Some researchers strongly suggested the necessity to increase the sample size since the insufficient size might lead to a considerable risk of misspecification of the model and bias in the measurement scales (Matsunaga, 2010). However, a more recent research found that, sample size requirements can range from 30 up to 450 cases according to the model complexity and some other factors (Wolf,

Harrington, Clark, & Miller, 2013). Hair, Anderson, Tatham and Black (1998) recommended minimum sample size of 100 to 150 to ensure the stable maximum likelihood Estimation (MLE) solution. This study collected 117 respondents which can be regarded as an adequate sample size.

Most research followed a basic six-step procedure of SEM. It is manifested in the flowchart that the first step is to specify the model by determining which parameters to be fixed or free; The second step is to evaluate model identification, the idea is to have at least one unique solution for each parameter estimate from the observed data; The third step is to estimate the model and the fourth step is to test the model fit and assess the model validity; The fifth and sixth steps are to specify the structural model and to assess structural model validity. CFA involves step one to four and SEM is in step 5 to 6. This is also the data analysis procedure in this study after EFA. (Kline, 2011, P 92)

Figure 10 Flowchart of SEM (Kline, 2011)



3.2 Survey Design

The research survey consisted of four pages and a cover letter, which introduced the basic information of Plastic Card (See **Appendix A**). Davis (1989) observed that, a brief hand-on introduction can enable individuals to form general perceptions of a system’s usefulness, as such, it would strongly link to user intention and future acceptance of the system. Besides, Plastic Card is not released yet thus seldom individuals really heard of it, let alone knowing it and answering questions about it. Therefore, the first part listed a brief introduction of Plastic Card and its features, a short demonstration video to show how it works, and few pictures of the configuration and the interface of the card and the application. In the meanwhile, a link leads to the Plastic official website was listed to encourage respondents to get more information. The cover letter is shown in Appendix A. After that, page one to page three covered construct measurements of the conceptual model, technological context based on TAM and UTAUT, motivational context based on MM, and individual context based on RTA were respectively presented by three constructs in each page. The table below shows the questions and the source of each construct. A Likert 7-point scale was applied in all these questions with “1 = Strongly disagree”, “2= Disagree”, “3 = Somewhat disagree”, “4= Neither agree or disagree”, “5 = Somewhat agree”, “6 = Agree”, “7 = Strongly agree”. Page four covered the demographic variables and respondents’ actual smart card usage, it is shown in next section.

A pre-test has been conducted among 3 persons group before releasing the survey, each of them completed the first version and wrote feedback for improvements. According to them, more information about the condition of losing the Plastic Card should be provided and the description of PU1 is ambiguous and misleading. Accordingly, an explanation of actions towards losing Plastic Card was added in the cover letter and the description “from switching cards” was added to the first question to clarify the specific use context. In general, after the three respondents confirmed that the survey was clear, it was finally released.

Table 2 Overview of Questionnaire Design

Construct	Item	Question setting	Source
Perceived Usefulness(PU)	PU1	Using Plastic Card will make my payment behavior more quickly (From switching cards).	Davis (1989)
	PU2	I think using Plastic Card will make my life easier.	Davis (1989)
	PU3	I would find Plastic Card useful in my everyday life.	Davis (1989)

Perceived Ease of Use(PEU)	PEU1	Learning how to use Plastic Card would be easy for me.	Davis (1989)
	PEU2	The interaction with Plastic Card and the app is clear and understandable.	Davis (1989)
	PEU3	I find Plastic Card easy to use.	Davis (1989)
Price Value (PV)	PV1	I think Plastic Card is reasonably priced.	Venkaresh et al. (2012)
	PV2	I think Plastic Card will be a good value for the money.	Venkaresh et al. (2012)
	PV3	At the current price, Plastic Card will provide a good value.	Venkaresh et al. (2012)
Perceived Enjoyment (PE)	PE1	Using Plastic Card will be fun.	Davis (1992)
	PE2	Using Plastic Card will be pleasant.	Davis (1992)
	PE3	Using Plastic Card will be enjoyable.	Davis (1992)
Social Influence(SI)	SI1	People like me should use Plastic Card.	Thompson et al. (1991)
	SI2	People who are important to me might think that I should use Plastic Card.	Davis (1989)
	SI3	Most of my peers are using it, I should also use it.	Thompson et al. (1991)
Perceived Information (PM)	PM1	I have generally received enough information about Plastic Card.	Pikkarainen et al. (2004)
	PM2	I have received enough information about the benefits of Plastic Card.	Pikkarainen et al. (2004)
	PM3	Overall, I think I have enough understanding of Plastic Card.	Pikkarainen et al. (2004)
Security Concerns (SC)	SC1	I feel secure to use Plastic Card (Reverse-coded Items).	Gupta et al. (2010)
	SC2	Security is the primary worry when considering to buy Plastic Card.	Gupta et al. (2010)
	SC3	Overall, I think Plastic Card is safe for using (Reverse-coded Items)..	Gupta et al. (2010)
Personal Innovativeness (PO)	PO1	I like to experiment with new information technologies.	Agarwal et al. (1998)
	PO2	Among my peers, I am usually the first to explore new information technologies.	Agarwal et al. (1998)
	PO3	If I heard about a new information technology, I would look for ways to experiment with it.	Agarwal et al. (1998)
Perceived Need of Minimalism(PNM)	PNM1	I prefer the "less stuff = more joy" lifestyle.	Jay (2010)
	PNM2	I am accustomed to simplicity.	Jay (2010)
	PNM3	I prefer travel light instead of taking a lot of baggage.	Jay (2010)
Intention to Adoption	INT1	I plan to use Plastic Card in the future.	Venkaresh et al. (2012)
	INT2	I intend to use Plastic Card in the future.	Venkaresh et al. (2012)
	INT3	I predict I would use Plastic Card in the future.	Venkaresh et al. (2012)

3.3 Data Collection and Sample Description

The study is about users' acceptance research in Finland, hence all the chosen respondents are either Finnish or currently live in Finland. The questionnaires can be accessed through a website link. 230 invitations to the link were sent to Facebook friends and returned 122, which reached a response rate of 53%. Among the 122 responses, 5 of them was uncompleted, thus 117 were used for data analysis. All the questions were set as compulsory to answer, only the completed ones can be returned, thus there was no missing data and the data screening procedure was done by the questionnaire website automatically.

As we can see in the respondents demographic below, the gender division is close to be equal with the respondents' rate of female 47% and male 53%. The age shows an obviously centralized distribution, of which 91.5% are the young from 18 to 34 years old. Similarly, the education level also shows a concentrated distribution that 43.6% are with Bachelor's degree and 41% are with Master's degree, which means the respondents are with quite high education background. In terms of the card amount, 40.2% of respondents have 0 to 5 cards, 29.1% have 6 to 10 cards, and 25.6% have 11 to 15 cards, this brought out the fact that, over half of the respondents own 6 to 15 cards, they all have the potential to become the user of Plastic Card. When it comes to the frequency of card use, "multiple times a day" turns to be the most ordinary case since it accounts for 59.8%, and the second frequency is "once a day". In conclusion, the respondents are equally distributed in gender and education level, they are aged from 18 to 34, with the card amount of 6 to 15 and daily use of at least one time. The group shows the adequacy of representativeness of the research.

A wide variable range should be reached to ensure the generalizability, and the potential users is estimated to be the one with high salaries, owns a lot of smart cards, however, such resources are not available to the writer. Most of the respondents in this research are students, thus the survey didn't include the salary related item. On the other hand, as concluded in last paragraph, the majority is young generations with high education levels, most of them have 6 to 15 smart cards now and might increase the amount in the future. Currently they are students but soon will graduate and get the jobs. Therefore, in the near future when FinTech products get prevalent or largely prompted, there is a high chance that this group are the target customers those companies trying to reach.

Table 3 Respondents Demographic

		Frequency	Percent (%)
Gender			
	Female	55	47
	Male	62	53
Age			
	0 to 17	0	0
	18 to 24	38	32.5
	25 to 34	69	59.0
	35 to 44	7	6.0
	45 to 54	3	2.6
	Over 55	0	0
Education			
	High school or equivalent	12	10.3
	Bachelor's degree	51	43.6
	Master's degree	48	41.0
	PhD or higher	4	3.4
	Others	2	1.7
Amount of card			
	0 to 5	47	40.2
	6 to 10	34	29.1
	11 to 15	30	25.6
	16 to 20	5	4.3
	21 and above	1	.9
Card Use Frequency			
	Multiple times a day	70	59.8
	Once a day	24	20.5
	2 to 3 times a week	13	11.1
	Once a week	8	6.8
	I don't have one now	1	.9
	Others	1	.9

4 Data Analysis

In accordance with the description in research methodology section, this chapter firstly applies EFA to explore the actual correlations among items, then utilizes CFA to assess the measurement model, furthermore use SEM to estimate structural model and test hypotheses. This study employed IBM SPSS Statistics 23.0 and IBM Amos 23.0 to respectively conduct EFA and draw both measurement model and structural model.

4.1 Exploratory Factor Analysis

4.1.1 Adequacy Assessment

The data screening procedure was explained in last chapter, hence at this point the collected data is well prepared for the analysis. First of all, it is necessary to assess the adequacy of the data set before conducting EFA. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was chosen in SPSS. Different number in KMO statistic represents different levels of interpretation. According to Kaiser (1974), the best level is above 0.9, which is “marvellous” and below 0.50 is regarded as “unacceptable”. As shown in the table below, the KMO 0.800 means “meritorious” (Kaiser, 1974) of adequacy for this data set. In the meanwhile, a significant result (Sig. < 0.05) shows that it is not an identity matrix. In conclusion, the variables in this data set are indeed related to each other and thus it is adequate to run a meaningful EFA.

Table 4 KMO & Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.800
Bartlett's Test of Sphericity	Approx. Chi-Square	2521.747
	df	435
	Sig.	.000

4.1.2 Reliability Assessment

Principal Components was chosen for Extraction Method, and Promax was used as Rotation Method when conducting EFA. It is manifested in Table 5 that, the initial pattern matrix consists of five different items. Cronbach's Alpha for each construct, Mean, Std. Deviation, and Extraction for each item under the corresponding construct, and the factor loading for each

item. Reliability refers to the ability of an instrument to measure consistently and it is reflected by these five indicators. (See **Table 5**)

In EFA, the way to test reliability is to compute **Cronbach's Alpha** for each factor. It is known as an internal consistency estimate and it is regarded to be the most widely used reliability coefficient in academic research (Osborne, 2008). Cronbach's Alpha presents the extent to which a set of items describes the single unidimensional latent construct and it is essentially a correlation between the item responses in a questionnaire, thus Cronbach's Alpha will be high if the correlations between each corresponding questionnaire items are high (Andrew, Pedersen, & McEvoy, 2011). The value of Cronbach's Alpha ranges from 0 to 1 in which the value under 0.5 the internal consistency is "Unacceptable", from 0.5 to 0.6 is "Poor", from 0.6 to 0.7 is "Acceptance", from 0.7 to 0.8 is "Adequate", from 0.8 to 0.9 is "Good" and above 0.9 the internal consistency is regarded as "Excellent" (George & Mallery 2000). **Mean** and **Std. Deviation** are the used to indicate the average level of each item and the degree to which the response in a distribution differ from the mean. A communality is the level to what degree an item correlates with all the other items and it is shown as **Extraction** in the column. It measures the percent of variance in a given item and interpreted as the reliability of the indicator. Regardless of sample size or the presence of model error, the high the value of communalities is, the better the recovery of population factors in sample data (MacCallum, Widaman, Preacher, and Hong, 2001). It is suggested that communalities should be greater than 0.6, and it would be great if all the values are above 0.8 (Costello & Osborne, 2005).

Pattern matrix shows a series of standardized regression coefficients expressing the variable with the function of **Factor Loadings**, which describes the unique relationships between each item and each factor (Osborne & Banjanovic, 2016). Factor loadings can take positive or negative values ranging from -1 to +1. The item with high loadings on a factor refers to a strong correlation to the factor. As such, a factor loading of zero approximately indicates that there is no relationship between the item and the factor and a negative factor loading means that the item holds the opposite way of it is described to measure. The value of the factor loading is closely bound up with the sample size. Hair et al (1998) clarified that the level of factor loadings are based on the sample size, big sample size usually allow for lower factor loading. With the sample size of 100, factor loading should be 0.55 and with the sample size 120 factor loading should be 0.5 (Hair et al., 1998). In this study, the accepted sample size is 117 thus the

effective factor loading would be at least around 0.50. The following table is the initial pattern matrix.

Table 5 initial Pattern Matrix

Pattern Matrix														
	Cronbach's Alpha	Mean	Std. Deviation	Extraction	PU	PEU	PV	PE	SI	PF	SC	PO	PNM	INT
PU1	0.878	5.03	1.348	0.817	.942									
PU2		5.24	1.039	0.868	.967									
PU3		5.03	1.286	0.803	.814									
PEU1	0.827	5.80	.912	0.781		.887								
PEU2		5.67	.928	0.793		.685								
PEU3		5.49	1.005	0.755		.528								
PV1	0.882	3.39	1.319	0.808			.881							
PV2		3.87	1.270	0.844			.879							
PV3		3.70	1.268	0.852			.924							
PE1	0.918	5.13	1.141	0.871				1.02						
PE2		5.20	1.069	0.804				.801						
PE3		5.11	1.143	0.889				.955						
SI1	0.810	4.38	1.325	0.785					.679					
SI2		4.14	1.319	0.787					.622					
SI3		3.75	1.597	0.648					.569					
PF1	0.868	4.80	1.281	0.811						.891				
PF2		4.91	1.343	0.804						.906				
PF3		4.99	1.242	0.812						.857				
SC1	0.628	3.51	1.393	0.915							-.904			
SC2		5.86	1.272	0.696						-.552				
SC3		3.35	1.213	0.918							-.916			
PO1	0.883	5.37	1.284	0.815								.866		
PO2		4.22	1.718	0.897								.929		
PO3		4.64	1.589	0.835								.849		
PNM1	0.789	5.34	1.340	0.71									.825	
PNM2		5.56	1.078	0.851									.906	
PNM3		5.71	1.182	0.73									.818	
INT1	0.929	4.44	1.335	0.82										.852
INT2		4.42	1.321	0.91										.934
INT3		4.52	1.317	0.846										.954

Note: PU = Perceived Usefulness, PEU = Perceived Ease of Use, PV = Price value, PE = Perceived Enjoyment, SI = Social Influence, PF = Perceived Information, SC = Social Concerns, PO = Personal Innovativeness, PNM = Perceived Need of Minimalism, INT = Intention to Adoption

Firstly, as we can see in Table 5, the value of Cronbach's Alpha for most constructs turns out to be quite high with Perceived Enjoyment (PE) and Intention to Adoption (INT) both are above 0.9 which represent an “Excellent” internal consistency. All the others are above 0.8 which indicate a “Good” internal consistency except for Perceived Need of Minimalism (PNM) with 0.789 and Social Concerns (SC) with 0.628. As mentioned before, the value above 0.7 is “Adequate” and above 0.6 means “Acceptance”. Therefore, all the constructs present a good reliability level.

Furthermore, the second and third columns show the average and Std. Deviation of the responses for each item. Perceived Ease of Use (PEU) shows the highest mean and with the lowest deviation, which means, respondents hold the similar positive opinion that using Plastic Card is clear and easy. Likewise, most of the value of extraction are above 0.8, seldom are above 0.7, and only two of them are around 0.6 (SI3 & SC2). Since all of them are greater than 0.6, which shows a close correlation between items, there is no need to delete any of them. In addition, factor loadings are quite clear and the value shows a high level of loading except for Social Concerns 2 (SC2). It loads to another factor with a negative low value, which gives an interpretation that this item fails in loading to the factor. In the meanwhile, the items of Social Concerns together show the lowest Cronbach's Alpha, SC2 has the highest average and second lowest extraction value. Hence SC2 can be regarded as the most problematic item. Usually a minimum number for item should be 3 for per hypothesized factor (Brewerton & Millward, 2001; Costello & Osborne, 2005) which is call the three-indicator rule (Hair et al., 2010), however, Kenny (2015) pointed out that, the two-indicator can also be an alternative sufficient condition. Hair et al. (2010) claimed that, the two-indicator factor also states a congeneric model as long as both items have significant factor loadings. More importantly, Habing (2003) empathized that researchers should ensure the items to load on each factor before discussing about the trust issue that how many number of items should be. For one thing, SC2 is not capable to load on the factor it is supposed to and the values of its' other indicators are too extreme. For another, two item will also be sufficient for this factor. Considering all the mentioned aspects, decision is made to delete the item SC2.

It is manifested in Table 6 that, there is no cross-loadings between factors any more after the modification (deleting SC2). The table illustrates a quite clean and clear factor structure in which the convergent and discriminant validity (will be mentioned in the following section) are also evident by the high loadings of each items. Furthermore, it is worth mentioning that,

the Cronbach's Alpha value of Social Concerns (SC) has been largely improved from 0.628 to 0.915. In conclusion, the modified model shows a high level of reliability.

Table 6 Modified Pattern Matrix

Pattern Matrix															
	Cronbach's Alpha	Mean	Std. Deviation	Extraction	PU	PEU	PV	PE	SI	PF	SC	PO	PNM	INT	
PU1	0.878	5.03	1.348	.814	.906	1.028									
PU2		5.24	1.039	.876	.937										
PU3		5.03	1.286	.823	.810										
PEU1	0.827	5.80	.912	.867											
PEU2		5.67	.928	.799											.700
PEU3		5.49	1.005	.750											.530
PV1	0.882	3.39	1.319	.807											
PV2		3.87	1.270	.843											.886
PV3		3.70	1.268	.850											.872
PE1	0.918	5.13	1.141	.875											
PE2		5.20	1.069	.827											1.00
PE3		5.11	1.143	.905											.821
SI1	0.81	4.38	1.325	.784											
SI2		4.14	1.319	.815											.742
SI3		3.75	1.597	.704											.753
PF1	0.868	4.80	1.281	.803											
PF2		4.91	1.343	.811											.870
PF3		4.99	1.242	.814											.898
SC1	0.915	4.49	1.393	.917											
SC3		4.65	1.213	.928											.850
PO1	0.883	5.37	1.284	.814											
PO2		4.22	1.718	.894											.870
PO3		4.64	1.589	.839											.898
PNM1	0.789	5.34	1.340	.713											
PNM2		5.56	1.078	.864											.850
PNM3		5.71	1.182	.751											.850
INT1	0.929	4.44	1.335	.839											
INT2		4.42	1.321	.927											.833
INT3		4.52	1.317	.851											.903

Note: PU = Perceived Usefulness, PEU = Perceived Ease of Use, PV = Price value, PE = Perceived Enjoyment, SI = Social Influence, PF = Perceived Information, SC = Social Concerns, PO = Personal Innovativeness, PNM = Perceived Need of Minimalism, INT = Intention to Adoption

4.1.3 Validity Assessment

Reliability as discussed in the former section refers to the consistency or stability of the data to which degree the measurement can be repeated and confirmed by further analysis (Rosnow & Rosenthal, 1999), and it is well measured by Cronbach’s alpha. While validity is defined as the correspondence between a factor and the operational procedure to manipulate the factor (Tiko, 2015), that is, to check whether the chosen measurement can actually measure what it is intended to do (Cahill, 2006). Two types of validity are generally discussed in EFA: convergent validity and discriminant validity. Convergent validity shows the ability of measurements items to capture a single factor and it can be verified when items within one factor have a high correlation with each other (Cahill, 2006). It is proved in the modified matrix that, all the items show highly loadings to the corresponding item, thus convergent validity is supported in EFA.

Discriminant validity, also known as divergent validity, refers to the degree to which one factor is different from the others (Hair et al., 2010). It assesses the ability of measurement items to distinguish between factors. The correlation matrix below are recommended to measure discriminant validity (Fornell & Larcker, 1981). According to Kline (2005), the value of correlation for factors greater than 0.85 is a serious measurement, it shows the fact that two factors are measuring the same thing. And the one below 0.7 is acceptable. The table below shows that all the values are less than 0.7 which proved discriminant validity.

Table 7 Component Correlation Matrix of EFA

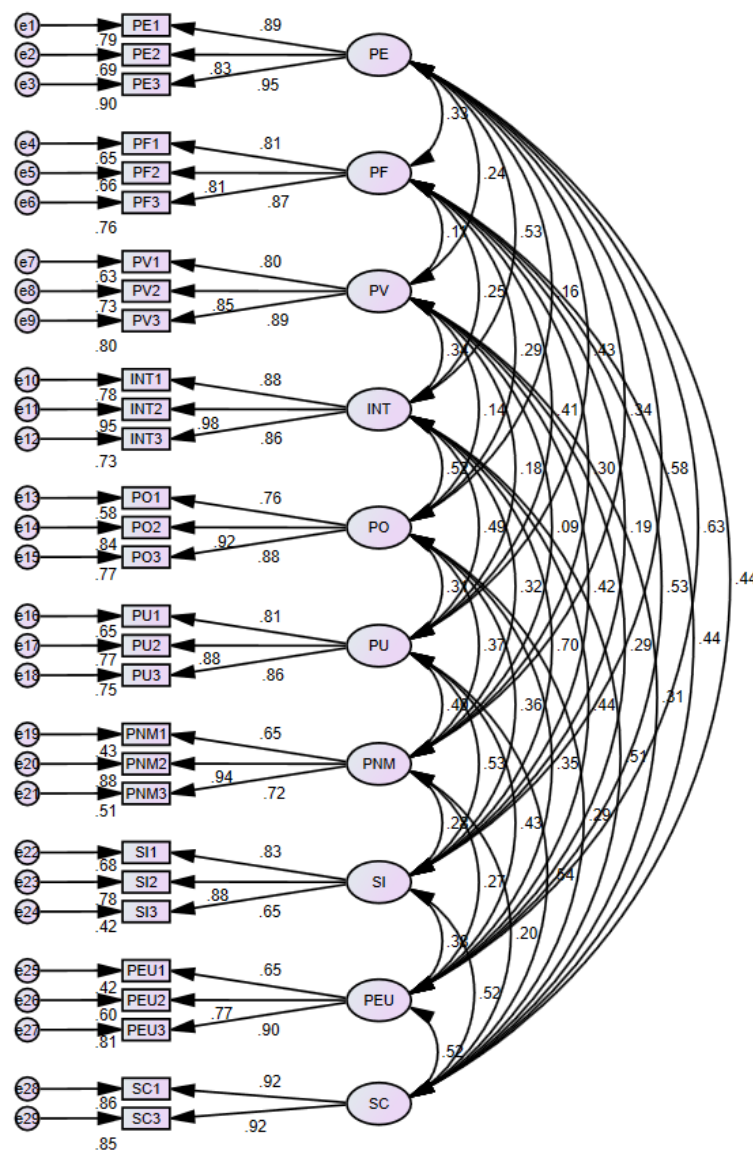
	Component Correlation Matrix										
	PU	PEU	PV	PE	SI	PF	SC	PO	PNM	INT	
Perceived Usefulness	1.00										
Perceived Ease of Use	.351	1.00									
Price Value	.214	.100	1.00								
Perceived Enjoyment	.505	.252	.331	1.00							
Social Influence	.190	.237	.110	.405	1.00						
Perceived information	.395	.323	.166	.433	.283	1.00					
Social Concerns	.242	.244	.059	.272	.334	.355	1.00				
Personal Innovativeness	.428	.125	.261	.531	.288	.427	.250	1.00			
Perceived Need of Minimalism	.485	.354	.242	.361	.316	.288	.170	.202	1.00		
Intention to Adoption	.412	.363	.264	.431	.247	.476	.175	.419	.357	1.00	

4.2 Confirmatory Factor Analysis

4.2.1 Measurement Model Development

The data was firstly modified and verified by EFA, afterwards, it will be imported into IBM Amos 23.0 for CFA procedure. The measurement model in SEM is evaluated through CFA. The figure below shows the initial model of CFA in which the rectangle represents observed variable, the circle represents latent variables, the two-headed arrow refers to the covariance, and the one-headed arrow indicates the unidirectional relationship.

Figure 11 The Initial Measurement Model



Note: PE = Perceived Enjoyment, PF = Perceived Information, PV = Price value, INT = Intention to Adoption, PO = Personal Innovativeness, PU = Perceived Usefulness, PNM = Perceived Need of Minimalism, SI = Social Influence, PEU = Perceived Ease of Use, SC = Social Concerns

The initial measurement model consists of 10 latent variables and each variable contains two to three indicator items which is represented by the questions in the survey in a 7-point likert scales. The values of standard factor loadings significantly range from 0.65 to 0.98. When it comes to model fit, Hair et al. (1998) recommended several indicators to evaluate the models. Included in this study are the Chi-Squared test, RMSEA, NFI, TLI, and CFI. Some researchers also added GFI and AGFI as model fit in their study, however, others argued that these measures are affected by sample size (Sharma, Mukherjee, Kumar & Dillon, 2005; Kenny, 2015). Considering the sample size in this study is not suitable for these two measurements, they are not adopted in the analysis. The model fit statistics of initial measurement model are listed in the following figure.

Table 8 Overall Model Fit for Initial Measurement Model

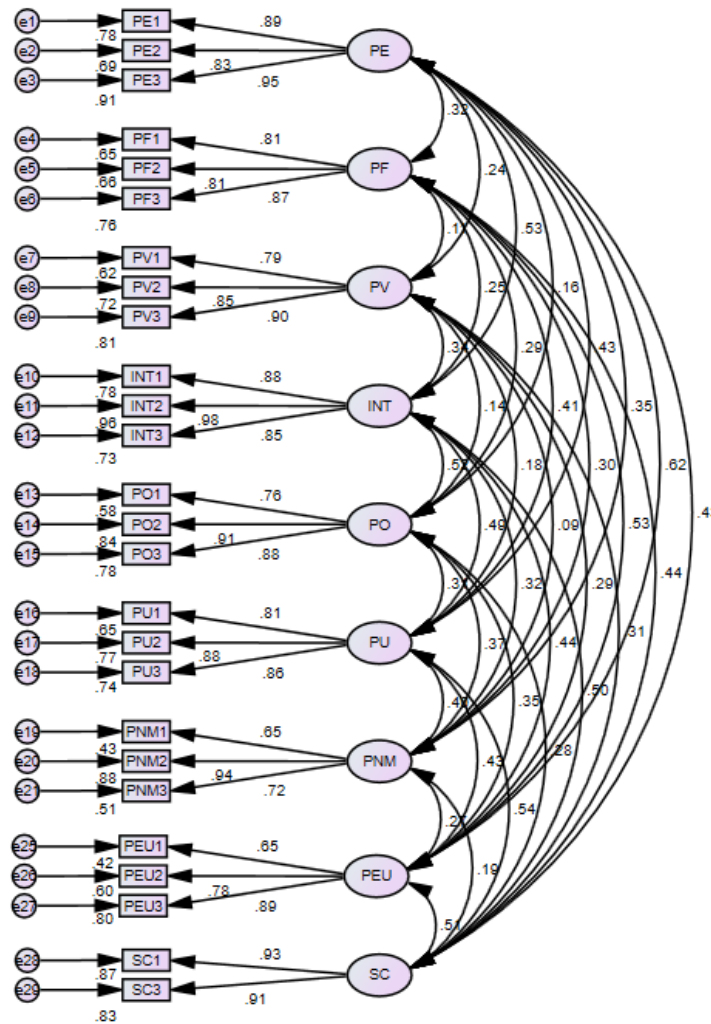
Model fit index	Good threshold levels	Initial measurement model
P value	>.05	.000
CMIN/DF	<3	1.428
RMSEA	<.07	.061
NFI	>.95	.826
TLI	>.95	.925
CFI	>.95	.939

P value is used for testing the hypothesis whether the model fits in the population. In the initial measurement model, p value is less than 0.05, which suggests that the model fitting is only acceptable. CMIN/DF is the value of the minimum discrepancy divided by its degrees of freedom (Kline, 2005). RMSEA stands for the Root Mean Square Error of Approximation, it is regarded to be the most popular measure of model fit (Kenny, 2015). NFI is the Normalized Fit and TLI is the Tucker-Lewis-index Non-formed, these two goodness of fit indices compare the model to the independence model, as such, NFI is the difference between two models' chi-squares divided by the chi-square for the independence model. CFI is the Comparative Fit Index, it uses a non-central chi-square approach to measure the distance between the (terribly fitting) independence model and the (perfectly fitting) saturated model (Bentler & Bonett, 1980). The value of CMIN/DF is 1.428 and RMSEA is 0.061, both are within the good threshold levels and indicate a good fit. The value of NFI, TLI and CFI are below the good levels therefore some model fit issues should be fixed according to this result.

In order to improve the model fit, two items of Social Influences should be removed based on the information from Modification Indices and the Residual Covariance on Amos output. However, many researchers have strongly insisted that the items of latent variables should not

be less than 3. Hair et al. (2010) emphasized that one-item factor cause the most problem with identification. In the meanwhile, combining the factor loading result in EFA, the Social Influence items tend to have the lowest factor loadings values, the decision has been made to delete the whole items of Social Influence. Therefore, the modified measurement model is shown below that 9 of the variables are measured again.

Figure 12 The Modified Measurement Model



Note: PE = Perceived Enjoyment, PF = Perceived Information, PV = Price value, INT = Intention to Adoption, PO = Personal Innovativeness, PU = Perceived Usefulness, PNM = Perceived Need of Minimalism, PEU = Perceived Ease of Use, SC = Social Concerns

The table below shows the new model fit statistics. After the modification, the model fit tend to be largely improved. The value of CMIN/DF is 1.340, RMSEA is 0.054, and CFI becomes .0957. TLI is .0946, which is very close to the good standard. Most of the values are within

the good threshold levels and indicate a good fit. The value of NFI has been improved to 0.852. Since it is above 0.7, it can be regarded as acceptable.

Table 9 The Overall Model Fit of the Modified Measurement Model

Model fit index	Good threshold levels	Initial measurement model
P value	>.05	.000
Chi-square/degree of freedom	<3	1.340
RMSEA	<.07	.054
NFI	>.95	.852
TLI	>.95	.946
CFI	>.95	.957

4.2.2 Reliability and Validity Assessment

The reliability of the modified measurement model is established by estimating the Composite Reliability (CR) and Max Reliability (H). Originally proposed by Fornell and Larcker (1981), CR is used to measure the construct reliability by drawing on the standardized loadings and measurement errors for each item. According to Fornell et al. (1981), CR is computed from the sum of factor loadings of each variable (λ_i) and the sum of the error variance terms for a variable. Similar to Cronbach's alpha, CR is regarded to be an acceptable threshold when the value is above 0.7. Comparing to CR, which represents the relation between the scale's underlying latent variables and the unit-weighted composite, Max Reliability (H) estimates the reliability of the scale's optimally weighted composite, Hancock and Mueller (2001) noted that H provides point estimates of a scale's reliability that CR cannot cover. The scale's reliability is evident when the value is significantly greater than a lower threshold 0.80. The following equation demonstrates the calculation (Fornell et al., 1981; Hancock et al., 2001).

$$CR = \frac{(\sum_{i=1}^p \lambda_i)^2}{(\sum_{i=1}^p \lambda_i)^2 + (\sum_{i=1}^p 1 - \lambda_i^2)} ; H = \frac{1}{1 + \frac{1}{\sum_{i=1}^p \frac{\lambda_i^2}{1 - \lambda_i^2}}}$$

The Convergent Validity and the Discriminant Validity of the modified measurement model are respectively established by estimating the Average Variance Extracted (AVE) and Maximum Shared Variance (MSV). AVE measures the level of variance captured by a construct compare to the level due to the measurement error. The value of AVE great than 0.5

indicates a good level of convergent validity, while discriminant validity is established by MSV when the value of MSV is lower than the AVE for all the constructs. AVE can be calculated by the equation below, λ_i is the factor loading and n stands for the number of observed variables. (Fornell et al., 1981; Hair et al., 2001)

$$AVE = \frac{\sum_{i=1}^n \lambda_i^2}{n}$$

Based on the theories explained before, the table below manifests the result of reliability and validity. As we can see, the CR statistics indicate a good composite reliability for all variables. In the meanwhile, H proves a great Max Reliability that all the variable values are above 0.08. AVE greater than .50 of all the 9 variables show a good convergence validity. Furthermore, all the 9 variables present the discriminant validity by the result that all the AVE values are greater than MSV. Besides, yet the correlation matrix from CFA is slightly different from EFA, the result of both CFA and EFA present a good level of discriminant validation which of all the values loading to other variables are less than 0.7. Therefore, combining with the good model fit indices, the measurement model is proved to be of reliability and validity in statistics and indicates a convincing result for the continuous measurement of structural model.

Table 10 Reliability and Validity Results

	CR (>0.7)	MaxR(H) (>0.8)	AVE (>0.5)	MSV (<AVE)	PEU	PE	PF	PV	INT	PO	PU	PNM	SC
PEU	0.821	0.861	0.608	0.389	0.780								
PE	0.919	0.956	0.792	0.389	0.624	0.890							
PF	0.869	0.966	0.689	0.279	0.528	0.323	0.830						
PV	0.884	0.974	0.718	0.116	0.293	0.239	0.110	0.848					
INT	0.933	0.985	0.824	0.277	0.440	0.526	0.249	0.340	0.908				
PO	0.890	0.987	0.731	0.266	0.354	0.164	0.292	0.140	0.516	0.855			
PU	0.886	0.988	0.722	0.288	0.428	0.430	0.415	0.179	0.491	0.313	0.850		
PNM	0.819	0.990	0.607	0.157	0.270	0.345	0.299	0.092	0.318	0.367	0.396	0.779	
SC	0.920	0.991	0.852	0.288	0.512	0.433	0.441	0.312	0.501	0.283	0.537	0.194	0.923

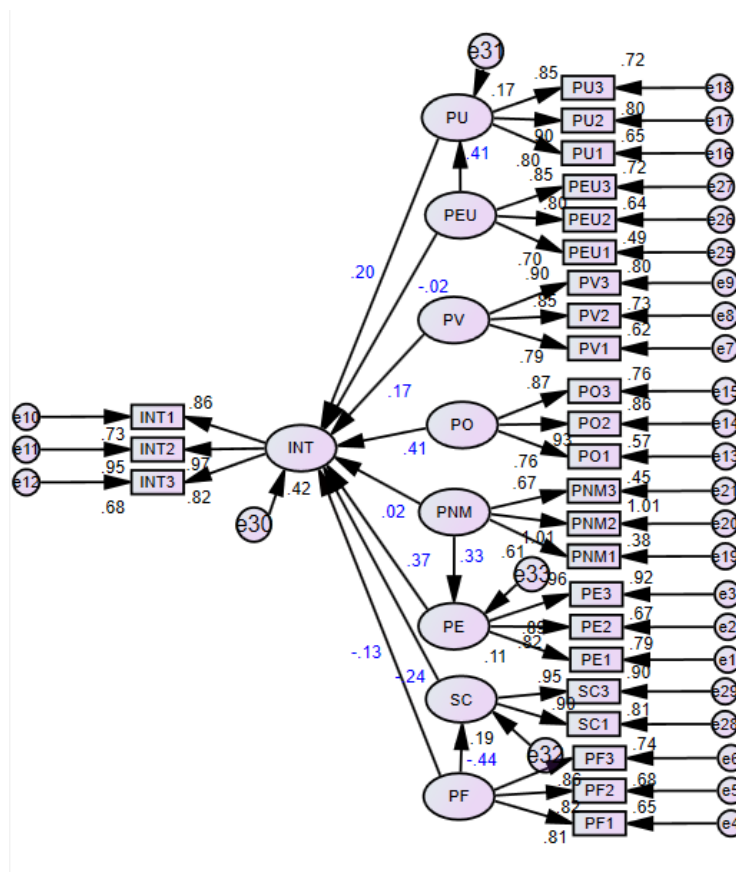
Note: PEU = Perceived Ease of Use, PE = Perceived Enjoyment, PF = Perceived Information, PV = Price value, INT = Intention to Adoption, PO = Personal Innovativeness, PU = Perceived Usefulness, PNM = Perceived Need of Minimalism, SC = Social Concerns

4.3 Structural Model Evaluation

4.3.1 Structural Model Assessment

After conducting the measurement model assessment, the corresponding structural model is obtained through Amos and the output is shown as follows.

Figure 13 Final Structural Model



Note: PU = Perceived Usefulness, PEU = Perceived Ease of Use, PV = Price value, PO = Personal Innovativeness, PNM = Perceived Need of Minimalism, PE = Perceived Enjoyment, SC = Social Concerns, PF = Perceived Information

Since the item 2 of Social Concerns was deleted in EFA process and the all three items of Social Influence were deleted in the process of model fit adjustment, there are 9 variables and 26 items left for the final structural model assessment. The final model is acceptable not only because of the high values of factor loadings of each items on the variables shown in figure 14 but also based on the model fit indices in the following table. Due to the limited sample size and the complexity of the structural model, the final model fit indices might not show a perfect match for each standard, however, NFI, TLI and CFI are all above 0.7 which indicate an adequate level and acceptable result.

Table 11 The Overall Model Fit of the Final Structural Model

Model fit index	Good threshold levels	Initial measurement model
Chi-square/degree of freedom	<3	1.823
RMSEA	<.07	.082
NFI	>.95	.779
TLI	>.95	.870
CFI	>.95	.884

4.3.2 Hypotheses Test

After all the reliability and validity operations and model fit adjustments, both EFA and CFA demonstrated good measurement model, and SEM indicated an acceptable structural model. Thus it is time to examine the relationship of the theoretical model by checking the hypotheses established in the literature review section. As it's shown in the table below, 4 out of 12 hypotheses were not supported, they are the perceived Ease of Use (H2a), Social Influence (H5), Perceived Need of Minimalism (H6a), and Perceived Information (H9a) to positively influence the behavior intention to adoption of Plastic Card.

Table 12 Hypotheses Results

	Standardized Estimates	P	Results
H1 : PU → INT	.199	.030	Supported
H2a : PEU → INT	-.023	.807	Not Supported
H2b : PEU → PU	.408	***	Supported
H3 : PV → INT	.172	.034	Supported
H4 : PO → INT	.413	***	Supported
H5 : SI → INT	N/A	N/A	Not Supported
H6a : PNM → INT	.034	.655	Not Supported
H6b : PNM → PE	.331	***	Supported
H7 : PE → INT	.366	***	Supported
H8 : SC → INT	-.242	.008	Supported
H9a : PF → INT	-.133	.154	Not Supported
H9b : PF → SC	-.440	***	Supported

Note: PU = Perceived Usefulness, PEU = Perceived Ease of Use, PV = Price value, PO = Personal Innovativeness, SI = Social Influence, PNM = Perceived Need of Minimalism, PE = Perceived Enjoyment, SC = Social Concerns, PF = Perceived Information, INT = Intention to Adoption

Among the factors that were hypothesized in the conceptual model to directly influence behavioral intention: Perceived Usefulness had a positive effect on users' intention ($\beta=.199$; p-

value=.030), Price Value had a positive effect on users' intention ($\beta=.172$; p-value=.034), Personal Innovativeness had a positive effect on users' intention ($\beta=.413$; p-value<.001), Perceived Enjoyment had a positive effect on users' intention ($\beta=.366$; p-value<.001), Social Concerns had a negative effect on users' intention ($\beta=-.242$; p-value=.008), as such, H1, H3, H4, H7 and H8 were supported.

Among the factors that were hypothesized in the conceptual model to indirectly influence behavioral intention: Perceived Ease of Use had a positive effect on Perceived Usefulness ($\beta=.408$; p-value<.001), Perceived Need of Minimalism had a positive effect on Perceived Enjoyment ($\beta=.331$; p-value<.001), and Perceived Information had a negative effect on Social Concerns ($\beta=-.440$; p-value<.001). Accordingly, H2b, H6b, H9b were supported.

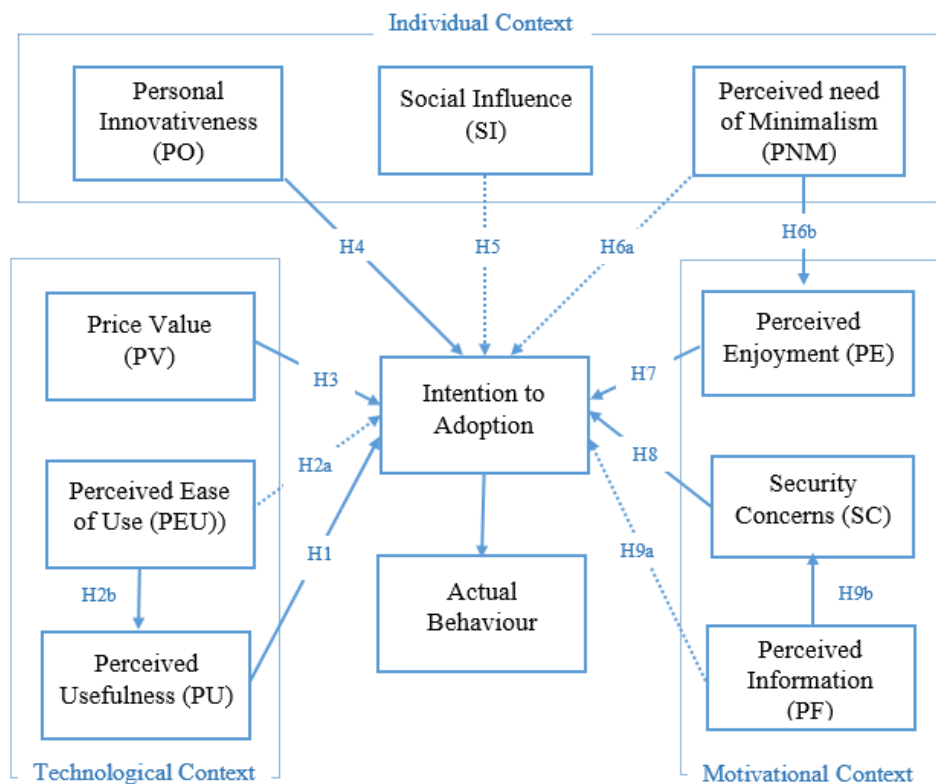
5 Conclusions

This chapter starts with the discussion of empirical results and findings from the feedback of questionnaires, thereafter, theoretical contribution is clarified and practical implications is presented in accordance with the three different contexts: the technological context, individual contexts and the motivational contexts, to provide practical suggestions for the case company Plastic and similar FinTech start-ups, and then limitations and suggestions for further Research are concluded to finalize the research.

5.1 Discussion

This section will analyze the result for each variables. As we can see in the final research model below, not all latent constructs are consistent with the literature introduced in earlier chapters. Rather, Social Influence (SI) was dropped in the data analysis procedure; Perceived Ease of Use (PEU), Perceived Need of Minimalism (PNM), and Perceived Information (PI) were found to have no direct relationship with Intention to Adoption (INT), instead, they all influenced INT through another construct in an indirectly way.

Figure 14 Research Model with Hypotheses Results



Personal Innovativeness turned out to be the most positive influential factor on users' intention ($\beta=.413$; $p\text{-value}<.001$), the result conforms to the features of Plastic Card. As an emerging technology, the most outstanding characteristics are the novelty and uniqueness, which to some extent are equal to unknown and uncertainty. Only when consumers got confident enough to face the unknown and uncertainty can they be willing to adopt Plastic Card. Individuals with higher personal innovativeness levels are tend to be more optimistic with Plastic Card and more self-confident in adopting it, this was consistent with Kegerreis et al. (1970), Xu et al. (2009), and Saprikis et al. (2010).

Perceived Enjoyment was the second influential factor positively affecting users' behavior intention ($\beta=.366$; $p\text{-value}<.001$). In a sense, Plastic Card cannot be deemed as the necessities of life. Rather, it is an intelligent payment solution that satisfies individuals' needs of a more convenient and enjoyable lifestyle, thereby it is particularly important for individuals to perceive enjoyment as an additional value in using Plastic Card. This also accorded with the descriptions in psychological theories that individuals may engage in a particular behaviour because of its inherent enjoyment (Deci et al., 1985). The result verified Moon et al's (2001) assertion that the curiosity and enjoyment had a positive impact on the intention to use high technology.

Security Concerns was found to be the third influential factor which affected users' intention negatively ($\beta=-.242$; $p\text{-value}=.008$). The result was consistent with many related studies (Suh et al., 2003; Roboff et al., 1998; Pavlou et al., 2007). This can be explained with the fact that Plastic Card as a typical FinTech involves a lot of sensitive information that individuals might hesitate to provide. Any anxiety or suspicion in the company's ability and willingness to safeguard their monetary information from security breaches such as hackers during the transmission and storage process will impede the individuals behaviour intention to accept Plastic Card. Presumably, Security Concerns would be an obstacle in accepting FinTech.

Perceived Usefulness was the fourth influential factor positively affecting users' behavior ($\beta=.199$; $p\text{-value}=.030$). It was the construct verified by a substantial studies in FinTech fields (Pikkarainen et al., 2004; Eze, et al., 2011; Guriting et al., 2006) and got confirmed as well by this research. Compare to Perceived Enjoyment, Perceived Usefulness seemed to be less influential, this agreed with Teo et al.'s (1998) research that new users tend to feel the enjoyment and be fascinated by the capabilities of the system in the initial stage, later on, the continued usage is largely decided by the Perceived Usefulness. Perceived Enjoyment in this

research turned out to have bigger influence than perceived usefulness, as such, it was in accordance with the assumption proposed in Teo et al.'s (1998) research that Perceived Enjoyment affects the decision to begin the use while Perceived Usefulness affects the decision for the length of using.

Price Value was found to positively affect users' behavior intention ($\beta=.172$; $p\text{-value}=.034$). Consequently, it was evident in this research that the perceived benefits are greater than the monetary cost at the current price of Plastic Card, which can be a good start. Considering the background of the respondents, they are mostly students with high education level. Therefore, when it comes to individuals with high salaries, the price will be more of value. Plastic Card, as a bridge between traditional payment card and complete digital technology, has adopted the latest technologies such as e-ink, rewriteable RFID/ NFC, rewritable magnetic stripe, wireless charging and so on, therefore, individuals feel it worth the price. The perceived price value successfully enhanced consumers' intention to purchase in this research thus it was consistent with the past studies (Grewal et al., 1998; Pura, 2005; Wu et al., 2005).

Perceived Information was not proved to have the direct relationship with users' behaviour intention. However, it was verified to affect Social Concerns ($\beta=-.440$; $p\text{-value}<.001$) and hence, Perceived Information indirectly influenced the users' behaviour intention. This implied that, the amount of information reached to individuals will not make a difference, whereas the information clarifying security issues will play a significant role. The negative relationship between Perceived Information and Security Concerns illustrated that the more information an individual gets, the more feeling of control they obtain and thus the less he or she would concern about the uncertain security issues, which was in accord with Pavlou et al. (2007), Suh et al.(2003), and Gupta et al. (2010).

Perceived Need of Minimalism as a new latent variable proposed in this research was not proved to be influential in affecting users' behavior. The reasons might be not only with regard to the average amount of cards the respondents currently own (40% of respondents have only 0 to 5 cards), but also in terms of the reality that almost all the respondents reported they prefer the minimalism lifestyle (the mean of the three items is 5,54, between “somewhat agree” and “agree”). Since many of the respondents don't have that many cards, they already got the simplified life in this sense, and many of them agreed to the minimalism lifestyle, it makes sense that the link between PNM and behavior intention was not significant. Nevertheless, PNM was found to have a positive effect on Perceived Enjoyment ($\beta=.331$; $p\text{-value}<.001$), thus

we can conclude that the more an individual needs for minimalism, the more likely he or she will think it is enjoyable when using Plastic Card and hence the more likely he or she would adopt it.

Perceived Ease of Use, as one of the most critical factors in acceptance research within information system domain, has been examined and confirmed by many studies (Davis, 1989; Wu et al., 2005; Fagan et al., 2008; Zhong et al., 2013; Smith et al., 2014). However, the direct influence to behavior intention was not supported in this research. It is worth noting that PEU turned out to have the highest mean (5.65) and the lowest variance, which implicated that most individuals hold the same view towards this variables and their responses to the three items had the least difference. Individuals in Finland have long been accustomed to using smart card in everyday life, whereas Plastic Card is similar to smart card, it would be easy for the experienced users to learn how to use it. Consequently, the direct relationship was not evident in this context. In accordance to the past studies, Perceived Ease of Use had a positive effect on Perceived Usefulness ($\beta=.408$; $p\text{-value}<.001$), this supported the view of many studies (Rigopoulos et al., 2007; Fagan et al., 2008; Prompattanakdee, 2009; Safeena, et al., 2011)

Social Influence was removed in order to improve the model fit in confirmatory factor analysis. Since two items of Social Influences should be dropped according to the information from Modification Indices and the Residual Covariance of Amos output. However, Hair et al. (2010) emphasized that the one-item factor will cause the most problem with identification. In the meanwhile, considering the lowest factor loading result in EFA, all three Social Influence items were deleted. Even though Social Influence has been verified in many studies to be positively influential in behavior intention (Wu et al., 2005; Wei, 2009; Wu et al., 2012; Kim, et al., 2015), this study in FinTech indicated no relationship. This case also happened in Qeisi and Abdallah's (2013) research, Social Influence variable got removed during their data analysis process and they explained that, with gained experience, the impact of social influence tended to be weaker than in the initial stage, this view was also supported by Taylor et al. (1995) and Venkatesh et al. (2003).

5.2 Findings

Although it was not required, some of the respondents sent feedback in person after answering the questionnaire. As such, they can be classified into individuals with relatively high interests, or perhaps future buyers. These respondents can be divided into three groups according to their feedback. The first group is the **active buyer** who kept telling about their excitement and curiosity on Plastic Card and asserted that they would order one if it works in Europe. Their messages were like *“Never got the chance to know this, would be so much fun to use it and so useful to me since I have more than 20 cards”*; *“Very excited about this, very useful to me, thank you for your information, already ordered”*. The second group is the **positive buyer** with high security concerns who claimed that their only uncertainty is the security issue and would like to adopt it if the card can be somehow proved to be safe. Their messages were like *“I would like to use it but I am worried about the security, it’s risky to offer all the information to that company”*; *“I don’t worried about losing the card yet, I just don’t trust this company, unless someone told me he is using it and its safe”*. The Third group is the **potential buyer** who were sensitive to the price, they strongly expressed their desires to order the card but cannot stop complaining about the price. Besides the initial price, there is an additional subscription fee necessary to continue using Plastic Card, thus many respondents thought it would be a burden. Their messages were like *“I would order it immediately if the price can be half of the current one”*; *“I really need it but I really cannot afford it! Besides the selling price, there is also the subscription fee, why is that?”*; *“Believe it or not, the current price will not work, there is a big chance the price would be lower in the future, and that would be the perfect time to order. I will wait for that time”*

Interestingly, the feedback to some extent also in consistent with the hypotheses result. Active buyers emphasized the Perceived Usefulness and Perceived Enjoyment, which were proved to be evident in affecting behavior intentions. Positive buyers pointed out the Security Concerns to be an important information, which was also reflected to be a negative factor. Price Value was verified to be positively related to user intention, whereas the potential buyers didn’t agree on this view. Another finding was that, one feedback mentioned that the answering time of the questionnaire might also influence the result: *“I usually have no patient in weekdays but if you send the survey on weekends, I will definitely spend more time to think of it and answer it carefully.”* These gives a hint that, online promotion of innovative technology products should be released around weekends while people on internet with more relaxing mood.

5.3 Theoretical Contribution

In a theoretical point of view, this research contributed to the past studies in several ways. Firstly, the four models adopted in this study, Technology Acceptance Model (TAM), Motivational Model (MM), Unified Theory of Acceptance and Use of Technology (UTAUT), and Adoption of Risky Technologies (ART), were adapted into a disruptive context for FinTech research. A new conceptual model was proposed specifically for FinTech product based on these four models.

Secondly, this research further validated many variables in a new domain (FinTech), and the results supported many of the past studies: Personal Innovativeness (Kegerreis et al., 1970 ; Xu et al., 2009; Saprikis et al., 2010), Perceived Enjoyment (Moon et al., 2001), Security Concerns (Suh et al., 2003; Roboff et al., 1998; Pavlou et al., 2007), Perceived Usefulness (Pikkarainen et al., 2004; Eze, et al., 2011; Guriting et al., 2006), and Price Value (Grewal et al., 1998; Pura, 2005; Wu et al., 2005).

In addition, the new variable Perceived Need of Minimalism was found to have a positive effect on Perceived Enjoyment and hence indirectly influenced the behavior intention. And the relationship between variables was proved to be in accordance with the assumption proposed in Teo et al.'s (1998) research: Perceived Enjoyment mainly affects the decision to start the use while Perceived Usefulness mainly affects the decision for how long will users actually use it.

Furthermore, this research shed new light on the variable of Perceived Information. The amount of information didn't show significant influence on behaviour intention, instead, the more information the users attained, the fewer security concerns will they feel. As such, the information plays an indirect role in affecting users' intentions by affecting security concerns (Pavlou et al., 2007; Suh et al., 2003; Gupta et al., 2010).

Besides, this research confirmed the view that with gained experience, the impact of some variables tended to be weaker than in the initial stage (Taylor et al., 1995; Venkatesh et al., 2003), in this research, they were Perceived Ease of Use, Social Influence and Perceived Need of Minimalism. Perceived Ease of Use had a positive effect on Perceived Usefulness, this supported the view of many past studies (Rigopoulos et al., 2007; Fagan et al., 2008; Prompattanapakdee, 2009; Safeena, et al., 2011). The newly prosed variable Perceived Need of Minimalism was found to have a positive effect on Perceived Enjoyment.

5.4 Practical Contribution

5.4.1 Suggestions in Technological Context

Theoretically based on TAM and UTAUT, technological context focuses on the inherent characteristics of FinTech, among which Perceived Usefulness (PU) and Price Value (PV) were found to have direct influence on behaviour intention while Perceived Ease of Use (PEU) was found to indirectly affect behaviour intention through Perceived Usefulness (PU). Based on the product itself, suggestions can be proposed as follows.

Firstly, the usefulness of Plastic Card should be amplified also on other smart cards. The current slogan on the website is “*Bring intelligence to the way you pay with Plastic Card*”, whereas the usefulness is not merely limited in payment cards. Likewise, the main technologies such as *contactless NFC, contact EMV, magnetic stripe, and barcode* employed in Plastic Card can largely enable and enhance the substitution of a lot of other contactless cards (entrance card, gym card, travel card, loyalty card). Therefore, the more functionalities get introduced and promoted, the more likely the users will adopt it.

Secondly, a more flexible and realistic price strategy can be applied in this case. The present strategy is to provide pre-order price 150 dollars together with the free lifetime subscription and a two-year warranty and afterwards the retail price will be raised up to 180 dollars with 50 dollars subscription each year. In order to increase the value of price, more discrimination pricing strategies could be adopted in this case. For instance, a return cash will be provided when the customer can introduce another buyer, students share a certain discount since they don't have income, and offering group purchasing discount to encourage buyers order together.

Thirdly, the company should pay more attention to the website analytics to attract more consumers. On account of the fact that plasct.com website is the only market channel which brings all the business, the manger should spare no effort to convert the viewers into the actual buyers. It is asserted that the application of big data can really make a difference in the age of information explosion since the time of viewing, bounce rate, and other website indicators can contribute to improve the attractiveness of the website and convince the viewers to actually buy the product. Hence the company can use Google Analytics or other data analysis tools to measure and track the website data and make effort to convert the viewers into buyers.

5.4.2 Suggestions in Individual Context

Theoretically based on RTA, individual context focuses on the personal awareness and aims at defining the target group for Plastic Card. According to the research result, Personal Innovativeness (PO) was the most influential factor affecting behavior intention, Social Influence (SI) was not supported to have influence in actual intention, and Perceived Need of Minimalism (PNM) was found to directly influence perceived enjoyment and therefore directly influence the behavior intention, which might implicate that, the target group or potential early adopters of Plastic Card are a group of innovative individuals who would like to try new things and might also be a minimalist.

Taking part in the well-known innovative technology competition would be a good chance to catch innovative individuals' eyes. For one thing, the host of the competition would make attempts to largely promote the information of promising participants, which can be regarded as another propaganda way. For another, the audiences are usually composed of investors, journalists, and innovative individuals, thus regardless of the competition result it is a good time to gain investments, reports, and fame.

Another possible way to reach as many innovative individuals as possible is to post messages in all kinds of consumer technology websites or forums. The related information and the demonstration video can be widely distributed together with a link directs to the company website. In the meanwhile, inviting the famous journalists from prestigious media to write viewing reports and assessment articles is also an effective way to reach innovation individuals, which might arouse the curiosity of readers and also generate a discussion of the product and hence enlarge the popularity.

On the other hand, in order to attract possible minimalists' users, except for posting information on the specific websites and forums, the most well-known minimalists can be invited to use Plastic Card. It is obvious that they would play the leading role to attract the other pursuers of minimalism to start the use of Plastic Card and therefore to increase the sales and create a unique image of minimalism.

5.4.3 Suggestions in Motivational Context

Theoretically based on MM, motivational context focuses on the incentives of users' behaviour intention. Perceived Enjoyment (PE) was found to have positive direct influence on behaviour intention, Security Concerns (SC) indicated a negative influence on intention, and Perceived Information (PI) was found to have a positive indirect influence on behaviour intention through negatively influencing Security Concerns. This context emphasizes the possible highlights during the promotion process.

In consistent with Deci et al's (1985) assertion that individuals may engage in a particular behaviour because it is inherently interesting or enjoyable, this research verified individuals might adopt technology because it is interesting or enjoyable. As the second influential factor positively affecting users' behavior intention, perceived enjoyment should be largely emphasized in the promotion. It is of great importance to demonstrate the enjoyable aspects of Plastic Card itself, as well as the hedonic benefits of using it. A short interesting video would be a good option to convince individuals and increase their enthusiasm.

Gupta et al. (2010) noted that the effect of control is stronger than the effect of risk, more precisely, regardless of the potential risk, the adoption rate will increase on condition that customers feel themselves in control of their transaction. Therefore, in order to minimize individuals' security concerns and reduce the negative impact of it as much as possible, Plastic can collaborate with authoritative banks and financial institutions. For one thing, the reliable image of authoritative banks and financial institutions can be imperceptibly transferred into Plastic, for another, individuals are familiar with authoritative banks and financial institutions and hence they would feel themselves in control of their transaction,

Besides, it was evident in this research that the amount of information didn't show direct impact on consumer behavior intention, instead, the amount of information would decrease the security concerns of the individuals and then increase the intention to actual behavior. The result implicated that, the myriad of miscellaneous messages would not make much difference. However, the targeted information which can educate consumers to have better awareness towards security issues would play a vital role. Information illustrated on the website should strongly focus on security concerning aspects and elaborate all the possible misgivings for the viewers.

5.5 Limitations and Further Research

This research was designed to explore the major factors affecting the acceptance of Plastic Card in Finland. The primary purpose is to find out the possible variables which affect users' adoption rate in terms of the unique features of FinTech products, the second purpose is to propose a conceptual research model based on consumer acceptance theories from information system field, and the third purpose is to provide practical suggestions for the case company Plastic and similar FinTech start-ups according to the research results.

There are several limitations associated with this research design that could be avoided in the future study: The first one is the sample size. This research has collected a sample data of 117 respondents living in Finland. Considering the amount of variables and the complexity of the conceptual model, this sample size just provided an adequate power of hypotheses testing. And that is the reason some of the model fit statistics didn't meet the good level. In order to improve the ability of data interpretation in the empirical framework, a larger sample size should be achieved. The second limitation is the pervasiveness of sample. This research is held in Helsinki region, however, when it comes to a boarder population, a more generalizable representative sample data should be reached.

Further research is needed to analyze the impact on the acceptance with a boarder group so as to avoid regional bias. Nine variables was chosen in this research and under each variable there were three items to measure the corresponding latent variables, for future research, more items should be set under each latent variables. In the meanwhile, no background variables were taken into consideration as mediates in this research, therefore, further research is suggested to consider more about the influence of respondents' background. Besides, Social Influence variable was dropped during the data analysis procedure, for future studies, this variable is recommended to get further analysis.

References

- Agarwal, R., & Prasad, J. (1998). A conceptual and operational definition of personal innovativeness in the domain of information technology. *Information Systems Research*. Vol.9, No. 2, 204-215.
- Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*. Vol.50, No. 2, 179-211.
- Ajzen, I., & Fishbein, M (1980). Understanding attitudes and predicting social behavior, *Englewood Cliffs, Englewood Cliffs. New York*.
- Amoroso D.L. & Magnier, W. R., (2012). Building a research model for mobile wallet consumer adoption: The case of Mobile Suica in Japan. *Journal of Theoretical and Applied*. Vol. 7, No.1, 94-110.
- Andrew, D.P. S, Pedersen, P. M., & McEvoy, C., D. (2011). Research Methods and Design in Sport Management. *Human Kinetics. Business & Economics*. 202-203
- Ayesha. (2009). Available at: <http://mobile-mania11.blogspot.fi/2009/02/mobile-payments-were-first-trialled-in.html>, [15.05.2016]
- Bagozzi, R.P. (2007). The Legacy of the Technology Acceptance Model and a Proposal for a Paradigm Shift. *Journal of the Association for Information Systems*. Vol. 8, No. 4, 244–254.
- Bandura, A. (1986). Social Foundations of Thought and Action: A Social Cognitive Theory. *Prentice Hall, Englewood Cliffs, NJ*.
- Bentler, P.M. and Bonnet, D.C. (1980). Significance Tests and Goodness of Fit in the Analysis of Covariance Structures. *Psychological Bulletin*. Vol. 88, No.3, 588-606.
- Boden, R. (2015). Finnish banks add HCE payments to Pivo mobile wallet. Available at: <http://www.nfcworld.com/2015/03/16/334586/finnish-banks-add-hce-payments-to-pivo-mobile-wallet/>, [15.05.2016]
- Bollen, K. A. (2014). Wiley Series in Probability and Statistics: Structural Equations with Latent Variables (1st Edition). *Somerset, US: Wiley-Interscience. ProQuest ebrary*.
- Brewerton, P. M., & Millward, L. J., (2001). Organizational Research Methods: A Guide for Students and Researchers. *Sage*. 149-155.
- Byrne, B. M. (2010). Structural equation modeling with AMOS, (2nd edition.). *New York: Routledge*.
- Cahill, D. L. (2006). Customer Loyalty in Third Party Logistics Relationships: Findings from Studies in Germany and the USA. *Springer Science & Business Media*. 124-133.

- Capgemini, (2015). World Payment Report 2015. Available at: https://www.fr.capgemini-consulting.com/resource-file-access/resource/pdf/world_payments_report_2015_vfinal.pdf, [15.05.2016]
- Chau, P. and Hu, P. (2002). Examining a Model of Information Technology Acceptance by Individual Professionals: An Exploratory Study. *Journal of Management Information Systems*, Vol.18, No. 4, 191-229.
- Chuttur M.Y. (2009). Overview of the Technology Acceptance Model: Origins, Developments and Future Directions. Indiana University, USA. *Sprouts: Working Papers on Information Systems*. Vol.9, No. 37, 1-19.
- Clark, S. (2014). Elisa offers NFC payment stickers in stores. Available at: <http://www.nfcworld.com/2014/04/09/328640/elisa-offers-nfc-payment-stickers-stores/>, [15.05.2016]
- Costello, A. B., & Osborne, J. (2005). Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis. *Practical Assessment Research & Evaluation*, Vol. 10, No.7.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology, *MIS Quarterly*. Vol.13, No. 3. 319-340.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*. Vol.35. 982-1003.
- Davis, F. D., Bagozzi, R., P., & Warshaw, P., R. (1992). Extrinsic and Intrinsic Motivation to Use Computers in the Workplace. *Journal of Applied Social Psychology*. Vol. 22, No.14, 1111-1132.
- Deci, E. L., & Ryan, R. M., (1985). Intrinsic Motivation and Self- Determination in Human Behavior. *Plenum, New York*.
- Eink (2016). Available at: <http://www.eink.com/technology.html>, [15.05.2016]
- Eze, U. C., Manyeki, J. K., Yaw, L. H., & Har, L. C. (2011). Factors Affecting Internet Banking Adoption among Young Adults: Evidence from Malaysia. *International Conference on Social Science and Humanity*. Vol.5, No. 5. 377-381.
- Fagan, M. H., Neill, S., & Wooldridge, B. R. (2008). Exploring the Intention to Use Computers: An Empirical Investigation of the Role of Intrinsic Motivation, Extrinsic Motivation, and Perceived Ease of Use. *Journal of Computer Information Systems*. Vol. 48, No. 3, 31-37.
- Faulkner, C. (2015). What is NFC? Everything you need to know. *Techradar.com*. Available at: <http://www.technovelgy.com/ct/Technology-Article.asp?ArtNum=1>, [15.05.2016]

- Fornell, C., & David, F. L. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*. Vol.18. No.1, 39-50.
- Gach, R., Gotsch, M. (2014). The Rise of Fintech Investment-New York's Opportunity for Tech Leadership. Available at: <http://www.slideshare.net/bpcga/fintech-is-booming-and-will-continue-to-do-so>, [15.05.2016]
- Gefen, D., & Straub, D.W. (2000). The Relative Importance of Perceived Ease of Use in IS Adoption: A Study of E-Commerce Adoption. *J. AIS*. Vol. 1, No. 8, 1-30.
- George, D. & Mallery. (2000). SPSS for windows step by step: a simple guide and reference. (3rd edition). *Allyn & Bacon*.
- Ghiciuc, I. (2016). Mobile Payment Apps – A Fresh Perspective on Online Finances. Available at: <http://www.thinslices.com/mobile-payment-apps/>, [15.05.2016]
- Goeke L. & Pousttchi K. (2010). A scenario-based analysis of mobile payment acceptance. In Proceedings of the Ninth International Conference on Mobile Business. *The Ninth Global Mobility Roundtable*. 371-378.
- GORSUCH, R. L. (1983). Factor Analysis (2nd edition). *Hillsdale: Lawrence Erlbaum Associates*.
- Grewal, D., Monroe, K.B., & Krishnan, R. (1998). The effects of price-comparison advertising on buyers' perceptions of acquisition value, transaction value, and behavioral intentions. *Journal of Marketing*. Vol. 62, 46-59.
- Gulamhuseinwala, I., Bull, T., & Lewis, S. (2015). "FinTech is gaining traction and young, high-income users are the early adopters", *EY Global Financial Services Institute Winter*, Vol. 3, No. 3, 5-17.
- Gupta, S., & Xu, H. (2010). Examining the Relative Influence of Risk and Control on Intention to Adopt Risky Technologies. *Journal of Technology Management & Innovation*. Vol. 5, No.4. 23-33.
- Guriting, P., and Ndubisi, N.O. (2006). Borneo online banking: Evaluating customer perceptions and behavioural intention. *Management Research News*. Vol. 29, 6-15.
- Gurski, D. (2014). Customer experiences affect customer loyalty: an empirical investigation of the starbucks experience using structural equation modelling. *Hamburg, Germany: Anchor Academic*. 15-20.
- Habing, B. (2003). Exploratory Factor Analysis. *University of South Carolina*. Available at: <http://people.stat.sc.edu/habing/courses/530EFA.pdf>, [15.05.2016]
- Hair, J. B. W., Babin, B., & Anderson, R. (2010). Multivariate data analysis (7th edition). *Prentice-Hall, Inc. Upper Saddle River, NJ, USA*.

- Hair, J.F. Jr., Anderson, R.E., Tatham, R.L., & Black, W.C. (1998). *Multivariate Data Analysis*, (5th Edition). *Upper Saddle River, NJ: Prentice Hall*.
- Hamburger, E. (2014). Plastic wants to replace your entire wallet with a single card. *The Verge*. Available at: <http://www.theverge.com/2014/10/7/6926669/plastic-wants-to-replace-your-entire-wallet-with-a-single-card>, [15.05.2016]
- Hancock, G. R., & Mueller, R. O. (2001). Rethinking construct reliability within latent variable systems. *Scientific Software International*.
- Hayashi, F., (2012). Mobile payments: What's in it for consumers? *Federal Reserve Bank of Kansas City*.
- Hofstede, G. (1984). *Culture's Consequences*. Abridged edition, Sage Publications, Beverly Hills.
- Hoyle, R. H. (2012). *Handbook of Structural Equation Modeling*. Guilford Press. 363-378.
- Hurley, A. E., Scandura, T. A., Schriesheim, C. A., Brannick, M. T., Seers, A., Vandenberg, R. J., Williams, L. J. (1997). Exploratory and confirmatory factor analysis: guidelines, issues, and alternatives. *Journal of Organizational Behavior*. Vol. 18, 667-683.
- Hutcheson, G. D., & Sofroniou, N. (1999). The Multivariate Social Scientist: Introductory Statistics Using Generalized Linear Models. *Sage*. 223-226.
- Igbaria, M., Iivari, J., & Maragahh, H. (1995). Why do individuals use computer technology? A Finnish case study. *Information & Management*. Vol. 29, 227-238.
- Igbaria, M., Parasuraman, S., & Baroudi, J. (1996). A motivational model of micro-computer usage. *Journal of Management Information Systems*. Vol. 13, No. 1, 127-143.
- James, N. W., Ingram, C., Källstrand, C., & Teigland, R. (2015) Stockholm FinTech: An overview of the FinTech sector in the greater Stockholm Region. *Stockholm Business Region*. 7-8.
- Jay, F. (2010). *The Joy of Less: A Minimalist Living Guide: how to Declutter, Organize, and Simplify Your Life*. Anja Press.
- Jgaskin. (2016). Confirmatory Factor Analysis, StatWiki. Available at: http://statwiki.kolobkreations.com/index.php?title=Confirmatory_Factor_Analysis, [15.05.2016]
- Joreskog, K. (1993). Testing structural equation models. In K. A. Bollen & J. S. Logn (Eds.), *Testing structural equation models*. Newbury Park, CA: Sage. 294-316.
- Kaiser, H.F. (1974). An index of factorial simplicity. *Psychometrika*, Vol.39, 31-36.

- Kantox (2016). Definition of FinTech. Available at: http://kantox.com/en/glossary/fintech_9, [15.05.2016]
- Kegerreis, R. J., Engel, J. F, & Blackwell, R. D. (1970). Innovativeness and Diffusiveness: A Marketing View of the Characteristics of Early Adopters in Research in Consumer Behavior, in D. Kollat, R. Biackwell and J, Engels (eds,). Holt, Rineholt, and Winston, New York. 671-689.
- Keira, M. D., & Payvision BV. (2015). The Mobile Payment Revolution, How to be ready for the tipping point. *Payvision. Global Card Process*.
- Kenny, D. A. (2015). Measuring Model Fit. Available at: <http://davidakenny.net/cm/fit.htm>, [15.05.2016]
- Kim C., Mirusmonov, M., & Lee, I. (2010). An empirical examination of factors influencing the intention to use mobile payment. *Computers in Human Behavior*. Vol. 26, 310-322.
- Kim Y., Park, Y. J., Choi, J., Yeon, J. Y. (2015). An Empirical Study on the Adoption of FinTech Service: Focused on Mobile Payment Services. *Advanced Science and Technology Letters*. Vol. 114, No.26, 136-140.
- Kim, D., & Benbasat, I. (2003). Trust-related arguments in internet stores: a framework for evaluation. *Journal of Electronic Commerce Research*, Vol. 4, No. 2, 49-63.
- Kim, H. W., Chan, H. C., & Gupta, S. (2007). Value-based Adoption of Mobile Internet: An Empirical Investigation. *Decision Support Systems*. Vol. 43, No. 1, 111-126.
- Kim, Y., Choi, J., Park, Y. J., Yeon, J. Y. (2016). The Adoption of Mobile Payment Services for FinTech. *International Journal of Applied Engineering Research*. Vol.11, No. 2, 1058-1061.
- Kinsman, B. (2015). Minimalism and the Finnish character. Available at: <http://berinkinsman.com/2015/09/18/minimalism-and-the-finnish-character/>, [15.05.2016]
- Kline, R. B. (2010). Principles and practice of structural equation modeling (3rd edition). *New York: Guilford*. 70-110.
- Kossmann, S. (2016). 8 FAQs about EMV credit cards. Chip? PIN? Signature? Will old cards work? Answers to frequently asked questions. Available at: <http://www.creditcards.com/credit-card-news/emv-faq-chip-cards-answers-1264.php>, [15.05.2016]
- Laukkanen, T., & Pasanen M. (2008). Mobile banking innovators and early adopters: How they differ from other online users? *Journal of Financial Services Marketing*. Vol. 13, No. 2, 86-94.

- Legris, P., Ingham, J., & Colletette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model, *Information & Management*. Vol. 40, No. 3. 191-204.
- Limayem, M., Khalifa, M., & Frini, A. (2000). What makes consumers buy from Internet? A longitudinal study of online shopping. *IEEE Trans. Systems, Man, and Cybernetics, Part A*. Vol.30, 421-432.
- Lucas, H. C., & Spitler, V. K. (2000). Implementation in a world of workstations and networks, *Information & Management*. Vol. 38, No. 2, 119-128.
- MacCallum, R. C., Widaman, K. F., Preacher, K. J., & Hong, S. (2001). Sample Size in Factor Analysis: The Role of Model Error. Lawrence Erlbaum Associates, Inc. *Multivariate Behavioral Research* Vol. 36, No. 4, 611-637.
- Mallat, N. (2007). Exploring consumer adoption of mobile payments - A qualitative study. *J. Strategic Inf. Sys.* Vol.16, 413-432.
- Mallat, N., Rossi, M., Tuunainen, V.K., & Öörni, A. (2008). An empirical investigation of mobile ticketing service adoption in public transportation. *Personal and Ubiquitous Computing*. Vol.12, 57-65.
- Mari, S. (2003). Adoption of mobile banking in Finland. *Jyväskylän yliopisto*.
- Matsunaga, M. (2010). How to factor-analyze your data right: do's, don'ts, and how-to's. *Int J Psych Res.* Vol, 3, 97-110.
- McAuley, D. (2015). What is FinTech? Available at: <https://medium.com/wharton-fintech/what-is-fintech-77d3d5a3e677#.h18rlmv2s>, [15.05.2016]
- Mikael, C., & Frank, T. (2011). Lazy User Model: Solution Selection and Discussion about Switching Costs. *SCIS*. Vol, 86, 56-68.
- Mnmlist: minimalist FAQs. Available at: <http://mnmlist.com/minimalist-faqs/>, [15.05.2016]
- Moenninghoff, S., & Wieandt, A. (2012). The Future of Peer-to-Peer Finance. *Zeitschrift für Betriebswirtschaftliche Forschung*, 466-487.
- Moon, J. W., & Kim, Y. G. (2001). Extending the TAM for the World-Wide-Web context. *Information and Management*. Vol. 38, 217-230.
- Moon, M. (2004). Plastic wants to be the only credit card you'll ever need. *Engadget*. Available at: <http://www.engadget.com/2014/10/08/plastic-card-preorder/>, [15.05.2016]
- Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*. Vol. 2, No. 3, 192-222.

- Muala, A. (2011). Determinant factors of tourists' satisfaction in Muslim's Countries: A Structural equation model (SEM). *American Academic & Scholarly Research Journal*. Vol. 1, No. 1, 21-26.
- Mukherjee, & Nath, P. (2003) A model of trust in online relationship banking. *International Journal of Bank Marketing*. Vol. 21, No. 1, 5-15.
- Mukherjee, A. & Nath, P. (2003). A model of trust in online relationship banking. *International Journal of Bank Marketing*. Vol.21, No.1, 5-15.
- Munch, J. (2015). What is FinTech and why does it matter to all entrepreneurs. Available at: <https://www.hottopics.ht/stories/finance/what-is-fintech-and-why-it-matters/Osratf>, [15.05.2016]
- Novak, J. (2010). Internal influence: Lifestyle and Attitude. Available at: <http://www.marketingteacher.com/internal-influences-lifestyle-and-attitude/>, [15.05.2016]
- Osborne, J. (2008). Best practices in quantitative methods: 3 Best Practices in Interrater Reliability Three Common Approaches. *Thousand Oaks. SAGE Publications, Inc.*
- Osborne, J. W., & Banjanovic, E. S. (2016). Exploratory Factor Analysis with SAS. (1 edition). *SAS Institute*. 159-169.
- Osratf, A. (2014). *The Goal of Society: A Necessary Knowledge*.
- Parveen, F., & Sulaiman, A. (2008). Technology Complexity, Personal Innovativeness, and Intention to Use Wireless Internet Using Mobile Devices in Malaysia. *International Review of Business Research Papers*. Vol. 4, No.5, 1-10.
- Pavlou, P.A., Liang, H., & Xue, Y. (2007). Understanding and Mitigating Uncertainty in Online Exchange Relationships: A Principal-Agent Perspective. *MIS Quarterly*. Vol. 31, 105-136.
- Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnla, S. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. *Internet Research*. Vol. 14, No. 3, 224-235.
- Plastc. Available at: <https://plastc.com/>, [22.04.2016]
- Promptanapakdee, S. (2009). The Adoption and Use of Personal Internet Banking Services in Thailand, *The Electronic Journal on Information Systems in Developing Countries*, Vol. 37, No. 6, 1-31.
- Pura, M. (2005). Linking perceived value and loyalty in location -based mobile services. *Managing Service Quality: An International Journal*. Vol. 15, No. 6, 509-538.

- Qeisi, K. A., & Abdallah, G., A. (2013). Internet Banking Adoption in Jordan: A Behavioral Approach. *International Journal of Marketing Studies*. Vol. 5, No. 6, 84-104.
- Research and Markets. (2016). the Cards and Payments Industry in Finland: Emerging Trends and Opportunities to 2019. Available at: http://www.researchandmarkets.com/research/gwd3zh/the_cards_and, [15.05.2016]
- Rigopoulos, G & Askounis, D. (2007). A TAM Framework to Evaluate Users' Perception towards Online Electronic Payments, *Journal of Internet Banking and Commerce*, Vol. 12, No. 3, 2-6.
- Roboff, G. & Charles, C. (1998). Privacy of financial information in cyberspace: banks addressing what consumers want. *Journal of Retail Banking Services*. Vol. 20, No. 4, 51-6.
- Rogers, E. (1995). Diffusion of Innovations. *Free Press, New York*.
- Rosnow, R. L., & Rosenthal, R. (1999). Beginning behavioral research: a conceptual primer (3rd edition). *Upper Saddle River, NJ: Prentice Hall*
- Rouibah, K., & Abbas, H. (2010). Effect of Personal Innovativeness, Attachment Motivation and Social Norms on the Acceptance of Camera Mobile Phones: An Empirical Study in an Arab Country. *International Journal of Handheld Computing Research*. Vol. 1, No. 4, 41-62.
- Ryan, R. M. & Deci, E. L. (2000). Intrinsic and extrinsic motivations: classic definitions and new directions, *Contemporary Educational Psychology*. Vol. 25, 54-67.
- Ryan, R. M. (1982) Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personal Social Psychology*. Vol. 43, 450-461.
- Safeena, R., Date, H., & Kammani, A. (2011). Internet Banking Adoption in an Emerging Economy: Indian Consumer's Perspective. *National Institute of Industrial Engineering, Mumbai, International Arab Journal of e-Technology*, Vol. 2, No. 1, 56-61.
- Salisbury, W., Pearson, R., Pearson, A., Miller, D. (2001). Identifying Barriers That Keep Shoppers off the World Wide Web: Developing a Scale of Perceived Web Security. *Industry Management and Data Systems*. Vol. 101, No. 4, 168-176.
- Sathye M. (1999). Adoption of Internet banking by Australian consumers: an empirical investigation. *International Journal of Bank Marketing*. Vol. 17 No. 7, 324-334.
- Schumacker, R. Lomax, R. (2004). A Beginner's Guide to Structural Equation Modeling (2nd edition). *Mahwah, NJ: Lawrence Erlbaum*.

- Sharma, S., Mukherjee, S., Kumar, A., & Dillon, W.R. (2005). A simulation study to investigate the use of cutoff values for assessing model fit in covariance structure models. *Journal of Business Research*. Vol. 58, No.1, 935-43.
- Shieber, J. (2014). Plastic Launches a Coin Competitor As the Smart Card Market Heats Up. TC. Available at: <http://techcrunch.com/2014/10/07/plastic-launches-a-coin-competitor-as-the-smart-card-market-heats-up/>, [15.05.2016]
- Shieber, J. (2014). Plastic Launches a Coin Competitor As the Smart Card Market Heats Up. *TechCrunch*. Available at: <http://techcrunch.com/2014/10/07/plastic-launches-a-coin-competitor-as-the-smart-card-market-heats-up/>, [15.05.2016]
- Sjöroos, M. (2016). Finnish fashion embodies playful minimalism. Available at: <http://www.helsinkidesignweek.com/weekly/finnish-fashion-embodies-playful-minimalism/?lang=en>, [15.05.2016]
- Smith, A. A., Synowka, D. P., & Smith, A. D. (2014). E-commerce quality and adoptive elements of e-ticketing for entertainment and sporting events. *IJBIS*. Vol.15. 450-487.
- Sushila, M. (2016). Securing Transactions and Payment Systems for M-Commerce. *Advances in E-Business Research. IGI Global*, 25-41.
- Szajna, B. (1996). Empirical evaluation of the revised technology acceptance model. *Management Science*. Vol. 42, No. 1, 85-92.
- Taylor, S. & Todd, P. (1995). Assessing IT usage: The role of prior experience. *MIS Quarterly*. Vol. 19, No. 4, 561-570.
- Technovelgy.com. what is RFID. Available at: <http://www.technovelgy.com/ct/technology-article.asp>, [15.05.2016]
- Teo, T. S. H., Lim, V. K. G., & Lai, R. Y. C. (1999). Intrinsic and extrinsic motivation in Internet usage. *Omega*. Vol. 27, No. 1, 25-37.
- Thatcher, J. B., & Perrewe, P. L. (2002). An empirical examination of individual traits as antecedents to computer anxiety and computer self-efficacy. *MIS Quarterly*. Vol. 26, No. 4. 381-396.
- Thompson, B. (2004). Exploratory and confirmatory factor analysis: Understanding concepts and applications. *Washington, DC, US: American Psychological Association*.
- Thompson, R., L, Higgins, C. A., & Howell, J. M. (1991). Personal Computing: Toward a Conceptual Model of Utilization. *MIS Quarterly*. Vol. 15, No. 1, 124-143.
- Tiko, I. (2015). Strategic Information Technology Governance and Organizational Politics in Modern Business. *Cape Peninsula University of Technology. South Africa. IGI Global*. 15-25.

- Vallerand, R.J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. Zanna (Ed.), *Advances in experimental social psychology*. New York: Academic Press. 271-360.
- Venkatesh, V., & Davis, F. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*. Vol. 46, No. 2, 186-204.
- Venkatesh, V., & Speier, C. (1999). Computer Technology Training in the Workplace: A longitudinal Investigation of the Effect of the Mood. *Organizational Behaviour and Human Decision Processes*. Vol. 79, No. 1, 1-28.
- Venkatesh, V., Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*. Vol. 27, No. 3. 425-478.
- Venkatesh, V., Thong, J.Y. L., & Xin, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, Vol. 36, No. 1, 157-178.
- Wei, T.T., Marthandan, G., Ching, A.Y.L, Oi, K.B., & Arumugam, S. (2009). What drives Malaysian m-commerce adoption? An empirical analysis. *Industry Management & Data Systems*. Vol. 109, No. 3, 370-388.
- Wiedmann, K. P., Hennigs, N., Varelmann, D., & Reeh, M. O. (2010). Determinants of Consumers' Perceived Trust in IT-Ecosystems. *Journal of Theoretical and Applied Electronic Commerce Research*. Vol. 5, No. 2, 137-154.
- Wolf, E.J., Harrington, K. M., Clark, S.L., & Miller, M.W. (2013). Sample size requirements for structural equation models an evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement*. Vol. 73, No. 6, 913-934.
- Wu, J. H., & Wang, S. C. (2005). What drives mobile commerce? An empirical evaluation of the revised technology acceptance model. *Information & Management*. Vol. 42, No.1, 719-729.
- Xu, X.Y. (2014). Understanding Users' Continued Use of Online Games: An Application of UTAUT2 in Social Network Games. *The Sixth International Conferences on Advances in Multimedia*. 58-65.
- Yi, M. Y., Jackson, J. D., Park, J. S., & Probst, J. C. (2006). Understanding information technology acceptance by individual professionals: Toward an integrative view. *Information & Management*. Vol. 43, 350-363.
- Yoo, S. J., Han, S. H., & Huang, W. (2012). The roles of intrinsic motivators and extrinsic motivators in promoting e-learning in the workplace: A case from South Korea. *Computers in Human Behavior*. Vol. 28, 942-950

Zarmpou, T., Saprikis, V., & Vlachopoulou, M. (2010). Investigating the Influential Factors towards Mobile Services Adoption in Greece. *Dynamic Publishers, Inc., USA Information Assurance and Security Letters*. Vol. 1, 72-79.

Zhong, J. Y., Dhir, A., Nieminen, M., Matti, H., & Laine, J. (2013). Exploring Consumer Adoption of Mobile Payments in China. *MINDTREK*.

Appendix A: Survey Scenario Cover Letter

The Source of the pictures & video attached: www.plastic.com

FinTech Acceptance Research

Plastic card is an all-in-one payment solution which allows you to store up to 20 smart cards into one sophisticated device.

1. **E-ink touchscreen** to unlock the device, to display the selected card's details, to swipe between different cards.



- | | |
|----------------------------------|---|
| 1. Chip and PIN | 5. Rechargeable Battery (30-day charge) |
| 2. E-ink Touchscreen | 6. Rewritable Magnetic Stripe |
| 3. Bluetooth | 7. Rewritable RFID/NFC |
| 4. Flash Memory (up to 20 cards) | 8. Wireless Charging |

2. The internal **battery can work for 30 days** – and you **recharge** it wirelessly, using some kind of induction charging plate.



3. Pre-order : **\$155** with two year warranty.

After pre-orders, retail for **\$180** including an **18 month subscription**, with ongoing service available for **\$50/year**.

4. **No visible personal information on the card.**



5. Data is synced with an app through your phone by Bluetooth. **If lost**, it will erase the personal data and automatically notify you.



Please go to <https://plastic.com/> for more information, or watch the short video (35 secs) below and answer the questions, millions of thanks!!!

