User acceptance of E-Payment Systems in the Context of Cultural Influence

A case study of PayEx in Linnaeus University

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Abstract

With the technological development of e-commerce and the increasing necessity to use online transactions, more and more online electronic payments systems have appeared to meet global demand. Furthermore, user acceptance of these kinds of systems is different for individuals in different cultures, and culture could be a factor that has great potential impact on predictions of user acceptance. The world has evolved to a degree where transactions occur between different cultural environments. This study aims to provide an understanding of how culture affects users’ intentions of electronic payment systems. Based on the purpose of this study, a questionnaire has been conducted in the interest of collecting data for statistical purposes. To make more sense about the results, a case study on PayEx (an electronic payment system) in Linnaeus University has been conducted through analysing twenty users’ interview records. Finally, this study expands on user acceptance research through looking at the role of culture and social influence. In practice, the results of this study give the thought for accurate forecasting of user acceptance towards electronic payment systems with considering cultural influence.

Keywords: Electronic payment systems, user acceptance, cultural influence
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List of Abbreviations
EPS: Electronic Payment System
SEM: Structural Equation Modelling
TAM: Technology Acceptance Model
UTAUT: Unified Theory of Acceptance and Use of Technology
1 Introduction

This chapter provides general information on this study. It emphasizes the purpose and outlines the research questions. It also mentions the practical significance of conducting this research.

1.1 Problem statement

As a critical component of doing business in today’s economy (Kousaridas, et al., 2008), the electronic payment system (EPS) has its advantages in providing convenience, anonymity, efficiency and various economic characteristics (Abrazhevich, 2004; Kousaridas, et al., 2008) through applying information technologies to provide online financial services (Kousaridas, et al., 2008). Being different to traditional payment approaches provided by officials in financial institutions, the electronic payment system has been deployed in several countries, based on the growth of the global online market, to conduct international transactions, removing the limitations of time and geography (Sumanjeet, 2009; Kim et al., 2010). Although EPS is a type of information system for financial exchange (Briggs and Brooks, 2011; Ifinedo, 2012), which transfers financial and transaction information between parties related to business (Sumanjeet, 2009), it puts greater demands on accuracy and security of online activities than other general Internet-based information systems (Kim, et al., 2010).

Globally, most online payment services are provided by banks, financial institutions and some Internet-based companies, such as Visa, MasterCard, and PayPal, one of the widely used micropayment solutions in operation (Lim, et al., 2007; Fung, et al., 2014). Kim, et al. (2010) have compiled five categories of electronic payment systems that are in use (Lawrence, et al., 2002; Abrazhevich, 2004; Guan and Hua, 2003; Dai and Grundy, 2007; Schneider 2007). These are electronic cash, pre-paid card, credit cards, debit cards, and electronic checks (Kim, et al., 2010, pp.85-87). Although there are numerous electronic payment systems in use, not all of them have been as successful as PayPal or are in common usage in the way credit cards are (Lee, and Kurnia, 2007). In fact, there have been some major failures, such as Beenz, CyberCashe, Cybercent, Digicash, and eCharge (Hurwicz, 2001; Kniberg, 2002; Lim, et al., 2007). The reasons for failure may vary (Lim, et al., 2007). But the adoption of online EPS may be one of the most critical reasons. In the research of Abrazhevich, et al. (2009), “low-level adoption” (Bank for International Settlements, 2000) and “slowing down” of online EPS adoption (ECB, 2003) are emphasised. To minimize the risk of users’ rejection of specific information technologies, to increase adoption of technologies as planned by users, to benefit the design process and implementation, researchers have explored factors through establishing and developing models on model user acceptance, which is actors’ willingness to apply the information technology to tasks (Dillon, 2001). Those factors that can affect usage and acceptance of technologies have been explored since Bailey and Pearson’s information system satisfaction factors list appeared (1983). Historically, the most widely used model is the original Technology Acceptance Model (TAM), as suggested by Davis (1985) that caught the attention of academics with its two major variables, perceived usefulness and perceived ease of use, and has proven successful in
predicting about 40% of a system’s use in the U.S.A. Recently, Venkatesh, et al.’s Unified Theory of Acceptance and Use of Technology (UTAUT) (2003) has proven to be more popular than TAM, with its more accurate predictions (Marchewka, et al., 2007). However, prior research on user acceptance has focused more on general information technologies and little work has been done on EPS. Therefore, this study explores factors impacting on user acceptance of electronic payment systems based on the extended user acceptance model.

Based on international e-commerce technologies and global market developing rapidly, EPS needs more attention as a special form of information system. The third-party e-payment system research conducted by Xie and Lin (2014) applied a user acceptance model to predict the adoption of EPS.

Interestingly, when Straub, Keil and Brenner (1997) applied TAM for testing user acceptance into the same instrument in different cultures, the results showed differences existed across these cultures. Similarly, Terzis, et al. (2013) found user behavioural intentions were different in Greece and Mexico. Furthermore, information systems should not only be an initial technology; they should integrate technology, management, organization and environmental and socio-economic factors (Elliot and Avison, 2005; Pick and Azari, 2008). Based on the above results, we can postulate that culture might have some impact on user acceptance.

In 2006, Srite and Karahana explored the relations between culture and acceptance by foreign students of personal computers across universities in the U.S.A. Their findings need to be examined “across a wider range of individuals in different environments and with different technologies” (Srite and Karahana, 2006). They also mentioned that interviews or other qualitative research could provide deeper meaning (Srite and Karahana, 2006). Although an increasing number of researchers probably sense the importance of culture when working on user acceptance, there is still a gap in understanding on how culture affects user acceptance of specific technology, especially EPS.

Looking at how culture affects user acceptance is valuable for improving user acceptance research. The results may contribute to better EPS adoption.

A case study has been conducted to provide more details on the topic. The case study is about users from different cultural backgrounds (Linnaeus University international students) using an electronic payment system (PayEx) for a task (paying the printing fee for using printing machines in Linnaeus University).

1.2 Purpose and research questions

The major purpose of this study is to contribute to the gap in understanding of the influence of culture on EPS user acceptance through determining the relations of the cultural influence variables in the research model and their effect on technology acceptance.

The research questions are listed as below.
RQ1: Does culture affect users’ behavioural intentions in the acceptance of an electronic payment system?

RQ2: How does culture affect users’ behavioural intentions in the acceptance of an electronic payment system?

1.3 Delimitations

This thesis focuses on the acceptance of electronic payment systems while considering their special characteristics, which refer to their attributes in financial transactions and the Internet. Furthermore, it emphasizes the role of culture in user acceptance research. All of the results achieved in this study are based on the case study involving PayEx in Linnaeus University.

Specially, this study discusses cultural influences at the individual level. Culture is an abstract concept formed through grouping most members’ attributions in a particular way, therefore culture cannot be used for representing each member’s attributions. User acceptance is related to individual choices. Culture at a national level or a group level cannot be applied to explaining the case. To understand how the culture affects the personal choice on using the EPS in practice, exploring cultural attributes of the person as the way of exploring culture influence at the individual level is required.

1.4 Contribution of this study

In theory, this study may contribute to studies on user acceptance by providing more cross-cultural linkages to real business (Legris, et al., 2003). This study can be seen as an expanding of Srite and Karahana’s study (2006) through the provision of a structure equation model for statistical analysis, adding qualitative research through interview and text analysis, and applying theories to electronic payment systems. The methodology applied in the research provides an example for further studies. The results achieved can support the prediction of how well electronic payment systems will be adopted.

1.5 Disposition

This report includes seven parts. At the outset, Chapter 1 indicates what the research topic is in general. The purpose and research questions are introduced as well. The benefits of this study are provided at the end of this section. Then, in Chapter 2, the paper provides a basic understanding of the literature background. With the help of this overview, the research model and hypotheses are established. After that, the main ideas of research design are shown in Chapter 3. These include research approaches, the research framework, data collection methods, analysing the methods and ethical considerations. The next chapter (Chapter 4) presents how the data and samples will be collected. In Chapter 5, statistics and text analysis are recorded in detail. A related discussion is presented in Chapter 6 to explain in more depth the results, limitations, contributions, further research and further reflections. The last chapter (Chapter 7) summarizes the remainder of the research, emphasizing its implications. Related literature is listed in the Reference section. The original questionnaire and interview guidelines can be found in the appendices.
2 Literature Review

This chapter presents the research background, including a literature review on electronic payment systems, technology acceptance, technology acceptance in cultural contexts and cultural influence. It also introduces the research model and the hypotheses.

2.1 Electronic payment systems

The electronic payment system as a financial information exchanging system (Ifinedo, 2012) is a type of payment system used to support further development in e-commerce and e-business (Kalakota and Whinston, 1997; Kousaridas, et al., 2008). Pre-paid cards, e-money products and other financial products are not based on traditional payment approaches, but are “innovative payment products”, according to a survey by the World Bank (2011, p.44).

In that report, the World Bank (2011, p.40) published findings of a survey on global payment systems, and provided some guidelines for making retail payments. Ease of access to payment systems and services, and availability of infrastructure for electronic payment instruments, are the two key advantages of electronic payment systems (The World Bank, 2011, p.42). In contrast to the use of cash or paper-based payments, countries that successfully adopt electronic payment systems can increase efficiency and save both on processing time and costs (The World Bank, 2011, p.69). Electronic payment systems have the advantage of convenience, anonymity and not being restricted by geography (Abrazhevich, 2004; Kousaridas, et al., 2008).

Based on the different characteristics of electronic payment systems, Kim, et al. (2010, pp.85-87) sorted electronic payment systems into five categories. Pre-paid cards, credit cards and debit cards support both online and offline services, but electronic cash and electronic checks only provide online services. Electronic cash can be viewed as a mechanism for purchasing electronic digital money from an issued group (Abrazhevich, 2004). For example, it might cost $1 to purchase 4 units of digital money for buying online goods on a specific website. Pre-paid cards are mostly used in store transactions, whereby money is stored on cards issued by the store, which can be given to others as a gift, providing convenience and ease of use (Kniberg, 2002; Kim, et al., 2010, p.86). Credit cards are the most frequently used electronic payment system (Chou, et al., 2004), providing the highest degree of privacy and security (Stroborn, et al., 2004), similar to offline credit cards services (Lawrence, et al., 2002). In contrast to credit cards, debit cards are for debit transaction, which means the money for the transaction comes from cards holders’ accounts (Abrazhevich, 2004). Electronic check is mostly used in B2B marketing, which referring to the electronically check transactions between buyers’ and seller’s banks (Kim, et al., 2010), through authentication, cryptography, digital signatures and encryption steps.

Historically, with the growth of the international online market and developing of information technologies, the adoption of EPS is extended over the world rapidly (Sumanjeet, 2009; Kim, et al., 2010). In Abrazhevich (2004)’s paper, it quotes the Bank
for International Settlement’s (BIS) survey in 2000, which indicates a low level usage of electronic payment system in global, and European Central Bank’s (ECB) result in 2001, EPS is still not adopted widely (Abrazhevich 2004). But in 2011, the World Bank found there was widespread adoption of electronic payments approaches for transactions, especially for retail payments (p.44). In total, 91 countries had Internet banking services (The World Bank, 2011, p.44). Electronic credit transfer was the most popular EPS system in European Union countries (The World Bank, 2011, p.53).

Based on the above indications, electronic payment systems are developing rapidly, with credit cards being the most successful service adopted (Lee, and Kurnia, 2007) and most frequently used (Chou, et al., 2004). What about the others? Obviously, not all of them, such as CyberCashe, Digicash, eCharge, can be as successful as credit cards (Hurwicz, 2001; Kniberg, 2002; Lim, et al., 2007). Widespread adoption is the most critical issue for an EPS to be successful (Abrazhevich, et al., 2009).

2.2 Technology acceptance

Since the term user acceptance was coined, it has become one of the most important issues for technology adoption, especially in information systems. Dillon and Morris (1996) have defined user acceptance as “the demonstrable willingness within a user group to employ information technology for the tasks it is designed to support”. As a pivotal factor determining the success or failure of any information system project (Davis, 1993), it has formed the basis of many studies on information technology that report that user attitudes and human factors are important aspects affecting the success of an information system (Davis, 1989, Burkhardt, 1994, Rice and Adyn, 1991). A well-known approach to explaining and modelling user acceptance is the original Technology Acceptance Model (TAM) (Davis, 1989).

In the meta-analysis conducted by Lee, et al. (2003), the history of TAM’s study is divided into three sections, namely the model introduction period, the model validation period and the model extension period. There are more than one hundred papers that focus on the exploration of user acceptance (Lee, et al., 2003; Schepers and Wetzels, 2007). They cover several different types of technologies and samples, measured relations and external variables (Lee, et al., 2003). Lee, et al. has summarized these according to their authors, subjects, methodologies and places of publication (2003). Similar to Lee, et al., Legris, et al. (2003) conducted a meta-analysis of 22 articles. Moreover, King and He (2006) applied a meta-analysis that followed 88 TAM empirical studies. In these three meta-analysis studies, it is clear that almost all of the prior research used students as surrogates for professionals, and used self-reporting in a real environment.

However, TAM does not take into account other factors that may be critical to user acceptance or rejection of such specific technology, such as age, gender, experience and whether participation was voluntary (Venkatesh, et al., 2003). In 2003, Venkatesh, et al. reviewed prior TAM research and other acceptance models, and proposed the “authoritative mode” model, the Unified Theory of Acceptance and Use of Technology (UTAUT). In contrast to TAM, UTAUT is a model for researching technology acceptance. It is based on eight different models, comprising task-technology fit,
Innovation Diffusion Theory, the Theory of Reasoned Action, the theory of Planned Behaviour, the Motivational Model, combined TAM and TPB, the Model of PC utilization and Social Cognitive Theory (Venkatesh, et al., 2003). The primary aim of conducting UTAUT is to give a general solution for choosing a model in further research. Four core dimensions are presented: performance expectancy, effort expectancy, social influence (including subjective norms, social factors and image) and facilitating conditions (Venkatesh, et al., 2003). In 2012, Venkatesh, et al. published the newest version of UTAUT, which provides the customer-use context with three additional constructs: hedonic motivation, price value and habit. Theories of user acceptance have been developing continuously. Although TAM is more suitable for information systems contexts than the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) and the Theory of Planned Behaviour (TPB) (Ajzen, 1991; Venkatesh, et al., 2003), the UTAUT model is better than TAM (Marchewka, et al., 2007).

2.3 Technology acceptance in cultural contexts

Historically, technology acceptance theories were applied in different environments with different technologies for fulfilling the requirements of industries in understanding users’ perspectives (Venkatesh, et al., 2003). However, the same Technology Acceptance Model may achieve different results in different cultures (Straub, Keil and Brenner, 1997). For example, Mejias, et al. (1997) found, in comparing culture in the United States and Mexico, that cultural dimensions affect the use of group support systems (GSS). Similarly, in Terzis, et al.’s research (2013), user behavioural intentions were different in Greece and Mexico.

Recently, more scholars have felt the importance of cultures, and some cultural theories have been applied in user acceptance research. In 2006, Srite and Karahana examined the relations between culture and user acceptance with foreign students’ acceptance of personal computers across different U.S. universities. Through providing a statistics analysis of correlations, they found that espoused cultural values may affect users’ acceptance (Srite and Karahana, 2006). Hofstede (1980)’s cultural value theory is one of fundamental theories in this research (Srite and Karahana, 2006). They mention that conducting qualitative research may bring more value to further research as well (Srite and Karahana, 2006).

2.4 Cultural influences

To explore the cultural influences on user acceptance of technology, an understanding of culture and related theories are required. Straub, et al. (2002, p.14) thought the reason for the difficulty in conducting cross-cultural research could be that IS researchers classify individuals as members of their national culture. Straub, et al. (2002, pp.14-18) summarized definitions of culture according to three categories: definitions based on shared value, definitions based on problem solving and general all-encompassing definitions, emphasizing Hofstede’s national-culture value (1980) in the first group’s definitions that are based on shared value. In Hofstede’s definition, culture is a collection of minds to distinguish “the members of one human group from another’s” (Hofstede, 1980, p.260), which is the one discussed in most fields (Straub, et al. 2002).
When Hofstede (1980) was in IBM, based on an understanding of culture, he found that the difference in employees’ value views were very big within IBM groups over the world. In 1968 and 1972, he made two cross-cultural studies of IBM employees, surveying 116,000 employees. With such a large amount of data, Hofstede tried to find interpret the cultural differences in behaviour. In his view, four dimensions of national culture can be used for distinguishing people, namely individualism/collectivism, power distance, uncertainty avoidance, and masculinity/femininity (Hofstede, 1980). Long-term/short-term orientation was added in 1988 (Hofstede and Bond, 1988).

McCoy, et al. (2005) conducted research (McCoy, 2002) by collecting data within the U.S.A. and abroad. But the results are different from Hofstede’ work (1980), especially in regard to the issue of uncertainty avoidance (McCoy, et al., 2005). The most important reason could be that the cultures of research countries have changed since Hofstede collected data in 1980 (McCoy, et al., 2005). The world changing rapidly and cultures do not stay in the past (McCoy, et al., 2005, p.214). Thus, they have suggested conducting research at the individual level (McCoy, et al., 2005).

But in Hofstede’s words, his original culture dimensions should be used only at the national level (1980) and cannot be applied to testing individual-level problems (Hofstede and Peterson, 2000). There are some misused situations in relation to Hofstede culture dimensions in prior studies (Bond, 2002). Taking a similar point of view, Kitayama (2002) has mentioned the problem of conducting a cultural system analysis to explore individual behaviour (Oyserman, et al., 2002). To avoid an ecological fallacy (Robinson, 1950), different levels of national culture and end-use behaviour are applied, one is at the macro level and the other, at the individual level (Strite and Karahanna, 2006). Hofstede’s national-culture dimensions cannot be used to explain individual-level behaviour.

Culture may influence individuals’ attitudes on business ethics and business practices (Swaidan, et al., 2009). According to the assumptions of Social Identity Theory (SIT), a “plurality of culture and sub-culture, such as ethnic, national, organizational” can impact on individuals (Straub, et al., 2002, p.13). Culture must be measured at the individual level (Straub, et al., 2002, p.19). Based on the original cultural dimensions devised by Hofstede (1980), Dorfman and Howell (1988) introduced an individual-level culture dimension items for culture measurement, which included five items, namely individualist/collectivist, uncertainty avoidance, masculinity/femininity, power distance, and paternalism (Dorfman and Howell, 1988; Clugston, et al., 2000; McCoy, et al., 2005). Espoused National Cultural Values (Strite and Karahana, 2006) is aimed at individual-level culture measurement, and can be used in technology acceptance research. However, there is still much work to be done in relation to culture measurement and linking IS research at the individual level (McCoy, et al., 2005).

2.5 Research model

Before introducing the research model, it is important to understand some important definitions. In this study, variables refer to the attributes or characteristics of electronic payment system users (Creswell, 2014, p.52) that may be related to culture or technology acceptance. Triandis (2004) concluded that culture can be viewed as a system with some
variables. To understand relations between the variables of cultural dimensions and user acceptance situation, the research model shown in Figure 1 (p.8) includes two components. One includes cultural variables as independent variables in the research model, which is based on Dorfman and Howell’s culture items (1988) and Srite and Karahanna’s espoused national cultural values (2006). The long-term/short-term orientation, which is based on Hofstede and Bond’s (1988) work, is considered as one variable of the cultural components. According to the definition of independent variables, they will probably influence the outcomes (Creswell, 2014, p.52). These four independent variables are individualism/collectivism, masculinity/femininity, uncertainty avoidance, and long-term/short-term orientation.

The other component is related to technology acceptance, which is the extension version of the Davis’s TAM (1989) with two more variables, social influence and facility conditions from UTAUT (Venkatesh, et al., 2003). In the technology acceptance component, there are four intervening variables and a dependent variable. Usefulness, ease of use, social influence and facility conditions are intervening variables, which may be affected by the independent variables, and behavioural intention are the dependent variables (Creswell, 2014, p.52).

Therefore, this research model is made up of nine variables. Because of prior studies has proved the relations between these intervening variables and behavioural intention, which can be found on page 5. All of usefulness, ease of use, social influence and facility conditions are proved with positive affect on user acceptance. To understand how the cultural influence affect users’ behaviour intention, the key point is to understand how these independent variables works on these intervening variables.

Figure 1. Research model.
Below are the definitions of these variables. At the beginning, it is important to emphasize the difference between cultural influence and social influence. In this study, the cultural influence refers to some abstract personal attributions affected by their nations, their class-consciousness and their social milieus. By contrast, the social influence mentioned in the research model is the influence of others’ opinions to accept the specific technology, the PayEx in the case.

Individualism and collectivism refer to the extend individuals prefer to be members of groups than being by themselves (Hofstede, 1980; Dorfman and Howell, 1988). People who score highly for individualistic traits are more self-oriented and believe in their decisions. In contrast, group interests are preferred over individuals’ interests for people who have low scores for individualism (high scores for collectivism) (McCoy, et al., 2005).

Masculinity/femininity is not related to gender, but to how people value material things or relationships with others (Dorfman and Howell, 1988). People with high scores of masculinity are focused on what they achieve. But people with low scores of masculinity (high scores of femininity) pay more attention to the experience of working with others (Dorfman and Howell, 1988).

Uncertainty avoidance presents the extent of people’s feelings towards threats, which they attempt to avoid or reject (Dorfman and Howell, 1988). People scoring high on uncertainty avoidance will do anything to reduce uncertainty (Dorfman and Howell, 1988).

Power distance refers to the extent person accept their superiors’ tasks because of the position (Dorfman and Howell, 1988). People scoring high on power distance follow their superiors asking few questions (McCoy, et al., 2005).

Hofstede and Bond studied long-term/short-term orientation through cooperating with Chinese researchers (1988). People with long-term orientation have “a longer time horizon in their decisions” (McCoy, et al., 2005).

Although power distance is one of Hofstede’s national cultural dimensions (Hofstede, 1980) and a key point in both Dorfman and Howell’s work (1988) and Strite and Karahana’s paper (2006), a group will also include individualism/collectivism (Oyserman, et al., 2002). As reviewed by Oyserman, et al. in 2002, individualism/collectivism overlaps with power distance. Moreover, this study focuses on how cultural variables affect intervening variables. Among intervening variables, social influence may include the impact from superiors, according to its definition. Keeping the above considerations mind, power distance is not valuable to this research.

Furthermore, the original TAM includes three variables, usefulness, ease of use and behavioural intention. According to a study conducted by Oh et al. in 2006, “the concept of mutuality of stakeholder benefits has been used to explain the adoption of EPS”. Social influence should be discussed within the topic. The UTAUT model mentioned by Venkatesh, et al. (2003) introduces the theoretical background of social influence and facility conditions. In considering the above, social influence and facility conditions are two additional intervening variables to be added to the research model.
Perceived usefulness reflects people’s feelings of whether a specific system is useful for improving work performance (Davis, 1989). Based on the understanding of TAM and prior research, the person always chooses to use specific technology or system considering if it will bring benefits to the improvement of performance (Venkatesh, et al., 2003).

Perceived ease of use can be replaced by the effort expectancy of UTAUT, and has a direct effect on behaviour intention and perceived usefulness (Venkatesh, et al., 2003), which is the extent of users’ beliefs that specific technology can be used easily (Davis, 1989).

Social influence illustrates the influence of others’ opinions in making decisions about using a specific technology (Venkatesh, et al., 2003).

Facility condition represents the extent of users’ feeling that external factors will support the use of a specific technology (Venkatesh, et al., 2003).

Behavioural intention refers to the predictability degree by which people would like to use technologies for specific tasks (Davis, 1989). In this study, behavioural intention is set to be the same with the final result. Everybody chooses to use payment systems. Because this study focuses more on the cultural influences of user acceptance, it will explore whether individuals choose to use this technology or not, what cultural influences are present and how the process impacts on the making of decision.

2.6 Research hypotheses

Based on the research model, this part introduces hypotheses of the relations between these variables.

To make more sense of the relations between culture and user acceptance of electronic payment systems, a critical concept is applied to the forming of hypotheses. That is “trust”.

The significance of trust as a critical issue for electronic payment systems is mentioned in several prior studies. Users’ attitudes towards electronic payment systems can impact the adoption of technology (Kim, et al., 2010). Kousaridas, et al. (2008) noted that trust could bring higher gains in adoption, and distrust could result in losses. Kim, et al. (2010) believe trust can increase the possibility of individuals’ use of electronic payment systems, and they supported their hypotheses with an obvious piece of evidence: users’ perceived trust had a substantial influence on electronic payment system adoption. Thus, there was a positive relation between trust and user acceptance.

Furthermore, culture can impact on individuals’ attitudes strongly (Swaidan, et al., 2009). According to Swaidan, et al. (2009), culture can affect personal beliefs and values, and these are two factors affecting individuals in making personal choices based on trust or distrust (Kim, et al., 2010). Based on trusting relations, electronic payment systems acceptance and culture, and the research mentioned in the literature review, this study proposes that cultural factors can impact on electronic payment systems’ acceptance.
2.6.1 Individualism/Collectivism

According to Triandis, et al. (1988) and Earley (1994), individuals care less about in-group places than collectivists. Individuals may pay more attention to freedom, personal time and the challenges of looking after themselves (Al-Qeisi, 2009). In linking individualism/collectivism to social influence, Triandis (1989) discussed how people individually focus on the private self and, collectively, individuals tend more to collectivise the self. Within the private self, individuals’ self-definitions are more based on their own internal attitudes, with less social influence being apparent (Srite and Karahanna, 2006).

H1: A positive relationship between collectivism and the acceptance of electronic payment systems; and a negative relationship between individualism and acceptance of electronic payment systems.

H1a: A positive relationship between collectivism and perceived usefulness; a negative relationship between individualism and perceived usefulness.

H1b: A positive relationship between collectivism and perceived ease of use; a negative relationship between individualism and perceived ease of use.

H1c: A positive relationship between collectivism and social influence; a negative relationship between individualism and social influence.

H1d: A positive relationship between collectivism and facility conditions; a negative relationship between individualism and facility conditions.

2.6.2 Masculinity/Femininity

With the help of Bem’s Sex Role Inventory (BSRI, 1974), different attributes of masculinity, femininity and neutrality are presented. Venkatesh, et al., (2004) defined the role of gender as a psychological construct in the effect of individual reactions to new technology. Generally, masculinity tends to be competitive, assertive and tough (Al-Qeisi, 2009). Meanwhile, femininity focuses on relationships and living environment (Al-Qeisi, 2009). According to Venkatesh and Morris in 2000, males tend more to use new technology than females, because masculinity is more focused on task completion. In the espoused national cultural values model created by Srite and Karahanna (2006), masculinity/femininity has a significant influence on user intention.

Therefore, the hypotheses are as follows:

H2: A positive relationship between masculinity and acceptance of an electronic payment system; a negative relationship between femininity and acceptance of electronic payment systems.

H2a: A positive relationship between masculinity and perceived usefulness; a negative relationship between femininity and perceived usefulness.

H2b: A positive relationship between masculinity and perceived ease of use; a negative relationship between femininity and perceived ease of use.
H2c: A positive relationship between masculinity and social influence; a negative relationship between femininity and social influence.

H2d: A positive relationship between masculinity and facility conditions; a negative relationship between femininity and facility conditions.

2.6.3 Uncertainty Avoidance

In Straub, et al.’s paper (1997), uncertainly avoidance impacting individual decision-making is discussed from both the perspective of Information Richness Theory and social presence. An individual chooses the medium according to the one that will most reduce uncertainty. To reduce uncertainty, individuals with a high degree of uncertainty avoidance tend to follow normal regulations or standards of processing for adjusting the system as appropriate (Evaristo and Karahanna, 1998) with the influence of near peers and friends, or even supervisors (social influence) (Srite and Karahanna, 2006). On the other hand, people with a lower degree of uncertainty avoidance are more willing to be curious (Dwyer, et al., 2005; Erumban and Jong, 2006).

Thus, the hypotheses can be reformulated as:

H3: There is a negative relationship between uncertainty avoidance and acceptance of an electronic payment system.

H3a: There is a negative relationship between uncertainty avoidance and perceived usefulness.

H3b: There is a negative relationship between uncertainty avoidance and perceived ease of use.

H3c: There is a positive relationship between uncertainty avoidance and social influence.

H3d: There is a positive relationship between uncertainty avoidance and facility conditions.

2.6.4 Long-term/short-term Orientation

Long-term individuals are more cautious to change and innovation (Dwyer, et al., 2005), and they spend more time adopting new things (Yalcinkaya, 2008).

Based on above, this study suggests:

H4: A positive relationship between long-term orientation and acceptance of an electronic payment system. A negative relationship between short-term orientation and acceptance of an electronic payment system.

H4a: A positive relationship between long-term orientation and perceived usefulness. A negative relationship between short-term orientation and perceived usefulness.

H4b: A positive relationship between long-term orientation and perceived ease of use. A negative relationship between short-term orientation and perceived ease of use.

H4d: A positive relationship from long-term orientation to facility conditions. A negative relationship between short-term orientation and facility conditions.

2.6.5 Usefulness

According to several empirical studies, perceived usefulness will impact on behavioural intention directly (Davis, 1989; Szajna, 1996; Venkatesh and Davis, 2000). Lee, et al. (2007) emphasized a positive role for perceived usefulness in affecting user acceptance. Taking a similar point of view, Abushanab and Pearson (2007) have suggested that higher performance leads to greater intentions of using Internet banking.

Based on above, this research suggests:

H5: There is a positive relationship between perceived usefulness and acceptance of an electronic payment system.

2.6.6 Ease of use

According to the definition introduced in the section on model presentation, it can be argued that if individuals think learning and using electronic payment systems are easy, they will be more willing to learn or use it. Furthermore, perceived ease of use has a positive effect on behaviour intention in empirical studies (Szajna, 1996). Recently, Xie and Lin (2014), in their research on third-party online payment adoption, examined the greater effect ease of use had on higher using intention.

Therefore, the hypotheses can be formulated as follows:

H6: There is a positive relationship between perceived ease of use and acceptance of an electronic payment system.

H6a: There is a positive relationship between perceived ease of use and perceived usefulness.

2.6.7 Social influence

Venkatesh, et al. emphasized the influence of perceptions of technology, whether with regard to internalization or identification, and how they may achieve better voluntary acceptance of technology (Venkatesh, et al., 2003). Although people retain their special attitudes to others’ opinions, they do not live alone (Swaidan, et al., 2009). Others may affect their beliefs, value views and decisions (Swaidan, et al., 2009).

Thus, the study postulates that:

H7: There is a positive relationship between social influence and acceptance of an electronic payment system.

2.6.8 Facility conditions

The results of World Wide Web adoption performed by Cheung, et al. (2000) present evidence of a strong influence from facility conditions on users’ behaviour. Specifically, that facility conditions can impact using intentions was shown in the case of an online payment gateway in Indonesia (Widjaja and Tedjawidjaja, 2012).

Thus, this study assumes:
H8: A positive relationship between facility conditions and acceptance of an electronic payment system.

H8a: A positive relationship between facility conditions and perceived ease of use.

### 2.6.9 Summary of research hypotheses

Table 1 summarizes the hypotheses put forward in this research.

<table>
<thead>
<tr>
<th>Intervening variables (Cultural influence)</th>
<th>Intervening variables (technology acceptance)</th>
<th>Dependent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent variables</strong></td>
<td><strong>Usefulness</strong></td>
<td><strong>Ease of use</strong></td>
</tr>
<tr>
<td>Individualism/collectivism</td>
<td>H1a</td>
<td>H1b</td>
</tr>
<tr>
<td>Masculinity/femininity</td>
<td>H2a</td>
<td>H2b</td>
</tr>
<tr>
<td>Uncertainty avoidance</td>
<td>H3a</td>
<td>H3b</td>
</tr>
<tr>
<td>Long-term/short-term orientation</td>
<td>H4a</td>
<td>H4b</td>
</tr>
<tr>
<td><strong>Dependent variable</strong></td>
<td><strong>Social influence</strong></td>
<td><strong>Facility conditions</strong></td>
</tr>
<tr>
<td><strong>Usefulness</strong></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Ease of use</strong></td>
<td>H6a</td>
<td>-</td>
</tr>
<tr>
<td><strong>Social influence</strong></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Facility conditions</strong></td>
<td>-</td>
<td>H8a</td>
</tr>
</tbody>
</table>

Table 1. Summary of research hypotheses.
3 Research design

In this chapter, an overview of the research strategy, research approach and methods of implementation is introduced.

3.1 Research purpose

The major intention of this study is to contribute to the efforts done in the research community and provide an understanding about the influence of culture on EPS user acceptance through determining the relations between variables in the research model. In particular, this study expands on Srite and Karahana’s research in 2006 with qualitative research.

3.2 Research strategy

Based on the assumptions derived from reviewing prior studies, which is that culture influences user acceptance at the individual level, this study aims to explain how cultural variables impact user acceptance of electronic payment systems. As a widely used worldview in social science, interpretivism is the worldview of this study based on research purpose (Creswell, 2014). Furthermore, interpretivism research always aligns with deductive research (Creswell, 2014). It requires suitable approaches to validate the hypotheses and propositions.

3.3 Research approach

In Srite and Karahana (2006)’s study, it used quantitative approaches, and it suggests that qualitative research be used for achieving in-depth results.

Based on the interpretivism worldview, this study engages in both quantitative research and qualitative research, and the quantitative approach is conducted before qualitative approach, they are sequential. Qualitative research is based on the results of quantitative research.

Applying statistics in quantitative modelling analysis, such as Structure Equation Modelling can display the results visually. To validate the research model, using the advanced statistics tool in statistics can reduce some insignificant relations between variables, which decrease the difficulties of qualitative research, but increase the reliability of results with double validations. The quantitative analysis can simplify the research model and reduce the difficulties of text analysis in qualitative analysis part. Moreover, to support an “extensive and in-depth description of research questions”, conducting a case study is required (Yin, 2014, pp.9-10). The most important benefit of a case study in this research is expanding the source of information with some direct data gathering, such as through interviews and observation records (Yin, 2014, pp.9-10). Conducting a case study can make research closer to the real world as an empirical inquiry (Yin, 2014, p.16). To address Yin’s suggestions mentioned above (2014, pp.3-4) and the purpose of this study – explaining “how” social phenomena work on user behaviour intention – case study research is required.
3.4 Research framework

According to Creswell (2014), literature study aims to understand a topic and its background, which should be the first stage of research. With the help of a literature review, constructing a research model and deducing hypotheses are achieved (Creswell, 2014). In a study with two approaches, the order of them is important to the research (Creswell, 2014). According to the purpose and the research questions, quantitative and qualitative approaches are sequential. After aims are indicated, the data collection and analysis for both approaches should be conducted in flow (Creswell, 2014). Through validating research model, and discussing the results, a clearer map of outcomes is presented, which provides more ideas for further work (Creswell, 2014).

Based on above, a work-flow chart can be shown as below:

![Diagram of Research Work-flow]

Figure 2. Research work-flow.

3.5 Data collection methods

The summary of a literature provides the background. The literature was searched through Google Scholar and One Search, an academic searching engine provided by Linnaeus University. Conducting a questionnaire and interviews are the two methods used for collecting data in quantitative and qualitative studies.
3.5.1 Questionnaires

Questionnaires are the most used method for collecting data in quantitative research, through describing the key variables and their relations in complex situations (Creswell, 2014). Thus, there are two core questions that need to be answered first. What should be included in the questionnaire? And how to reach the samples (how to send the questionnaire to target groups)?

3.5.1.1 Content design of questionnaire

To design a questionnaire, the researcher sought to get some guidelines on the web pages of Linnaeus University. But there is no instruction provided for a questionnaire design. Therefore, the design guide provided by Loughborough University has been chosen. According to the guide, the first step is to determine what we want to know. In the guidelines, a clear instruction is provided in relation to this. As shown in the Appendix A (p.72), the instruction should state who the researcher is, the purpose of the research, how the responses will be used, how to answer the questionnaire, and how to return the questionnaire. The determinants of the focus group should be limited.

- **Population**

On the page, Populations-and-samples of Stat Trek (2015) Population is all the members of a particular race or class in a specific case. Based on the purpose, research model and hypotheses in the case, the population is all the LNU campus students in Växjö. Because the current study aims to explain the possible cultural factors that might affect the students’ behaviour intention to accept PayEx or not.

- **Samples**

On the page, Data-collection-methods of Stat Trek (2015), it mentions non-probability sampling method can be chosen to collect data for the sake of convenience and cost. The samples are voluntary one, made up of self-selected people who took part in this survey (Stat Trek, 2015). Generally, these participants have an interest in the topic of this study (Stat Trek, 2015). But the probability of each population element was not known before conducting the investigation (Stat Trek, 2015). Based on the definition of population in this case, the samples are some LNU campus students in Växjö, who take part in the questionnaire survey.

- **Variable scales and questionnaire**

Using “general principles” and a “question order” (Loughborough University), closed questions have been designed. Some items describing variables are presented in a scale in preparation for the compiling of statistics and follow-up analysis. A Likert scale (1932) is used to measure attitudes, with five degrees of participants’ agreement used for a specific topic: “strongly disagree”, “disagree”, “neither”, “agree”, and “strongly agree” (Allen and Seaman, 2007). This study uses a range of 1–5 points to present the extent of agreement. For example, “strongly disagree” is represented as one point. Rather than the Likert scale with 1-7points, this one with only five scores is clearer to responses for understanding and responding the questionnaire. There are three scales included in the
questionnaire. They are cultural influence scale, technology acceptance scale and personal norms.

In the work of McCoy, et al. (2005, p.223), scales of measuring cultural influence at the individual level, as designed by Dorfman and Howell (1988) and adapted from Hofstede in 1980, are quoted. According to this research model, mentioned in Figure 1 (p.8), four variables need to be measured, three from Dorfman and Howell (1988), and one adapted from Hofstede and Bond (1988). Although there were five to six items for each variable in Dorfman and Howell’s (1988) scale, an average three of them are chosen and modified for this study.

To distinguish between different items, these items are named as “Initial of variable”+ “Item’s number”. For example, the second item of the individualism/collectivism variable is named as IC2. Similarly, represents the uncertainty avoidance variable, MF represents the masculinity/femininity variable, LO represents the long-term/short-term orientation variable, and PU, PEU, SI, FC are intervening variables and BI represent the dependent variables in the user acceptance scale. Each variable have three or four items in scales.

For example, as shown in Table 2, for the individualism/collectivism variable, these three items are numbered from IC1 to IC3. IC1 comes from the third item of Dorfman and Howell’s work (1988), “Being accepted by the members of your work group is very important” (McCoy, et al., 2005, p.223). Higher scoring for these items means the individual is collectivist, giving an “agree” or “strongly agree” answer. But if an individual scores lower in this item, he more tends to individualistic, giving a “disagree” or “strongly disagree” answer. IC2 relates to No. 4 item in Dorfman and Howell’s (1988) work, and the relations between the scales in in their work.
sensitively.

Uncertainty Avoidance (UA)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UA1</td>
<td>Normal regulations are helpful for guiding my behaviour.</td>
<td>No.10</td>
<td>“Standard operating procedures are helpful to employees on the job.”</td>
</tr>
<tr>
<td>UA2</td>
<td>Clear and detailed instruction is important to me.</td>
<td>No.11</td>
<td>“Instructions for operations are important for employees on the job.”</td>
</tr>
<tr>
<td>UA3</td>
<td>I always need a clear list and the requirements to know what I should do.</td>
<td>No.7 &amp;9</td>
<td>“It is important to have job requirements and instructions spelled out in detail so that employees always know what they are expected to do.”</td>
</tr>
</tbody>
</table>

Long-term/short-term Orientation (LO)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LO1</td>
<td>I never give up learning new things.</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>LO2</td>
<td>I can spend a long time in achieving my goals.</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>LO3</td>
<td>I can compromise to reach my aim.</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Source: McCoy, et al. (2005, pp.211-224)

Table 2. Cultural influence scale.

Furthermore, the technology acceptance scale is designed according to the items mentioned by Venkatesh, et al. (2003) and Srite and Karahanna (2006). Similar to prior studies on technology acceptance, such as Xie and Lin’s (2014), scale items of technology acceptance section are modified through combining them with the case study. Details of the scale are shown in Table 3 as below.

<table>
<thead>
<tr>
<th>Variables</th>
<th>In this study</th>
<th>Venkatesh et al. (2003) Srite and Karahanna (2006)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Num</td>
<td>Items</td>
</tr>
<tr>
<td>Perceived usefulness (PU)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PU1</td>
<td></td>
<td>I find PayEx useful for paying.</td>
</tr>
<tr>
<td>PU2</td>
<td></td>
<td>Using PayEx enables me to pay more conveniently.</td>
</tr>
<tr>
<td>PU3</td>
<td></td>
<td>Using PayEx increases my efficiency.</td>
</tr>
<tr>
<td>PU4</td>
<td></td>
<td>Using PayEx enables me to pay safely and accurately without mistakes.</td>
</tr>
<tr>
<td>Perceived ease of use (PEU)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEU1</td>
<td></td>
<td>I find PayEx easy to use.</td>
</tr>
<tr>
<td>PEU</td>
<td>PEU2</td>
<td>PEU3</td>
</tr>
<tr>
<td>-----</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td></td>
<td>Learning how to use PayEx is easy for me.</td>
<td>My interaction with PayEx is clear and understandable.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social Influence (SI)</th>
<th>S1</th>
<th>S1</th>
<th>S1</th>
<th>S1</th>
<th>S1</th>
<th>S1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI1</td>
<td>People who may influence my behaviour, such as my friends, classmates and teachers, suggest I should use PayEx.</td>
<td>SN1</td>
<td>“People who influence my behaviour think that I should use the system.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI2</td>
<td>I use PayEx on my own.</td>
<td>Affect 1</td>
<td>“I like working with the system.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI3</td>
<td>Professors, librarians, and other department workers recommend using PayEx.</td>
<td>SF2</td>
<td>“The senior management of this business has been helpful in the use of the system.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI4</td>
<td>The university requires using PayEx. So I have to use it.</td>
<td>SF4</td>
<td>“In general, the organization has supported the use of the system.”</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Facilitating Conditions (FC)</th>
<th>FC1</th>
<th>FC2</th>
<th>FC3</th>
<th>FC4</th>
<th>PBC2</th>
<th>PBC3</th>
<th>FC1</th>
<th>FC3</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC1</td>
<td>I have the necessary devices to use PayEx.</td>
<td>I know how to use PayEx.</td>
<td>There is a clear guidance about using PayEx on a website and it can be found easily</td>
<td>I can contact a specific person or an organization for help if I have difficulties in using PayEx.</td>
<td>“I have the resources necessary to use the system.”</td>
<td>“I have the knowledge necessary to use the system.”</td>
<td>“Guidance was available to me in the selection of the system.”</td>
<td>“A specific person (or group) is available for assistance with system difficulties.”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Behavioral Intention (BI)</th>
<th>BI1</th>
<th>BI2</th>
<th>BI3</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI1</td>
<td>I will use PayEx in future.</td>
<td>“I intend to use the system in the next &lt;n&gt; months.”</td>
<td>“I predict I would use the system in the next &lt;n&gt; months.”</td>
</tr>
<tr>
<td>&amp; BI3</td>
<td>“I plan to use the system in the next &lt;n&gt; months.”</td>
<td>“I intend to use a PC frequently during my studies”</td>
<td>“I predict I would use the system in the next &lt;n&gt; months.”</td>
</tr>
<tr>
<td>BIU2</td>
<td>“I intend to use the system in the next &lt;n&gt; months.”</td>
<td>“I intend to use a PC frequently during my studies”</td>
<td>“I predict I would use the system in the next &lt;n&gt; months.”</td>
</tr>
</tbody>
</table>

Source: Venkatesh, et al. (2003, pp.454 and 460); Srite and Karahanna (2006, p.703)
Table 3. Technology acceptance scale.
Personal norms are the records of participants’ basic information in a case study situation, such as nationality, gender, place where they grew up and received education, education level in LNU, and which department they are attached to. These personal norms can be used for picking out respondents to ensure they are LNU students in Växjö campus.

3.5.1.2 Online survey, social network and mobile devices

In the guide for questionnaire design (Loughborough University), a simple comparison of an email and print questionnaire is provides. This indicates email questionnaires can save both on time and money, and is easy to use for researchers and respondents (Loughborough University). Meckel, et al. (2005) and Middleton, et al. (2014) found similar results. They thought (Meckel, et al., 2005) that the quality of replies between e-mails or other web-based survey and paper-based questionnaire do not vary much, and a web-based survey has the advantage of saving time (Middleton, et al., 2014) and money (Middleton, et al., 2014). In particular, online responses are easier to save and import into statistical software for analysis than traditional paper-based questionnaires (Meckel, et al., 2005). Furthermore, some sociologists suggest the use of the Internet for communication and information purposes (Middleton, et al., 2014). Middleton, et al. (2014) discuss several online survey services and software packages, and argue that online survey research provides greater access to special groups or individuals for research segments than traditional approaches.

But they mention some issues need more attention, such as sampling and access (Middleton, et al., 2014). As the Internet has wide accessibility, how to keep responses confined to the samples was critical (Middleton, et al., 2014). To prevent an overlap of responses, only an online version was available in this research, and each IP address could submit the response only once. Some administrators of focus groups can provide members’ email addresses to help researchers (Middleton, et al., 2014). Seeking to ask help from managers is helpful for ensuring research results are accurate. But if it fails, limiting respondents’ access can be critical. Some online services provide access to specific populations (Middleton, et al., 2014). Some of them can limit access to samples. Thus, an online survey service with the feature of a limiting IP address, accessed only through a link and bar code, has been chosen for this research.

As online social networks are developing rapidly, several quantitative studies in informatics have collected data through online social networks, looking at content-sharing behaviours and impact (Abdesslem, et al., 2012). Abdesslem, et al. (2012) discuss the reliability of social networks for data collection, and found research based on social networks could yield more data than other methods. But content sharing behaviour existed between the users, and between the users and the researchers (Abdesslem, et al., 2012). That meant the data collection method might have an effect on data reliability if users shared invitation links to others who were not part of the sample group. Thus, if a researcher chose to collect data through announcing or publishing links in a social network, they have to be careful about viewers’ sharing behaviour.

Furthermore, if a mobile device can connect to the Internet, the mobile device can respond to online surveys as a medium similar to computers (Middleton, et al., 2014). That is not to collect overlapping data, but to move some responses from computers to
mobile devices, and thereby encourage more participants to engage in the research (Middleton, et al., 2014). Thus, ensuring the answers are unique and that a user chooses only one device for answering the questionnaire are required. Therefore, a personal norms section is a significant component in the questionnaire.

3.5.2 Interviews

An unstructured interview method was chosen for collecting qualitative data in this study, which is an important source of evidence collection in a case study (Yin, 2014, p.110). This kind of interview aims to “elicit rich, detailed material that can used in analysis” (Frechting and Sharp, 1997). The guideline for interviewing (p.75) was designed according to the research model and Yin’s suggestions (2014, pp.112-113).

The samples were chosen before execution through a stratified sampling method (Stat Trek, 2015). In stratified sampling, the population is divided into national groups, and for each national group, a man and a woman respondent are randomly selected. Thus, within each group, a probability sample is selected based on Populations-and-samples of Stat Trek (2015). In this case, 10 nations were chosen as typical national groups, based on prior research (Straub, et al., 1997; Srite and Karahanna, 2006) and the convenience of reaching them. They are: Iran, Germany, Italy, Spain, China, Japan, Sweden, the U.S.A., France and Holland.

3.6 Data analysis methods

Based on the approaches chosen in this study, different analysis methods were required for the different types of data.

3.6.1 Questionnaire data analysis

IBM SPSS Statistics 19 and LISREL 8.70 are tools for quantitative analysis in analysing questionnaire responses. Descriptive statistics, item analysis, factor analysis, reliability analysis and structural equation modelling were conducted.

3.6.1.1 Descriptive statistics

Descriptive statistics illustrates the primary situation of responses, such as the sample size and the maximum, minimum and variance. The sample size summarizes the total number of responses. The maximum and minimum can be used for calculating the range of each item, which equals the result of the largest value minus the smallest (Stat Trek, 2015). The population variance = Σ (ith element from the population – population mean)² / number of elements in the population (Stat Trek, 2015).

3.6.1.2 Item analysis

The aim of item analysis is to pick out the items that cannot be distinguished by participants or do not have significant relation to a study. Through independent sample t-testing, some items were deleted and were not used in following steps if their significance (Sig.) value was over 0.05.
3.6.1.3 Factor analysis

Factor analysis can reduce the number of variables to a few comprehensive indexes (or latent variables), which reflects a kind of dimension reduction. There are only high correlated variables remaining after dimension reduction. To conduct a complementary factor analysis, three sections are required: KMO and Bartlett’s Sphericity Test, the number of determining factors, and explaining the percentages of the results. The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) is to test the suitability of a case study for conducting factor analysis. The value of KMO is closer to 1, the better the factor analysis. Bartlett’s Sphericity Test is similar to a KMO measurement.

3.6.1.4 Reliability analysis

Reliability analysis is used to test the stability and internal consistency of results. Cronbach’s Alpha is used in general. For greater detail, the value of Alpha should be between 0 and 1, and the closer to 1 it is, the better the reliability.

3.6.1.5 Structural Equation Model (SEM)

Linear correlation analysis is the normal approach for exploring relations between variables. But more than two variables exist in the research model, which cannot be processed using a linear correlation analysis. Thus, structural equation modelling is chosen. It can process several dependence variables at the same time, and compare or evaluate different theoretical models. SEM allows the measuring of error of the independent and dependent variable, and greater flexibility for measurement.

With the help of LISREL 8.70, the goodness of fit of the research model is calculated. The path diagram presents whether detailed relations between variables are positive or negative and if they can be used for testing the hypotheses.

3.6.2 Interview data analysis

In contrast to statistical analysis, qualitative analysis has few formulas, and is more based on researchers’ empirical thinking and consideration of alternative interpretations (Yin, 2014, p.133). In the fifth edition of Yin’s work (2014, pp.143-169), five analytic technologies, such as pattern matching, explanation building and time-series analysis, and four key points are presented, for conducting a high-quality analysis. To analyse the data, questions and identified evidence addressing these questions are a good starting point for analysis (Yin, 2014, p.134).

As Yin notes (2014, p.147), explanation building is used for explaining a set of causal links about “how” or “why” for something occurring. Qualitative methods are aimed at adding in-depth explanations to a topic. The main result is a clear and reliable model for introducing the relations between variables. Based on the above, explanation building (Yin, 2014, p.147) is applied as an analysing technology for processing interview data. There are five steps in the qualitative section.

In line with the series of work on explanation building (Yin, 2014, p.149), the five steps are shown as below:
Firstly, defining the initial theoretical propositions is based on the results of the statistics analysis and the improved research model. Secondly, categorizing interview data is done via addressing initial propositions and research questions. Then this study compares the interview data with initial propositions and revises the propositions. Other evidence details are then discussed as supplementary issues.

Although the explanation building mentioned in Yin’s work (2014, p.149) should include a series of cases for explanation purposes, the results of this study can be applied and explained in more cases in further, future work.

3.7 Ethical considerations

Generally, the copyright on prior studies is protected by indicated materials information and sources (Ess, 2013). This report will be published in DIVA, which contains plagiarising checking software.

In particular, Alcser, et al. (2011) present six guidelines for ethical consideration in cross-cultural surveys. Their work gives researchers a widely accepted standard for achieving ethical, professional and scientific considerations during implementing, disseminating and reporting on the process of studies (Alcser, et al., 2011, p.1).

According to the guidelines, this study protects participants’ rights of free will, privacy and confidentiality (2011, p.4). Thus, all the participants in this study decided to participate by themselves. None of the records will be published at any time without their permission. To protect their rights and keep the data original, a statement has been provided, and consent was received from the various subjects before the data collection began. The statement includes the description of the research, the aim of collecting the data, the type of data, and how to collect and process data.

This study was conducted in a cross-cultural environment, to “maintain the sensitivity to cultural and social differences” (Alcser, et al., 2011, p.6). Although not using one’s native language can increase misunderstandings in both the questionnaire survey and the interview process, the research only published and communicated in English despite the researcher’s lack of language skills. Another point mentioned by Alcser, et al. (2011, p.7) is avoiding sensitive cultural issues if possible. With these considerations in mind, nothing about the topic was collected in the study.

Alcser, et al. thought conducting or managing research should follow professional standards in all stages of research (2011, p.10). This study was conducted in accordance with the strategies of Creswell (2014) and Yin (2014) in terms of its methodology and the whole process of study. In addition, the name and contact numbers for the researcher were posted on the participation statement.

Alcser, et al. (2011, p.12) considered ethics to be at the reporting stage. To maintain the data and reporting access, the main data are shown in the Appendix B, C and D, and the paper will be stored in DIVA.

In maintaining the quality of the research (Alcser, et al., 2011, p.15), especially in data collection and analysis stages, reliability analyses and validity discussion were during this study.
Finally, according to Alcser, et al. (2011, p.16), the gathering of document materials and procedures must be following through learning and considering ethical protocols. This section is presented at the end of the research design section.
4 Data collection and description of samples

This chapter presents the conducting of the data collection and a description of the collected samples.

4.1 Conducting of data collection

Following the completion of the research design, data collection was conducted. The online questionnaire was developed with the free web-based questionnaire service provider, “wenjuanwang.com”, bearing in mind the sampling and access issues.

Unfortunately, administrators cannot provide students’ email addresses, in accordance with regulations. To encourage participants, invitation letters were printed and sent to mail boxes in Växjö campus. In the letter and on the poster, the link and bar code of the questionnaire were given, and the research institution was named as well. At the same time, the researcher published the invitation letter and institution on the main page of the “Växjö Campus Group” on Facebook. A statement indicating what the focus group would constitute was shown before the link and bar code. Respondents could then reach the questionnaire through scanning the barcode with a mobile device or clicking on the link directly using a computer. Only one submission could be made per IP address, whether it was a computer or mobile device.

For the in-depth research, 20 users of electronic payment systems were invited to take part in interviews. They were from 10 countries: Iran, Germany, Italy, Spain, China, Japan, Sweden, the U.S.A., France and Holland.

4.2 Description of samples

This part descripts samples collected through online questionnaire and interview.

4.2.1 Questionnaire survey

The collection of the questionnaires was done from April 21st to May 10th, 2014. All the responses is valid without repeat count ensured by checking in personal section of the questionnaires. There were only 47 responses, 20 men and 27 women.

![Figure 3. Gender of students.](image)

Chinese and Swedish nationals constituted more than half of the 47 responses.
<table>
<thead>
<tr>
<th>Nationality</th>
<th>Number</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>1</td>
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<td>2.1</td>
</tr>
<tr>
<td>Chinese</td>
<td>14</td>
<td>29.8</td>
<td>31.9</td>
</tr>
<tr>
<td>Dutch</td>
<td>2</td>
<td>4.3</td>
<td>36.2</td>
</tr>
<tr>
<td>France</td>
<td>2</td>
<td>4.3</td>
<td>40.4</td>
</tr>
<tr>
<td>German</td>
<td>5</td>
<td>10.6</td>
<td>51.1</td>
</tr>
<tr>
<td>Greek</td>
<td>1</td>
<td>2.1</td>
<td>53.2</td>
</tr>
<tr>
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<td>3</td>
<td>6.4</td>
<td>59.6</td>
</tr>
<tr>
<td>Japanese</td>
<td>2</td>
<td>4.3</td>
<td>63.8</td>
</tr>
<tr>
<td>Mexican</td>
<td>2</td>
<td>4.3</td>
<td>68.1</td>
</tr>
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<td>2.1</td>
<td>70.2</td>
</tr>
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<td>Spanish</td>
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<td>2.1</td>
<td>74.5</td>
</tr>
<tr>
<td>Swedish</td>
<td>10</td>
<td>21.3</td>
<td>95.7</td>
</tr>
<tr>
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<td>2.1</td>
<td>97.9</td>
</tr>
<tr>
<td>Ukrainian</td>
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<td>2.1</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Nationality of students.

Although they are studying in Linnaeus University, they are not in the same level. The number of bachelor students was a little greater than master’s students.

<table>
<thead>
<tr>
<th>Education</th>
<th>Number</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor</td>
<td>25</td>
<td>53.2</td>
<td>53.2</td>
</tr>
<tr>
<td>Master</td>
<td>22</td>
<td>46.8</td>
<td>100</td>
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<tr>
<td>Total</td>
<td>47</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 5. Education level of students in LNU.

Obviously, these students’ majors are different as well. Some of them may not familiar with information technology.

<table>
<thead>
<tr>
<th>Department</th>
<th>Number</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Economics Finance</td>
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<td>25.5</td>
</tr>
<tr>
<td>Management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Science</td>
<td>4</td>
<td>8.5</td>
<td>34</td>
</tr>
<tr>
<td>Design</td>
<td>2</td>
<td>4.3</td>
<td>38.3</td>
</tr>
<tr>
<td>Culture</td>
<td>1</td>
<td>2.1</td>
<td>40.4</td>
</tr>
<tr>
<td>Education</td>
<td>1</td>
<td>2.1</td>
<td>42.6</td>
</tr>
<tr>
<td>Electrical Engineer</td>
<td>1</td>
<td>2.1</td>
<td>44.7</td>
</tr>
<tr>
<td>Engineering</td>
<td>2</td>
<td>4.3</td>
<td>48.9</td>
</tr>
<tr>
<td>Language</td>
<td>2</td>
<td>4.3</td>
<td>53.2</td>
</tr>
<tr>
<td>Faculty Technology</td>
<td>1</td>
<td>2.1</td>
<td>55.3</td>
</tr>
</tbody>
</table>
### Table 6. Departments of students in LNU.

<table>
<thead>
<tr>
<th>Department</th>
<th>Students</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities Sociology</td>
<td>2</td>
<td>4.3</td>
<td>59.6</td>
</tr>
<tr>
<td>Informatics</td>
<td>4</td>
<td>8.5</td>
<td>68.1</td>
</tr>
<tr>
<td>International AD</td>
<td>2</td>
<td>4.3</td>
<td>72.3</td>
</tr>
<tr>
<td>Literature</td>
<td>2</td>
<td>4.3</td>
<td>76.6</td>
</tr>
<tr>
<td>Logistics Supply Chain</td>
<td>2</td>
<td>4.3</td>
<td>80.9</td>
</tr>
<tr>
<td>Mathematics</td>
<td>1</td>
<td>2.1</td>
<td>83</td>
</tr>
<tr>
<td>Technology</td>
<td>6</td>
<td>12.8</td>
<td>95.7</td>
</tr>
<tr>
<td>Nurse</td>
<td>1</td>
<td>2.1</td>
<td>97.9</td>
</tr>
<tr>
<td>Psychology</td>
<td>1</td>
<td>2.1</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>47</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

#### 4.2.2 Interviews

Between April 25th and May 2nd, 2014, 20 students took part in the interview. They are from ten countries, Germany, Italy, Spain, China, Japan, Sweden, the U.S.A., Holland, Iran and France. In the record of the interviews and following the text analysis, abbreviated of international domain names were applied to refer to the name of nations, such as CN is refer to China. One German man and one German woman were interviewees. Six students were using PayEx (one American, two Chinese, two Japanese and one German). Four of them were master’s students and the remainder were bachelor's students at Linnaeus University (only four of the students programmes were one or two-year master’s programmes). They expressed different reasons for using electronic payment systems, and these will be analysed and discussed. A comparative results table is available below, which presents general information on the interviewees and their responses.

Some interpretation to this table:

a. Nationality: Iran-IR; Germany-DE; Italy-IT; Spain-ES; China-CN; Japan-JP; Sweden-SE; the U.S.A.-USA; France-FR; Holland-NL.

b. Gender: M-Male; F-Female.

c. Use PayEx: N-No; Y-Yes.

d. In other parts of the table, national codes and gender within “(“and”)” indicate the person who said these words.

e. CI – Whether culture influences personal decision-making?

f. How – how does culture affect personal decision-making?
<table>
<thead>
<tr>
<th>Nationality</th>
<th>IR</th>
<th>DE</th>
<th>IT</th>
<th>ES</th>
<th>CN</th>
<th>JP</th>
<th>SE</th>
<th>USA</th>
<th>FR</th>
<th>NL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Education</td>
<td>M</td>
<td>M</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>M</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Use Online Payment system</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Use PayEx</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

**Explanation**

Yes:
1. This university required us to use the system. (DE F; JP F; CN M; SE F)
2. With PayEx, I can print anytime I want. (SE F; CN M)
3. My programme requires us to write some reports. And we need to buy some literature. But literature is so expensive. Printing them is a good choice. I have no choice, if I have to print or copy books in the library. (CN F)
4. My friend told me to use it when I came here. And he helped me to register an account. (CN M; JP M)

No:
1. My department offers free printing and copy, I do not need to have a PayEx account. (ES M and F; FR F; SE M)
2. I sent my certification to the service department of PayEx for verification, but got no reply. (USA F)
3. I can find digital books or papers via the Internet, so why printing? (USA M; SE M; FR M; NL M; DE M)
4. Before the last semester, I had some free credits in my account in each semester for printing. But I have to pay now. I can save money by reading the digital version. (IR M; NL F)
5. I have a printer myself. (IT M; NL M)
6. I prefer paying with credit cards or bankcards than through a third party. Although the system is secure, I can pay with more simple and direct methods. (IR M)
7. My friend has an account. If I need to, I can use his account and pay him money. (IT F) I will not stay for such a long time at LNU, only one semester for exchange, and there is no need to have an account. (NL F; FR F)
8. It is too difficult to understand how it works or how to register and save money. (IR F)

**Advices OR Condition of using PayEx**

1. They have to level up their service. (USA F). My friend told me her story. She saved 10 euro, but the system only accepts SEK. Her money was lost and only showed 10 SEK. The service department did not give the lost money to her. (DE F)
2. International credit cards may not be accepted by the system, such as my Chinese bank credit card. (CN )
3. Wide usage. Such as not for the printing only; PayEx can be used for paying the tuition fee. (IR M)
4. A clearer and simpler operation. (IR F; CN F; IT F)

**CI**

Y Y Y Y Y Y Y Y Y Y N Y Y Y N Y Y Y N Y

**How**

YES: The basic worldview. The attitude to the same thing may be different. The virtue and status of cultural will impact behaviour, such as helping others.

NO: The most significant things are personal experiences and disposition.

Table 7. Brief summary of the interviews.
5 Analysis

This chapter provides details of the statistical analysis conducted by the use of SPSS and LISREL, and the qualitative analysis based on the result of the statistical analysis performed.

5.1 Analysis of questionnaire

In this section, the statistical procedure is followed and the results achieved by using SPSS 19.0 and LISREL 8.70 are presented. Descriptive statistics, factor analysis and reliability analysis are given for both scales. The Structural Equation Model and structural parameters are applied as follows to improve the research model.

Based on the design of questionnaire mentioned in Table 2 (p.19), there are two or three items are designed to test the relationships between variables. To distinguish between these different items, these items are named as “Initial of variable”+ “Item’s number”. For example, the second item of the individualism/collectivism variable is named as IC2.

5.1.1 Descriptive statistics

The follow section illustrates the basic situation regarding responses in Table 8 and Table 9 (p.31). In the cultural influence scale, the minimum response for UA2, UA3, LO2 and LO3 was 2.00. That means no students expressed a “strongly disagree” for these four items. These students thought the instruction and lists would bring some benefits to work performance, and they did not have a negative attitude towards learning new things to reach their aims.

<table>
<thead>
<tr>
<th>Descriptive Stats</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC1(^1)</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>3.7872</td>
<td>1.41323</td>
<td>1.997</td>
</tr>
<tr>
<td>IC2</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>3.7234</td>
<td>1.39412</td>
<td>1.944</td>
</tr>
<tr>
<td>IC3</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>2.5319</td>
<td>1.28285</td>
<td>1.646</td>
</tr>
<tr>
<td>MF1(^2)</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>2.8085</td>
<td>1.27924</td>
<td>1.636</td>
</tr>
<tr>
<td>MF2</td>
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<td>5.00</td>
<td>2.8936</td>
<td>1.44815</td>
<td>2.097</td>
</tr>
<tr>
<td>MF3</td>
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<td>1.00</td>
<td>5.00</td>
<td>3.1277</td>
<td>1.07576</td>
<td>1.157</td>
</tr>
<tr>
<td>UA1(^3)</td>
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<td>5.00</td>
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<td>.95456</td>
<td>.911</td>
</tr>
<tr>
<td>UA2</td>
<td>47</td>
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<tr>
<td>UA3</td>
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<tr>
<td>LO1(^4)</td>
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<td>5.00</td>
<td>3.7021</td>
<td>.88256</td>
<td>.779</td>
</tr>
</tbody>
</table>

\(^1\) IC1 is the first item of the individualism/collectivism variable in cultural influence scale;  
\(^2\) MF1 is the first item of the masculinity/femininity variable in cultural influence scale;  
\(^3\) UA1 is the first item of the uncertainty avoidance variable in cultural influence scale;  
\(^4\) LO1 is the first item of the long-term/short-term orientation variable in cultural influence scale.
### Descriptive Stats

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
</tr>
</thead>
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<tr>
<td>IC1</td>
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<tr>
<td>MF3</td>
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<td>5.00</td>
<td>3.1277</td>
<td>1.07576</td>
<td>1.157</td>
</tr>
<tr>
<td>UA1</td>
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<td>1.00</td>
<td>5.00</td>
<td>3.0426</td>
<td>0.95456</td>
<td>0.911</td>
</tr>
<tr>
<td>UA2</td>
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<td>2.00</td>
<td>5.00</td>
<td>4.3191</td>
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<td>1.080</td>
</tr>
<tr>
<td>UA3</td>
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<td>5.00</td>
<td>3.6596</td>
<td>1.02738</td>
<td>1.056</td>
</tr>
<tr>
<td>LO1</td>
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<td>2.00</td>
<td>5.00</td>
<td>3.7021</td>
<td>0.88256</td>
<td>0.779</td>
</tr>
</tbody>
</table>

Table 8. Descriptive statistics of cultural influence scale.

In Table 9 of the technology acceptance scale, all of the items have the same minimum (1.00) and maximum (5.00), without specific options being provided. That means users have different views about these items without preference.

### Descriptive Stats

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>PU1</td>
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<td>1.00</td>
<td>5.00</td>
<td>2.6809</td>
<td>1.18149</td>
<td>1.396</td>
</tr>
<tr>
<td>PU2</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>2.6809</td>
<td>1.28717</td>
<td>1.657</td>
</tr>
<tr>
<td>PU3</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>2.5319</td>
<td>1.31630</td>
<td>1.733</td>
</tr>
<tr>
<td>PU4</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>2.8936</td>
<td>1.35509</td>
<td>1.836</td>
</tr>
<tr>
<td>PEU1</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>2.8511</td>
<td>1.30182</td>
<td>1.695</td>
</tr>
<tr>
<td>PEU2</td>
<td>47</td>
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<td>5.00</td>
<td>3.1489</td>
<td>1.16056</td>
<td>1.347</td>
</tr>
<tr>
<td>PEU3</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>2.9787</td>
<td>1.27670</td>
<td>1.630</td>
</tr>
<tr>
<td>PEU4</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>3.0638</td>
<td>1.09155</td>
<td>1.191</td>
</tr>
<tr>
<td>SI1</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>2.2340</td>
<td>1.41748</td>
<td>2.009</td>
</tr>
<tr>
<td>SI2</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>2.8936</td>
<td>1.57748</td>
<td>2.488</td>
</tr>
<tr>
<td>SI3</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>2.6383</td>
<td>1.56630</td>
<td>2.453</td>
</tr>
<tr>
<td>SI4</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>3.5957</td>
<td>1.52742</td>
<td>2.333</td>
</tr>
<tr>
<td>FC1</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>3.4681</td>
<td>1.55830</td>
<td>2.428</td>
</tr>
<tr>
<td>FC2</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>3.0000</td>
<td>1.48909</td>
<td>2.217</td>
</tr>
<tr>
<td>FC3</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>3.1277</td>
<td>1.24441</td>
<td>1.549</td>
</tr>
<tr>
<td>FC4</td>
<td>47</td>
<td>1.00</td>
<td>5.00</td>
<td>2.9787</td>
<td>1.35918</td>
<td>1.847</td>
</tr>
</tbody>
</table>

5 PU1 is the first item of the perceived usefulness variable in technology acceptance scale;
6 PEU1 is the first item of the perceived ease of use variable in technology acceptance scale;
7 SI1 is the first item of the social influence variable in technology acceptance scale;
8 FC1 is the first item of the facility conditions variable in technology acceptance scale;
Generally, the mean, variance and standard deviation represented most people’s choices and data distribution. These data are discrete, such as 1, 2, and 5. Although the mean, variance, and standard deviation are almost over 1.00, they had no real value because of its discretion. For example, the mean of IC1<sup>10</sup> (3.7872) shows most users’ choices, but 3.7872 is not “neither” or “agree”. We cannot say that most users chose “neither” or “agree” for IC1. Thus, the mean, variance and standard deviation have no practical significance. The same goes for the information technology acceptance scale. The mean, variance and standard deviation have no practical significance either.

### 5.1.2 Item analysis

Item analysis is conducted with measuring items’ quality, to ensure the statistics to be valid without responses’ misunderstanding towards items in questionnaire (Wu, 2003). In the item analysis, some items were deleted if they could not be distinguished by the responses or did not have a significant relation for this study (Wu, 2003). According to Wu (2003), all of the samples should be ranked based on their total scores. They are divided into two groups. The 27% samples with the highest score are in Group 1. The lowest 27% samples are in Group 2. Then, an independent sample t-test was conducted for each group.

According to Wu (2003), the two items, IC2<sup>11</sup> and MF3<sup>12</sup>, in the cultural influence scale have no statistical significance and should be deleted, because of their significance values (Sig. 2-tailed of IC2 is 0.376 and Sig. 2-tailed of MF3 is 0.866) in Table 10 are more than 0.05 (Wu, 2005). These data will not be used in the subsequent analysis stages.

![Table 9. Descriptive statistics of technology acceptance scale.](image)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI1</td>
<td>47</td>
<td>2.4255</td>
<td>1.36326</td>
<td>2.4255</td>
</tr>
<tr>
<td>BI2</td>
<td>47</td>
<td>2.3191</td>
<td>1.30395</td>
<td>2.3191</td>
</tr>
<tr>
<td>BI3</td>
<td>47</td>
<td>2.3404</td>
<td>1.33964</td>
<td>2.3404</td>
</tr>
<tr>
<td>N</td>
<td>47</td>
<td>1.858</td>
<td>1.795</td>
<td>1.858</td>
</tr>
</tbody>
</table>

<sup>9</sup> BI1 is the first item of the behaviour intention variable in technology acceptance scale;  
<sup>10</sup> IC1 is the first item of the individualism/collectivism variable in cultural influence scale.  
<sup>11</sup> IC2 is the second item of the individualism/collectivism variable in cultural influence scale;  
<sup>12</sup> MF3 is the third item of the masculinity/femininity variable in cultural influence scale.
Table 10. Item analysis of cultural influence scale.

Similarly, in Table 11, the information technology acceptance scale, SI4\textsuperscript{13} is deleted with its significance value (Sig. 2-tailed is 0.081-0.082) over 0.05.

\begin{tabular}{|l|c|c|c|c|c|c|}
\hline
 & Levene's Test for & t test for Equality of & Means \hline
 & F & Sig. & variances & & Std. error & 95\% confidence interval of the Difference \hline
 PU1 & Equal variances assumed & 2.931 & .101 & 5.775 & 22 & .000 & 2.00000 & .34634 & 1.28174 & 2.71826 \hline
 & Equal variances not assumed & . & . & 5.775 & 19.237 & .000 & 2.00000 & .34634 & 1.27571 & 2.72429 \hline
 PU2 & Equal variances assumed & .003 & .956 & 6.384 & 22 & .000 & 2.41667 & .37856 & 1.63158 & 3.20175 \hline
 & Equal variances not assumed & . & . & 6.384 & 21.928 & .000 & 2.41667 & .37856 & 1.63143 & 3.20190 \hline
\end{tabular}

\textsuperscript{13} SI4 is the fourth item of the social influence variable in technology acceptance scale.
### Table 11. Item analysis of technology acceptance scale.

**5.1.3 Factor analysis**

This part consists of three stages, testing KMO and Bartlett’s Sphericity, determining the number of factors, and explaining the percentage of the results and the relations between the items.

**5.1.3.1 Cultural influence scale**

According to Kaiser (1974), if the KMO\(^1\) is less than 0.5, it should be unfavourable for conducting a factors analysis. In the Bartlett’s Test of Sphericity, the significant (Sig.)

---

\(^{14}\) Kaiser-Meyer-Olkin
value should be less than 0.05 (Wu, 2003). If the results of Chi-Square/df is within 1~3, the research can use factor analysis to get a significant outcome.

In Table 12, the KMO of this cultural influence scale is 0.638, which is more than 0.5, the significance (Sig.) value of Bartlett’s Test of Sphericity is 0.000 less than 0.05, and Chi-Square/df is 112.694 / 45 equalling to 2.5043. This is within the valuable area, which illustrates the results based on a factor analysis will be significant.

<table>
<thead>
<tr>
<th>KMO and Bartlett’s test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Olkin Measure of Sampling Adequacy.</td>
<td>.638</td>
</tr>
<tr>
<td>Bartlett’s Test of Sphericity</td>
<td>Appro. Chi-Square</td>
</tr>
<tr>
<td>Sphericity</td>
<td>df</td>
</tr>
<tr>
<td>Sig.</td>
<td></td>
</tr>
</tbody>
</table>

Table 12. KMO test of cultural influence scale.

A Principal Component Analysis is conducted to determine the number of factors. According to Wu (2003), a scree plot should be used to determine the number of factors. As shown as Figure 4, there are 10 components that can be picked out. But behind the fourth component, the eigenvalue tends to decrease in a gently tendency. This means starting from the fifth factor, the difference in the characteristic value is small.

![Scree plot](image)

Figure 4. Scree plot of cultural influence scale.

Furthermore, in Table 13, the cumulative percentage of the factors is 69.300 more than 50 percentage. That means the four factors explains more than a half of the variance. Therefore, choosing four common factors is enough to conduct further analysis, and the construct validity of the scale can be accepted.

<table>
<thead>
<tr>
<th>Total Variance Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
Table 13. Total variance explained of factors in cultural influence scale.

With the help of rotated component matrix of the cultural influence scale shown in Table 14, there are four groups of items. It indicates the four common factors are IC, MF, UA, and LO\textsuperscript{15}, which is consistent with the four independent variables in the research model. It proves these four factors can be seen as real independent variables without correlations.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC1</td>
<td></td>
<td></td>
<td>3.077</td>
<td></td>
<td>3.077</td>
</tr>
<tr>
<td>IC3</td>
<td>3.077</td>
<td>30.772</td>
<td></td>
<td>30.772</td>
<td></td>
</tr>
<tr>
<td>MF1</td>
<td>1.455</td>
<td>14.550</td>
<td>45.322</td>
<td>1.455</td>
<td>14.550</td>
</tr>
<tr>
<td>UA1</td>
<td>1.009</td>
<td>10.092</td>
<td>69.300</td>
<td>1.009</td>
<td>10.092</td>
</tr>
<tr>
<td>UA2</td>
<td>0.807</td>
<td>8.066</td>
<td>77.366</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UA3</td>
<td>0.692</td>
<td>6.918</td>
<td>84.284</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LO1</td>
<td>0.583</td>
<td>5.832</td>
<td>90.116</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LO2</td>
<td>0.338</td>
<td>3.376</td>
<td>97.629</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LO3</td>
<td>0.237</td>
<td>2.371</td>
<td>100.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\textsuperscript{15} IC is individualism/collectivism; MF is masculinity/femininity; UA is uncertainty avoidance; LO is long-term/short-term orientation;
Test of Sphericity is 0.000 less than 0.05, which proves the significance of the factor analysis is available. In particular, the 681.828/153 result is more than 4.456, which illustrates that the factor analysis was suitable to the scale.

<table>
<thead>
<tr>
<th>KMO and Bartlett's Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Olkin Measure of Samplong Adequacy.</td>
</tr>
<tr>
<td>Bartlett’s Test of Sphericity</td>
</tr>
<tr>
<td>df</td>
</tr>
<tr>
<td>Sig.</td>
</tr>
</tbody>
</table>

Table 15. KMO test of technology acceptance scale.

Although we can pick only two factors as shown in Figure 5, the break point cannot be ignored. With the line of the eigenvalue of the scree plot, the rate of decreasing tends to gently from sixth component. Combining this with the research model, five factors were extracted.

![Scree plot of technology acceptance scale.](image)

Figure 5. Scree plot of technology acceptance scale.

In Table 16, the cumulative percentage of the factors is 79.087, which is close to 80% in total. The results should be accepted.

<table>
<thead>
<tr>
<th>Total Variance Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
</tr>
<tr>
<td>Component</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
</tbody>
</table>
Table 16. Total variance explained of factors in technology acceptance scale.

The rotated component matrix of technology acceptance scale is presented in Table 17. In this table, in group 1, both items from PU and PEU are included, which indicated these two variables are connected to each other. In another words, there are some relationships exist between PU and PEU, which proves the hypothesis H6a (p.13) could be exist.

### Rotated Component Matrix

<table>
<thead>
<tr>
<th></th>
<th>Component 1</th>
<th>Component 2</th>
<th>Component 3</th>
<th>Component 4</th>
<th>Component 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>PU1</td>
<td>.740</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PU2</td>
<td>.732</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PU3</td>
<td>.767</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PU4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEU1</td>
<td>.662</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEU2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEU3</td>
<td>.643</td>
<td>.647</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEU4</td>
<td></td>
<td></td>
<td></td>
<td>.823</td>
<td></td>
</tr>
<tr>
<td>SI1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.807</td>
</tr>
<tr>
<td>SI2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16 PU is perceived usefulness; PEU is perceived ease of use;
With the help of factor analysis, four independent variables without correlation relate to cultural influence, IC, MF, UA, and LO\textsuperscript{17}, and four intervening variables and a dependent variable relate to technology acceptance model, PU, PEU, SI, FC and BI\textsuperscript{18}, can be used as common factors in the following research instead of the 28 items in the two scales, to answer the research questions and test hypothesis.

\textbf{5.1.4 Reliability analysis}

In Table 18, the reliability of the cultural influence scale is 0.723 less than 0.75. This means the results can be accepted, but the stability and validity are a bit low.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|}
\hline
\textbf{Reliability Statistics} & \\
\hline
\textbf{Cronbach's} & \textbf{Cronbach's} \\
\textbf{Alpha} & \textbf{Alpha based on} \\
& \textbf{Standard items} \\
\hline
\textbf{Number of} & \\
\textbf{items} & \\
\hline
.723 & .734 & 10 \\
\hline
\end{tabular}
\caption{Reliability statistics of cultural influence scale.}
\end{table}

In Table 19, in comparing the reliability of the technology acceptance scale, the value of Cronbach’s Alpha is 0.949 close to 1. Its stability and validity should be more reasonable than it in the cultural influence scale. The difference between the two scales in reliability could be different, because of the cultural influence scale is more based on their different understanding in cross-cultural context and personal factors, which could impact the reliability. Further, the technology acceptance scale is based on these people’s understandings towards the specific object with less influence from personal background than cultural influence scale.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|}
\hline
\textbf{Reliability Statistics} & \\
\hline
\textbf{Cronbach's} & \\
\textbf{Alpha} & \\
\hline
\textbf{Number of} & \\
\textbf{items} & \\
\hline
\textbf{10} & \\
\hline
\end{tabular}
\caption{Reliability statistics of technology acceptance scale.}
\end{table}

\textsuperscript{17} IC is individualism/collectivism; MF is masculinity/femininity; UA is uncertainty avoidance; LO is long-term/short-term orientation;

\textsuperscript{18} PU is perceived usefulness; PEU is perceived ease of use; SI is social influence; FC is facility conditions; BI is behaviour intention.
<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Cronbach’s Alpha based on Standard items</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.949</td>
<td>.951</td>
<td>18</td>
</tr>
</tbody>
</table>

Table 19. Reliability statistics of technology acceptance scale.

5.1.5 Structural Equation Model

To test the goodness of fit of research model and examine the hypotheses identified in chapter 2 (pp.4-14), a structural equation model is conducted using LISREL 8.70. In this section, the structural equation models for both scales and the research model are presented. A path analysis is the critical stage for hypotheses analysis.

5.1.5.1 Output of model

With the help of statistics software, LISREL 8.70, the models for both scales are shown in Figure 6 and Figure 7.

For Figure 6, the output of running path diagram for cultural influence scale is shown as follows.

Goodness of fit statistics
Goodness of fit index (GFI) = 0.90

The goodness of fit index is 0.90 close to 1, which means the scales are reliable and the result should be accepted. This path diagram indicates the items on the left side have a positive impact on the variables at another side. Although the path diagram shows a positive relation exists from IC\textsuperscript{19} to UA\textsuperscript{20}, this is not the key objective of this research, and is not discussed in the following sections. However, the relations within variables relate to cultural influence constitute further work to be explored in the future.

\textsuperscript{19} IC is individualism/collectivism;  
\textsuperscript{20} UA is uncertainty avoidance.
The path diagram for the technology acceptance variables is shown in Figure 7, and the output of the goodness of fit index (GFI) is 0.7. That means the result can be accepted. This path diagram illustrates that all the items on the left side have a positive impact on the variables, which shows the scales are reliable.

Figure 6. Path diagram of cultural influence scale.

Figure 7. Path diagram of technology acceptance scale.
To achieve a clearer path diagram for the research model, a modification is made based on the initial path diagram through applying LISREL\textsuperscript{21}. Some lines with a value of 0.0 are deleted, because of there are no significant relations between them. Only the lines with a number over 1.0 can be saved at this stage. To make the path diagram of research model to be readable, “modification indices”, “T-values test of estimate”, features provided by LISREL\textsuperscript{8.70} are applied for achieving a better goodness of fit. Using a T-values test, if the value of one path is less than 1.96, this value is signed in red to illustrate this line should be deleted as being statistically insignificant. During the process, ten paths are deleted, they are MF→PEU\textsuperscript{22}, MF→SI, MF→FC, UA→PU, UA→PEU, UA→SI, UA→FC, UA→BI, LO→PU, and LO→BI\textsuperscript{21}.

Then the improved research model is shown as follows. These lines between 9 ellipses are the relations proved in this study. The four ellipses on the left are independent variables related to cultural influence, and the up four ellipses on the right side are the intervening variables related to technology acceptance, and the last one on the right side is the dependent variable. Each rectangular represent an item from scale to support independent or dependent variable in ellipse. If the number close to the lines is positive, that means the relation is positive. If the number is negative, the relation is negative.

\textsuperscript{21} A software for statistics or structure equation model.
\textsuperscript{22} MF→PEU is the influence from masculinity/femininity variable on the perceived ease of use variable.
\textsuperscript{23} IC is individualism/collectivism;
MF is masculinity/femininity;
UA is uncertainty avoidance;
LO is long-term/short-term orientation;
PU is perceived usefulness;
PEU is perceived ease of use;
SI is social influence;
FC is facility conditions;
BI is behaviour intention.
Figure 8. The path diagram of the modified model.

The output of the running path diagram is:

Goodness of fit statistics
Goodness of fit index (GFI) = 0.57

The result of goodness of fit index is 0.57, and the possible reason for the lower goodness of index is the small samples size. The larger the sample size, the better the goodness of fit index, and the more reliable the research results in this case.

5.1.5.2 Hypothesis testing and path analysis

According to the path diagram of the modified model, the relations between the variables in the research model are clear.

In the cultural influence scale, IC3\textsuperscript{24} and MF3\textsuperscript{25} are deleted in the item analysis. Therefore, in the individualism/collectivism dimension, more scores tend towards collectivism. Similarly, if there are more scores for masculinity/femininity, the results tend towards masculinity because the item with the femininity tendency (MF3) is deleted.

\begin{itemize}
  \item IC3 is the third item of the individualism/collectivism variable in cultural influence scale;
  \item MF3 is the third item of the masculinity/femininity variable in cultural influence scale;
\end{itemize}
in the item analysis. Furthermore, a higher score in all of the questionnaire items in uncertainty avoidance shows a tendency for a higher degree of uncertainty avoidance. All the items of the long-term/short-term orientation are in the same tendency, which means the higher the score, the closer it is to a long-term orientation.

Based on above, all of the relations that exist between independent variables and intervening variables are positive. The relations between intervening variables and dependent variables are positive as well. There are 16 paths in the modified model, i.e., they are IC→PU\(^{26}\), IC→PEU, IC→SI, IC→FC, IC→BI, MF→PU, MF→BI, LO→PEU, LO→SI, LO→FC, PU→BI, PEU→BI, PEU→PU, SI→BI, FC→BI, and FC→PEU. The results on comparing the paths of the hypotheses identified in Chapter 2 (pp.4-14) with the results paths are shown in Table 20. The tendency represents the relations between the variables. If the tendency of the path diagram is similar to the hypothesis, it means that the hypothesis is supported as correct. The “Null” in the table indicates there is nothing about the tendency of the path.

<table>
<thead>
<tr>
<th>Num.</th>
<th>Hypothesis</th>
<th>Path diagram</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>IC→BI</td>
<td>Positive</td>
<td>IC→BI</td>
</tr>
<tr>
<td>H1a</td>
<td>IC→PU</td>
<td>Positive</td>
<td>IC→PU</td>
</tr>
<tr>
<td>H1b</td>
<td>IC→PEU</td>
<td>Positive</td>
<td>IC→PEU</td>
</tr>
<tr>
<td>H1c</td>
<td>IC→SI</td>
<td>Positive</td>
<td>IC→SI</td>
</tr>
<tr>
<td>H1d</td>
<td>IC→FC</td>
<td>Positive</td>
<td>IC→FC</td>
</tr>
<tr>
<td>H2</td>
<td>MF→BI</td>
<td>Positive</td>
<td>MF→BI</td>
</tr>
<tr>
<td>H2a</td>
<td>MF→PU</td>
<td>Positive</td>
<td>MF→PU</td>
</tr>
<tr>
<td>H2b</td>
<td>MF→PEU</td>
<td>Positive</td>
<td>Null</td>
</tr>
<tr>
<td>H2c</td>
<td>MF→SI</td>
<td>Positive</td>
<td>Null</td>
</tr>
<tr>
<td>H2d</td>
<td>MF→FC</td>
<td>Positive</td>
<td>Null</td>
</tr>
<tr>
<td>H3</td>
<td>UA→BI</td>
<td>Negative</td>
<td>Null</td>
</tr>
<tr>
<td>H3a</td>
<td>UA→PU</td>
<td>Negative</td>
<td>Null</td>
</tr>
<tr>
<td>H3b</td>
<td>UA→PEU</td>
<td>Negative</td>
<td>Null</td>
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</tbody>
</table>

\(^{26}\) IC→PU is the influence from individualism/collectivism variable on the perceived usefulness variable.

IC is individualism/collectivism;
MF is masculinity/femininity;
UA is uncertainty avoidance;
LO is long-term/short-term orientation;
PU is perceived usefulness;
PEU is perceived ease of use;
SI is social influence;
FC is facility conditions;
BI is behaviour intention.
Table 20. Comparison between hypothesis and path diagram.

This table is conducted based on the data in the case, Linnaeus University students’ acceptance towards PayEx, it covered all the significant path by using structure equations model. The structural equation modelling supports some of the hypotheses. The hypothesis about uncertainty avoidance cannot be supported to the extent of the relations that exist for masculinity/femininity and long-term orientation. Based on Table 20 (p.45) and Figure 1 (p.8), the statistics results can be show as below. The research model can be modified as the improved research model in Figure 9.

Figure 9. Improved research model.
Comparing Figure 9 (p.45) with Figure 1 (p.8), the research model is improved with clear relationships between variables. With the help of statistics analysis, it proves collectivism has positive influence on perceived usefulness, perceived ease of use, social influence, facility condition and behavioural intention respectively. It also validates the hypotheses about the relations from masculinity/femininity to perceived usefulness and behavioural intention, and the influence from long-term orientation on perceived ease of use, social influence and facility conditions. The influence from four intervening variables on dependent variables are proved, the same with the two from perceived ease of use to perceived usefulness and facility conditions to perceived ease of use.

5.2 Analysis of interviews

In this section, a text analysis following the designed steps is conducted. More details are presented below.

5.2.1 Case review of PayEx in LNU

PayEx is one of the most advance electronic payment systems, and it is widely accepted in the Nordic area. It provides payment solutions for e-commerce, mobile platforms and physical shopping, such as debt collection and credit management. Linnaeus University is an international university in Sweden. More than 2,000 international students attend it every year.

Since October 2013, PayEx has been the only electronic payment system used for students paying by credit to use wireless printers distributed around the LNU campus. But there are two other choices for students wishing to use printing facilities, printing in the printing office or using one’s own personal printer. To use a printing machine, students need credits to make a payment. Figure 10 shows the use case diagram for student printing.

Figure 10. Use case diagram of student printing in Linnaeus University.
Although there are three choices available to students, one of them, using the printing office, is restricted to several hours a week. But the printers on campus run for 24 hours a day. Instructions for their use can be found in Figure 11.

Four methods are acceptable to buy credits for a PayEx account. They are Visa or MasterCard, bank transfer, PayEx cash card and direct debit. PayEx cash cards are on sale in retail outlets, and direct debits are offered to students doing specific majors subjects. Figure 12 illustrates the process of using the PayEx system.
5.2.2 Definition of initial propositions

To add in-depth explanations to the topic, the qualitative analysis is conducted. Based on Yin’s work (2014, p.149), defining the initial theoretical propositions is the first step to give initial minds to be test and verify with collected interview data.

The qualitative analysis is based on the statistics results. With the help of statistics, some insignificant relations between variables in the research model are removed. According to the improved research model shown in Figure 9 (p.45), the definition of 16 propositions can be made. Each proposition is based on a line in Figure 9 (p.45).

P1 $^{27}$ (IC→PU): Collectivism has a positive influence on perceived usefulness; individualism has a negative influence on perceived usefulness.

P2 (IC→PEU): Collectivism has a positive influence on perceived ease of use; individualism has a negative influence on perceived ease of use.

P3 (IC→SI): Collectivism has a positive influence on social influence; individualism has a negative influence on social influence.

P4 (IC→FC): Collectivism has a positive influence on facility conditions; individualism has a negative influence on facility conditions.

P5 (IC→BI): Collectivism has a positive influence on the acceptance of an electronic payment system; individualism has a negative influence on the acceptance of an electronic payment system.

P6 (MF→PU): Masculinity has a positive influence on perceived usefulness; femininity has a negative influence on perceived usefulness.

P7 (MF→BI): Masculinity has a positive influence on the acceptance of an electronic payment system; femininity has a negative influence on the acceptance of an electronic payment system.

P8 (LO→PEU): Long-term orientation has a positive influence on perceived ease of use.

P9 (LO→SI): Long-term orientation has a positive influence on social influence.

P10 (LO→FC): Long-term orientation has a positive influence on facility conditions.

P11 (PU→BI): Perceived usefulness has a positive influence on the acceptance of an electronic payment system.

P12 (PEU→BI): Perceived ease of use has a positive influence on the acceptance of an electronic payment system.

P13 (PEU→PU): Perceived ease of use has a positive influence on perceived usefulness.

P14 (SI→BI): Social influence has a positive influence on the acceptance of an electronic payment system.

P15 (FC→BI): Facility conditions have a positive influence on the acceptance of an electronic payment system.

$^{27}$ P1 is the first initial proposition.
P16 (FC→PEU): Facility conditions have a positive influence on perceived ease of use.

Categorizing initial propositions is better to conduct comparison between initial propositions and interview data in the same demonstration. According to the initial propositions, for each technology acceptance variables, the related propositions are:

- **Perceived usefulness:** P1(IC→PU); P6(MF→PU); P13(PEU→PU).
- **Perceived ease of use:** P2(IC→PEU); P8(LO→PEU); P16(FC→PEU).
- **Social influence:** P3(IC→SI); P9(LO→SI).
- **Facility conditions:** P4(IC→FC); P10(LO→FC).
- **Behavioural intention:** P5(IC→BI); P7(MF→BI); P11(PU→BI); P12(PEU→BI); P14(SI→BI); P15(FC→BI).

5.2.3 Categories of interview data

To compare the interview data with the initial theoretical propositions in the same dimension, categorizing interview data is necessary. Based on the initial propositions and research purpose, the records of interviews are classified into five groups. They are perceived usefulness, perceived ease of use, social influence, facility conditions, and behavioural intention. The countries and the gender of the participants are presented as below.

Nationality: Iran-IR; Germany-DE; Italy-IT; Spain-ES; China-CN; Japan-JP; Sweden-SE; the U.S.A.-USA; France-FR; Holland-NL.

Gender: M-Male; F-Female.

- **Perceived usefulness**
  
  “I prefer paying with credit cards or bank cards than through a third party. Although the system is secure, I can pay with more simple and direct methods.” (IR M)

  “I have printer myself.” (IT M; NL M)

  “My programme requires … I have no choice if I have to print or copy books in the library.” (CN F).

  “With PayEx, I can print anytime I want.” (SE F; CN M).

  “They have to level up their service.” (USA F).

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28 Collectivism has a positive influence on perceived usefulness; individualism has a negative influence on perceived usefulness.
29 IC is individualism/collectivism; MF is masculinity/femininity; UA is uncertainty avoidance; LO is long-term/short-term orientation; PU is perceived usefulness; PEU is perceived ease of use; SI is social influence; FC is facility conditions; BI is behaviour intension.
“I prefer paying… I can pay with more simple and direct methods.” (IR M)  
“It is too difficult… to register and save (deposit) money.” (IR F)

- **Perceived ease of use**
  “My friend has an account. If I need to, I can use his account and pay him money.” (IT F)  
  “It is too difficult to understand how it works or how to register and save money.” (IR F)  
  “I sent my certification to the service department of PayEx for verification, but got no reply.” (USA F)

- **Social influence**
  “This university required us to use the system.” (DE F; JP F; CN M; SE F)  
  “I prefer … more simple and direct methods.” (IR M)  
  “My friend told me to use it when I came here. He helped me to register an account.” (CN M; JP M)  
  “I will not stay for such a long time… no need to have an account.” (NL F; FR F)

- **Facility conditions**
  “This university required us to use the system.” (CN M; SE F)  
  “With PayEx, I can print anytime I want.” (SE F; CN M)  
  “I sent my certification to the service department of PayEx for verification, but got no reply.” (USA F)

- **Behavioral intention**
  “This university required us to use the system.” (DE F; JP F; CN M; SE F)  
  “I prefer… more simple and direct methods.” (IR M)  
  “With PayEx, I can print anytime I want.” (SE F; CN M).  
  “They have to level up their service.” (USA F).  
  “With PayEx, I can print anytime I want.” (SE F; CN M).  
  “My programme requires us to write some reports. We need to buy some literature. But the literature is so expensive. Printing them is a good choice. ” (CN F).  
  “International credit cards may not be accepted by the system, such as my Chinese bank credit card.” (CN)  
  “My department offers free printing and copying; I do not need to have a PayEx account.” (ES M and F; FR F; SE M)  
  “This university required us ...” (DE F; JP F; CN M; SE F)

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30 Nationality: Iran-IR; Germany-DE; Italy-IT; Spain-ES; China-CN; Japan-JP; Sweden-SE; the U.S.A.-USA; France-FR; Holland-NL.  
Gender: M-Male; F-Female.
“My friends told me ...” (CN M; JP M)

“It is too difficult to understand ...” (IR F)

“A clearer and simpler operation.” (IR F; CN F; IT F) “He helped me to register an account.” (CN M; JP M)

5.2.4 Comparison between findings and initial propositions

With the help of cauterizing of both initial propositions and interview data, for each aspect, the comparison can be conducted. If the collected data can be explained by initial propositions, or the interview data can support initial propositions, the propositions could be proofed. Then this study compares the interview data with initial propositions. With the help of an improved research model, an analysis of the interview data was conducted.

5.2.4.1 Perceived usefulness: P1; P6; P13.

“I prefer paying with credit cards or bank cards than through a third party. Although the system is secure, I can pay with more simple and direct methods.” (IR M) “I have a printer myself.” (IT M; NL M)

“My programme requires ... I have no choice if I have to print or copy books in the library.” (CN F).

For P1 (IC→PU: Collectivism has a positive influence on perceived usefulness; individualism has a negative influence on perceived usefulness): Based on the differences between individualism and collectivism, the three men in the first paragraph tend towards individualism because they make decisions based on their own thinking and feelings. At the same time, the Chinese woman tends towards collectivism by following the organization’s choice. Secondly, all of these users care about the usefulness of PayEx, such as the Iranian man, who thinks credit cards or bankcards or third parties can be used to pay the fee, and that they are all secure methods of payment. But he prefers to pay using his methods. Although there are printers provided by the university, they choose to print using their own printer. In contrast, the Chinese woman stated she had no choice when it came to printing. But she thought she should use the PayEx printer in the library. In addition, the results show the first three men did not use PayEx, but the woman used it. Thus, the above indicates that P1 can be used to explain the situation.

“With PayEx, I can print anytime I want.” (SE F; CN M).

“They have to level up their service.” (USA F).

For P6 (MF→PU: Masculinity has a positive influence on perceived usefulness; femininity has a negative influence on perceived usefulness): These two paragraphs refer to the influence of masculinity and femininity on perceived usefulness. The significant difference between masculinity and femininity is the key words in their minds. For masculinity, the key word is “result”, as indicated by the individuals in the first

31 Nationality: Iran-IR; Germany-DE; Italy-IT; Spain-ES; China-CN; Japan-JP; Sweden-SE; the U.S.A.-USA; France-FR; Holland-NL.

Gender: M-Male; F-Female.
paragraph. They focus on the consequences of using PayEx – “print anytime”. For them, PayEx is for using printers on campus. The woman from the U.S.A. cares more about the experience during the process. She tends towards femininity. In the improved research model, masculinity can have a positive influence on perceived usefulness. The results underline this position for P6.

“I prefer paying... I can pay with more simple and direct methods.” (IR M)  
“It is too difficult... to register and save (deposit) money.”(IR F)

For P13 (PEU→PU: Perceived ease of use has a positive influence on perceived usefulness): The electronic payment system in this case is a third-party system. The usage of PayEx may be not easy for everybody. For some, if the tools are too difficult to learn or use, they can choose another one to achieve their goals. P13 is proven in this section.

5.2.4.2 Perceived ease of use: P2; P8; P16.

“I prefer... more simple and direct methods.” (IR M)  

For P2 (IC→PEU: Collectivism has a positive influence on perceived ease of use; individualism has a negative influence on perceived ease of use): As mentioned before, this response tends to individualism. He said “more simple and direct methods”, which can be seen as a low level of perceived ease of use of PayEx. There are different choices for individuals. If an individual tends to individualism, he will accept less help from groups, friend or others, which means the difficulty of learning and using technology is greater than collectivism. Therefore, individualism has a negative influence on perceived ease of use in this case. But in the record, there is no example of collectivism impacting on perceived ease of use.

“My friend has an account. If I need to, I can use his account and pay him money.” (IT F)

For P8 (LO→PEU: Long-term orientation has a positive influence on perceived ease of use): In the paragraph, the key words are “if I need to”. Based on this, the woman tends towards a long-term orientation because she has a plan for facing possible situations. Although she does not have a PayEx account, she accepts the need to use it. She chooses an easier way without going through a complex registering process, which is mentioned by others. Thus, long-term orientation can affect perceived ease of use positively.

“It is too difficult to understand how it works or how to register and save (deposit) money.”(IR F) “I sent my certification to the service department of PayEx for verification, but got no reply.” (USA F)

For P16 (FC→PEU: Facility conditions have a positive influence on perceived ease of use): As mentioned before, instructions, professional help and other external supports can engage users in choosing technologies. Although PayEx-related information and

32 Nationality: Iran-IR; Germany-DE; Italy-IT; Spain-ES; China-CN; Japan-JP; Sweden-SE; the U.S.A.-USA; France-FR; Holland-NL.
Gender: M-Male; F-Female.
instruction can be found on the website, when users feel the information is difficult to understand, the perceived ease of use is still low. In this case, “difficult to understand” and “no reply” may impact on users’ feelings that external help will support them. They may give up on this choice of using technology.

5.2.4.3 Social influence: P3; P9.

“This university required us to use the system.” (DE F; JP F; CN M; SE F33)

“I prefer… more simple and direct methods.” (IR M)

For P3 (IC→SI: Collectivism has a positive influence on social influence; individualism has a negative influence on social influence): In this case, PayEx, as the unique electronic payment system in Linnaeus University, is used to pay the printing costs of public printers. But students have other options for paying for printing. These students who mention the university’s choices tend towards collectivism. These students use PayEx for paying for printing. The university’s choice can be seen as a kind of social influence. But individuals prefer making decisions based on their thinking and less on others’ influence than collectivists. Thus, P3 is proven. Collectivism has a positive influence on social influence.

“My friend told me to use it when I came here. He helped me to register an account.” (CN M; JP M) “I will not stay such a long time… no need to have an account.” (NL F; FR F)

For P9 (LO→SI: Long-term orientation has a positive influence on social influence): For the Chinese man and the Japanese man, the influence of friends cannot be ignored. The words “when I came here” refer to their friends helping them at the beginning. The result shows that they still use PayEx for printing purposes. However, there is no direct evidence for proving they tend to long-term orientation, or that there is a relation between long-term orientation and social influence. But the second sentence indicates the Dutch woman and the French woman have a short-term orientation because they do not have plans for the future, and just think they do not need the system. As exchange students, they will not stay for a long time. In their words, there make no reference to others’ suggestions or views. That means individuals in a short-term orientation care less about social influence.

5.2.4.4 Facility conditions: P4; P10.

“This university required us to use the system.” (CN M; SE F) “With PayEx, I can print anytime I want.” (SE F; CN M)

For P4 (IC→FC: Collectivism has a positive influence on facility conditions; individualism has a negative influence on facility conditions): In the first paragraph, both the Chinese man and the Swedish woman can be seen as collectivists because they mention the university’s choice for using PayEx. “With PayEx I can…” means they

33 Nationality: Iran-IR; Germany-DE; Italy-IT; Spain-ES; China-CN; Japan-JP; Sweden-SE; the U.S.A.-USA; France-FR; Holland-NL.
Gender: M-Male; F-Female.
believe external influences (such as Linnaeus University) will support them in using this electronic payment system through providing printers, instruction and so on. That proves collectivism can impact on facility conditions positively.

“I sent my certification to the service department of PayEx for verification, but got no reply.” (USA F)

For P10 (LO→FC: Long-term orientation has a positive influence on facility conditions): This woman should be classified as having a short-term orientation because when she got “no reply”, she gave up, without asking for more help. She may not have enough patience to use this technology. Short-term orientation may have a negative influence on facility conditions.

5.2.4.5 Behavioural intention: P5; P7; P11; P12; P14; P15.

“This university required us to use the system.” (DE F; JP F; CN M; SE F)

For P5 (IC→BI: Collectivism has a positive influence on the acceptance of an electronic payment system; individualism has a negative influence on the acceptance of an electronic payment system): The women from Germany, Sweden and Japan, and the Chinese man thought the organization’s requirements should be followed, and that members should believe in the choice of the group. They are collectivists. The situation indicates the collectivism may impact on members’ choice of using new technologies positively.

“With PayEx I can print anytime I want.”(SE F; CN M).

“They have to level up their service.” (USA F).

For P7 (MF→BI: Masculinity has a positive influence on the acceptance of an electronic payment system; femininity has a negative influence on the acceptance of an electronic payment system): As mentioned above, the Swedish woman and the Chinese man display masculinity, and the American woman displays femininity. Based on the results, the study finds masculinity can engage potential users in using electronic payment systems. But during the process, any bad experience may influence individuals displaying femininity to give up on this technology.

“With PayEx I can print anytime I want.”(SE F; CN M). “My programme requires us to write some reports. We need to buy some literature. But literature is so expensive. Printing them is a good choice.” (CN F).

“International credit cards may not be accepted by the system, such as my Chinese bank credit card.” (CN) “My department offers free printing and copying. I do not need to have a PayEx account.” (ES M and F; FR F; SE M)

For P11 (PU→BI: Perceived usefulness has a positive influence on the acceptance of an electronic payment system): Based on the words of the Chinese man and the Swedish woman, usefulness is a key word in their minds. Although the five men do not print,

34 Nationality: Iran-IR; Germany-DE; Italy-IT; Spain-ES; China-CN; Japan-JP; Sweden-SE; the U.S.A.-USA; France-FR; Holland-NL.
Gender: M-Male; F-Female.
usefulness is still what they care about. The above means people accept technology mostly based on the prediction of its usefulness. Thus, P11 is proved to be correct.

“It is too difficult to understand...” (IR F)

“A clearer and simpler operation.” (IR F; CN F; IT F) “He helped me to register an account.” (CN M; JP M)

For P12 (PEU→BI: Perceived ease of use has a positive influence on the acceptance of an electronic payment system) and P15 (FC→BI: Facility conditions have a positive influence on the acceptance of an electronic payment system): Instructions and other kinds of external supports can increase users’ beliefs in using technology. With the help of friends, the learning and using of PayEx can be easier. Facility conditions may affect perceived ease of use positively, and perceived ease of use has a positive influence on user acceptance. Facility conditions have a positive workforce on users’ acceptance.

“This university required us...” (DE F; JP F; CN M; SE F) “My friends told me...” (CN M; JP M)

For P14 (SI→BI: Social influence has a positive influence on the acceptance of an electronic payment system): In this case, both the university’s requirement and friends’ words are a social influence. With these suggestions and requirements, they choose to use the electronic payment system. That indicates social influence impacts on user acceptance positively.

5.2.5 Revision of propositions

According to the comparison results, most of the initial propositions from the improved research model are validated. For P2 36 and P9 37, there are no evidences to prove collectivism have positive impaction on perceived ease of use, or long-term orientation have positive workforce on social influence respectively.

The students more tend towards collectivism, the greater the probability they will accept PayEx. The influences exist in four aspects of user acceptance: perceived usefulness, social influence, facility conditions and behaviour intentions. Individualism has a negative influence on perceived ease of use.

Masculinity intention has a positive influence on perceived usefulness and students’ behaviour intention to accept PayEx.

Short-term orientation has a negative workforce on social influence. Long-term orientation has a positive influence on students’ perceived ease of use and facility conditions.

35 Nationality: Iran-IR; Germany-DE; Italy-IT; Spain-ES; China-CN; Japan-JP; Sweden-SE; the U.S.A.-USA; France-FR; Holland-NL.
Gender: M-Male; F-Female.
36 P2 (IC→PEU): Collectivism has a positive influence on perceived ease of use; individualism has a negative influence on perceived ease of use.
37 P9 (LO→SI): Long-term orientation has a positive influence on social influence.
With regard to other initial propositions, P11–P16\(^{38}\) is proven as correct, as illustrated in previous studies.

Based on text analysis, the improved model can be revised as below. The revised research model is the final one, what the study achieved.

![Revised research model](image)

Comparing with Figure 1 (p. 8) and Figure 9 (p. 45), two lines have been removed, which refers to the relation between individualism/collectivism and perceived ease of use, and the relation between long-term/short-term orientation and social influence.

5.2.6 Supplementary evidence

In this case, there are some details of collected data can be discussed as supplementary issues.

“A clearer and simpler operation.” (IR F; CN F; IT F\(^{39}\))

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\(^{38}\) P11 (PU→BI): Perceived usefulness has a positive influence on the acceptance of an electronic payment system.

P12 (PEU→BI): Perceived ease of use has a positive influence on the acceptance of an electronic payment system.

P13 (PEU→PU): Perceived ease of use has a positive influence on perceived usefulness.

P14 (SI→BI): Social influence has a positive influence on the acceptance of an electronic payment system.

P15 (FC→BI): Facility conditions have a positive influence on the acceptance of an electronic payment system.

P16 (FC→PEU): Facility conditions have a positive influence on perceived ease of use.

\(^{39}\) Nationality: Iran-IR; Germany-DE; Italy-IT; Spain-ES; China-CN; Japan-JP; Sweden-SE; the U.S.A.-USA; France-FR; Holland-NL.

Gender: M-Male; F-Female.
As the women from Iran, China and Italy said, a clear operation should be introduced effectively. According to the definition of uncertainty avoidance, this kind of requirement reflects the demands for avoidance uncertainty. Based on this, the study supposes that there could be some influence from uncertainty avoidance to predicting usefulness and ease to use.

In this study, the 15th question in the guideline shown provided the basic feelings of interviewees on cultural influence. Their answers show some interesting issues.

The man from Iran is a master’s student in computer science. All of his points are significant for the study. He mentioned the change in the printing mechanism and the narrow usage of PayEx. Furthermore, a third party in the payment transaction is involved. His words represent how organization norms change may affect students’ choice of using technology.

Some users thought culture was a basic worldview group. “The virtue and status of cultural will impact behaviours, such as helping others”. The attitude to the same thing may be different to the impact of personal experiences and dispositions. Their thoughts indicate the situation that personal acceptance attitudes to electronic payment system could be different and care should be taken in trying to predict them.
6 Discussion

In this chapter, consideration of key points is presented. This includes a discussion of the results and their limitations, the research’s contribution, directions for further research and reflections.

6.1 Discussion of results

According to the research purpose of understanding the influence of culture working on individuals’ acceptance of electronic payment systems, the study questions are whether culture can affect individuals’ decision-making in accepting electronic payment systems or not, and how culture affects individuals’ decisions to accept electronic payment systems. Although the results may not be perfect, these two research questions have been answered through establishing a research model and hypotheses, and conducting structural equation modelling and text analysis. The final results show culture has an influence on user acceptance of electronic payment systems at the individual level. How culture works on individuals in choosing whether to accept an electronic payment system is proven as well.

In summary, collectivism has positive influences on four aspects of user acceptance. They are perceived usefulness, social influence, facility conditions and behaviour intentions. At the same time, individualism has a negative influence on perceived ease of use. Masculinity has a positive influence on perceived usefulness and users’ behaviour intention. Long-term orientation has a positive influence on users’ perceived ease of use and facility conditions. Short-term orientation has a negative workforce on social influence. Perceived usefulness, perceived ease of use, social influence, and facility conditions have positive influences on users’ behaviour intention. In addition, perceived ease of use has a positive influence on perceived usefulness, and facility conditions have a positive effect on social influence. Based on these results, culture influences individuals’ acceptance of electronic payment system.

For the results of individualism/collectivism: In contrast to the findings of Strite and Karahanna (2006), this study finds there is a significant influence from individualism/collectivism on user behaviour intention. Collectivism has a positive influence on perceived usefulness, social influence and facility conditions. Individualism has a negative influence on perceived ease of use.

A possible explanation for this is that individualism and collectivism affect behavioural tendencies and personal values. Individuals make decisions more based on their own feeling of value. That means individualisms may receive less influence or powerful force to accept the electronic payment system than collectivisms. There is another powerful explanation for this result. Individualism and collectivism influence user acceptance, perceived usefulness, perceived ease of use, social influence and facility conditions, and these four aspects of user acceptance have a positive effect on behaviour intention. There must be some impact from individualism and collectivism (Strite and Karahanna, 2006).
Regarding the results of masculinity/femininity, masculinity has a positive influence on perceived usefulness and users’ behaviour intention.

The possible explanation for there being no significant finding in other items of user acceptance is that the weight of relations between masculinity and femininity to perceived ease of use, social influence and facility conditions is less than other relations in the model.

Regarding the results of uncertainty avoidance, it has no significant effect on user acceptance of an electronic payment system.

The main explanation for the result should be that the influence of uncertainty avoidance on user acceptance is less than for other items because the path is deleted in the modified process of the statistical analysis. Based on the interview data and literature review, this study assumes that influence exists to some extent in the text analysis stage, which can be tested in further work by other researchers. An additional reason could be the scales and the questionnaire may not be aligned closely enough with the theoretical hypothesis.

Regarding the results of long-term/short-term orientation, it has a positive influence on users’ perceived ease of use and facility conditions. Short-term orientation has a negative effect on social influence.

A possible explanation for unproved relations is the lack of enough evidence for long-term orientation. In the statistical analysis process, the scales may reflect the feeling of the respondents.

Regarding the results of user acceptance, perceived usefulness, perceived ease of use, social influence and facility conditions have positive influences on users’ behaviour intention. In addition, perceived ease of use has a positive effect on perceived usefulness, and facility conditions have a positive effect on social influence.

These relations pertain to the user acceptance. This technology acceptance variables is more mature than the research model studied in this research. The results are similar to other prior studies, which demonstrates the research methodology can be accepted as being correct.

6.2 Limitations

In this study, there are some limitations should be discussed at this section.

6.2.1 Sample size

In this study, the most observed limitation was the lower sample size in the statistical analysis. That is the main disadvantage of non-probability sampling methods. With non-probability sampling methods, the number of the research population and the sample size cannot be known before collection (Stat Trek, 2015). It cannot ensure the samples will achieve the goal (Stat Trek, 2015).

Generally, in statistics, the number of samples should be not less than the number of questions (Stat Trek, 2015). Therefore, the 47 responses are enough to conduct quantitative research.
To conduct structural equation modelling, the requirements of the sample size are different. As Bentler (1989) has suggested, within the MIS field, a 5:1 ratio of a sample size to the number of questions may achieve better results (Westland, 2010). With the help of item analysis and factor analysis in this study, the questions are reduced to 28. Therefore, there are 28 questions in the questionnaire and at least 140 samples required. In considering a lower sample size, according to Westland (2010), the minimum sample size should be not less than 100. In these views, the reliability of my work is not good enough in structure equation modelling.

Furthermore, the GFI of the research model is 0.57. These points indicate the results of statistics are not good for applying results directly in practice. In other words, the statistics results cannot be applied for predicting the adoption of electronic payment systems directly, and companies should compile their quantitative statistics for specific technologies with larger sample sizes than used in this study. Choosing suitable sampling methods in practice is required as well.

However the quantity of the samples was not big enough. If the quality was good, the results could be useful (Zaslavsky, 2001). In this questionnaire, there were two questions about personal norms. All of the responses show that these students grew up in their home countries, which means all of them have had a cultural influence before they studied in Linnaeus University.

In this case, the qualitative case study provided a valuable analysis for statistics results. Through the interviewing of students, some statistical results were proven. Moreover, these proven results could be applied in further research.

6.2.2 Sampling control

Going through the data collection and statistical analysis, there is a limitation with the sampling control. With the help of the questionnaire, the collection of data was easier than using a traditional approach. But the possibility of true and accurate responses was not taken into account, which may lead to different outcomes. Although the limitation of access was strict in the research, I suggest further work be conducted on data collection through emailing or using more direct methods to reach the samples.

Furthermore, qualitative research was conducted to provide an in-depth analysis as a supplement to the research. Interviewing is the main method for collecting data in the qualitative research section. Although the data collected through the interviews has the advantages of being rich and detailed, providing insights, and allowing for explanation and the clarifying of questions, interviewing is a time-consuming method and very flexible with the results it produces (Yin, 2014). According Oyserman, et al. (2002), the way researchers ask questions may affect the response. Thus, this study is limited by the researcher’s experiences.

In quantitative data collection, an online survey was conducted, where each IP address could only submit one response. If the person answered the questionnaire through both a computer and a telephone, or if a person asked their roommate to do the investigation based on the roommate’s mind, the outcomes may have created overlap or less accuracy. Another issue is viewers’ sharing behaviour. In this study, social networking was chosen.
to encourage participation. That means the data reliability may be affected through users’ sharing invitation links to others, who was not within the sample parameters. Addressing these situations, the researcher checked the responses to ensure they are different. Sampling control is required to be stricter in future work.

6.2.3 Limitation of results

This study is to link culture and informatics. According to Leidner and Kayworth (2006), there are two main challenges in the research relating culture to information systems. The first one is defining culture (Leidner and Kayworth, 2006). Another challenge is the measuring of culture (Leidner and Kayworth, 2006). In related studies, culture has been defined at different levels, such as at the firm’s level, the country level and the group level (Leidner and Kayworth, 2006). In this study, culture is defined as members’ thinking in a group. This research was focused on studying how culture shapes users’ acceptance behaviour. To measure cultural shaping, the scales suggested by Dorfman and Howell (1988) were applied. But the expressions made through oral presentation and writing in the questionnaires and interviews may affect the collected data, which is limited by the researcher’s skills and experiences.

In addition, information technologies are always improving, and cultures change over time. All of the results achieved by this thesis address the case of PayEx being used in Linnaeus University. There are several different kinds of electronic payment systems in use globally. The results need to be examined in comparison with other kinds of payment systems and in wider places for generalizing.

6.3 Contributions to theory and practice

Theoretically speaking, this research answers the question of whether culture can affect user acceptance at the individual level. The results provide an understanding in a cross-cultural research focus on electronic payment systems. Moreover, they explain the relations between cultures and users’ behaviour. The research approach can be seen as a theoretical choice for cross-cultural research at the individual level. In addition, it provides an overview of the literature background in the culture, user acceptance and electronic payment systems fields. Furthermore, this study empirical examines the relations between technology acceptance variables, such as in UTAUT and TAM.

In practice, this study gives electronic payment systems developers more scope in developing technologies. If the sample sizes could be increased, for some organizations, especially international groups, the results could be applied to employees to change or manage resources for achieving better technology adoption. Moreover, the results can give thought for predicting users’ behaviours with more consideration of human attributes.

6.4 Further research

Based on the limitations of this research, expanding the samples size and improving the quality of the scales could be a direction that would yield much more reliable outcomes. Moving the study approaches into other fields of research is a possible direction. Furthermore, the text analysis method chosen in this study should be an iterative process.
(Yin, 2014). That means further work could establish propositions based on this study’s results, and other interviews could be conducted in order to revise the propositions.

In relation to the research, there are fruitful directions for future work, such as explaining cultural influences at a national level. During the statistics process, an interesting situation occurred. In the path diagram of the cultural influence scale, a significant effect between individualism/collectivism and uncertainty avoidance (weight, 0.77) emerged. Although the relations between cultural items are not key points in this study, it could be taken as a direction for further work.

6.5 Reflections

The literatures and theories used in this study need to be enriched. Some of literatures are old or narrow, such as Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) and the Theory of Planned Behaviour (TPB) (Ajzen, 1991). The development of knowledge is often chaotic, unstructured and unsystematic (Bhatt, 2000). Therefore the principles of manufacturing strategies should be refined and initiated based on the different development phase of knowledge (Bhatt, 2000). Updating and expending the knowledge could help to re-evaluate every phases of knowledge development cycle and for better knowledge application (Bhatt, 2000).

Further, the technology is developing rapidly. The PayEx may have several versions with small difference rather than its earlier versions. In another perspective, different application or different software in the market may have similar functions. Did they all need to study each software’s acceptance or for each version? Of course not. Furthermore, the user acceptance is at individual level. The degree of the influence from national culture or group culture on individuals are different. To enterprise, they have no time to study each potential consumer’s acceptance towards the specific one software or even each version.

Then, two questions appear. How to group the potential consumers and how to conduct user acceptance study?

In this study, it achieves result. But a person is complex, who will not only have one of the four cultural influences. It is difficult to group persons into these factors. Moreover, most of enterprises have no much time and money for study the adoption of technology. A generalized model with large sample size is much valuable in practice. The generalized model can be used widely and help for saving research cost for the enterprises. But the sample size in the study lead the result not reliable enough to be generalized and the result cannot be applied in practice directly.

In addition, the purpose of this study is to contribute to understand how cultural influence works on the acceptance of electronic payment systems. The variety of electronic payment systems and personal attributions may affect the research results, which did not be considered before conducting data collection. Therefore, the contribution is limited. In fact, there are some better sampling methods than the one used in the study, such as random sampling and systematic sample on the page, Sampling-methods (Stat Trek, 2015), which can ensure the sample size and control the sample quality.
Finally, this study links culture to information system. It discusses culture with four dimensions at the individual level. If fact, the so called “cultural influence” in this study is a potential thing exist in individuals’ mind. Thus, it can be seen as a personal norm, which means it could be independent variables same with perceived usefulness, perceived ease of use, SI is social influence and facility conditions, and behavioural intention could be the only dependent variables. Then, the research model could be simplified.
7 Conclusions

The purpose of this study was to understand the influence of culture on the users’ behaviour in accepting electronic payment through conducting both quantitative and qualitative research. Both of two research questions are answered.

Towards the first research question, this study proves the cultural influence impact users’ behavioural intentions through studying the case of PayEx in Linnaeus University. Based on the research, the second research question is answered as well. The results of this research indicate culture can affect users’ acceptance towards PayEx in five aspects, perceived usefulness, and perceived ease of use, behavioural intention, social influence and facility conditions. The most of influences are from individualism/collectivism, masculinity/femininity, and long-term/short-term orientation.

For the collecting of data, the methods of the questionnaire and the interview were chosen, with a total of 47 responses received and 20 interviewees who participated in this study. Structural equation modelling and text analysis were the two main methods for analysing the data.

With the help of SPSS 19.0 and LISREL 8.70, structural equation modelling proved only 16 hypotheses, which is much less than the total of 26 hypotheses proposed. The paths of uncertainty avoidance are not all supported, and neither are some of masculinity/femininity and long-term/short-term orientation paths. All the relations, from collectivism to perceived usefulness, perceived ease of use, social influence, facility conditions and behaviour intention, from masculinity to perceived usefulness and behaviour intention, and from long-term orientation to perceived ease of use, social influence and facility conditions and other relations in the user acceptance model are proven as positive relations.

However, in the text analysis, only 14 propositions were proven. Without enough empirical data, the influence of collectivism on perceived ease of use and long-term orientation on social influence cannot be discussed. Finally, collectivism has a positive influence on four aspects of user acceptance. These are perceived usefulness, social influence, facility conditions and behaviour intentions, and individualism has a negative influence on perceived ease of use. Additionally, masculinity has positive influences on perceived usefulness and users’ behaviour intention. Long-term orientation has positive influences on users’ perceived ease of use and facility conditions. Short-term orientation has a negative effect on social influence. In addition, perceived usefulness, perceived ease of use, social influence and facility conditions have positive influences on users’ behaviour intention. Perceived ease of use has a positive effect on perceived usefulness, and facility conditions have a positive effect on social influence.

Generally, this study provides an understanding on the effect of cultural influences on user acceptance and electronic payment system acceptance, and it gives some direction for future research. One additional benefit of this research is the study approach, which can be applied to further cross-cultural research at the individual level.
References


Appendices
Appendix A: Questionnaire

The questionnaire was developed in English and sent to Växjö campus students at LNU. There are three sections of questions in this survey. What follows is the content of questionnaire.

Statement

Hi all,

I need some volunteers to take part in my final project. If you are studying at LNU in Växjö, and you using PayEx, you are who I am looking for. And what you need to do is fill in this anonymous questionnaire. It will take no more than 10 minutes to answer. Most of these 36 items need to be given a score of between 1 and 5 (1 is the lowest). Tips: the answer you can submit only once, because of there is a limitation of IP address.

It is the link: http://www.wenjuan.com/s/MJni6f

I am a master student in Informatics, and the research is about acceptance of PayEx based on cultural influence.

Thanks for your attention and contribution to this study.

Best Regards.

Malanxin Wei

The link of questionnaire
http://www.wenjuan.com/s/MJni6f

Content of questionnaire

Linnaeus University students’ acceptance of PayEx in Växjö

Dear students,

I am a master student in informatics at LNU and am doing my final project about acceptance of PayEx based on cultural influence. I would like to get some volunteers who are studying in Växjö to take part in my study. What you need to do is fill in this anonymous questionnaire.

This questionnaire will take no more than 10 minutes to answer. Most of these 36 items need to be given a score of between 1 and 5 scores (1 is the lowest).

Thanks for your attention and contribution to this study.

Best Regards,

Malanxin Wei
### 1. Background

<table>
<thead>
<tr>
<th></th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nationality</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Nation you grew up in and received education</td>
<td></td>
</tr>
<tr>
<td>Education level</td>
<td></td>
</tr>
<tr>
<td>Department</td>
<td></td>
</tr>
</tbody>
</table>

### 2. Cultural influences (Please give a 1–5 score, 1 is the lowest)

<table>
<thead>
<tr>
<th></th>
<th>Extent of agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>I use PayEx, because the university accepts it.</td>
<td></td>
</tr>
<tr>
<td>I want more options apart from PayEx that can be chosen freely.</td>
<td></td>
</tr>
<tr>
<td>If others use PayEx, I should do the same thing.</td>
<td></td>
</tr>
<tr>
<td>The man always pays more attention to results rather than relations and process.</td>
<td></td>
</tr>
<tr>
<td>The man usually learns new technology more quickly.</td>
<td></td>
</tr>
<tr>
<td>The woman usually tries to solve problems more sensitively.</td>
<td></td>
</tr>
<tr>
<td>Normal regulations are helpful in guiding my behaviour.</td>
<td></td>
</tr>
<tr>
<td>Clear and detailed instruction is important to me.</td>
<td></td>
</tr>
<tr>
<td>I always need clear lists and the requirements to know what I should do.</td>
<td></td>
</tr>
<tr>
<td>I never give up learning new things.</td>
<td></td>
</tr>
<tr>
<td>I can spend a long time in achieving my goals.</td>
<td></td>
</tr>
<tr>
<td>I can compromise to reach my aim.</td>
<td></td>
</tr>
</tbody>
</table>

### 3. Acceptance of PayEx (Please give a 1–5 score, 1 is the lowest)

<table>
<thead>
<tr>
<th></th>
<th>Extent of agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>I find PayEx useful for paying.</td>
<td></td>
</tr>
<tr>
<td>Using PayEx enables me to pay more conveniently.</td>
<td></td>
</tr>
<tr>
<td>Using PayEx increases my efficiency.</td>
<td></td>
</tr>
<tr>
<td>Using PayEx enables me to pay safely and accurately without mistakes being made.</td>
<td></td>
</tr>
<tr>
<td>I find PayEx easy to use.</td>
<td></td>
</tr>
<tr>
<td>Learning how to use PayEx is easy for me.</td>
<td></td>
</tr>
<tr>
<td>My interaction with PayEx is clear and understandable.</td>
<td></td>
</tr>
<tr>
<td>It is easy for me to become skilful with using PayEx.</td>
<td></td>
</tr>
<tr>
<td>People who may influence my behaviour, such as my friends, classmates and teachers, suggest I should use</td>
<td></td>
</tr>
<tr>
<td>PayEx.</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td>I use PayEx on my own.</td>
<td></td>
</tr>
<tr>
<td>Professors, librarians and other department workers recommend me to use PayEx.</td>
<td></td>
</tr>
<tr>
<td>The university requires PayEx to be used. So I have to use it</td>
<td></td>
</tr>
<tr>
<td>I have the necessary devices to use PayEx.</td>
<td></td>
</tr>
<tr>
<td>I know how to use PayEx.</td>
<td></td>
</tr>
<tr>
<td>There is a guidance about using PayEx on a website, and it can be found easily</td>
<td></td>
</tr>
<tr>
<td>I can contact a specific person or an organization for help if I have difficulties in using PayEx.</td>
<td></td>
</tr>
<tr>
<td>I will use PayEx in future.</td>
<td></td>
</tr>
<tr>
<td>I would like to use PayEx frequently.</td>
<td></td>
</tr>
<tr>
<td>I will recommend PayEx to others.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B: Interview Guidelines

The interview guidelines were developed in English for interviewees. Both a personal background and general questions were involved during the execution process. In total, there are 15 questions in the guidelines.

In this section, the aims of the questions are shown before each question.

Background information:
These five questions provide the personal data on interviewees. Starting with them can reduce interviewees’ nerves or pressure, and establish a good communication environment.

1. Nationality: _________
2. Gender: _________
3. Nation of grew up and accepted education: _________
4. Education level: _________
5. Department: _________

General questions:
These ten questions are beneficial for qualitative research.

No. 6 was to build a close relationship with interviewees.

6. How long have you been here? And how long will you stay here?

This question is aimed at recording their final decision regarding PayEx (in the case), and at exploring their source of information or knowledge about PayEx, which can be seen as the influence source.

For example, if an individual receives positive knowledge about PayEx from a close friend and they decide to use it, they may have received a social influence from their friend.

7. Do you use PayEx? How do you know it?

This question records the change intention of users’ behaviour in relation to a specific electronic payment system.

8. How long have you used and what’s your frequency of using PayEx?

The question aims to get the users’ insights into using an electronic payment system.

9. Do you use other online payment systems? Can you give me any examples?

This one presents users’ behaviour intention.

10. Do you intend to use PayEx in the future?

This one aims to discover possible issues or factors impacting on user acceptance.
11. Are you satisfied with PayEx? Why?
This question aims to identify individuals in the uncertainty avoidance variable.

12. What choice do you prefer in facing uncertainty brought by a new technology?
   Do you prefer to try it at once or wait for others’ experience?
This question explores the possible factors impacting decision-making in the case.

13. What made you want to try a new electronic payment system? Why do you use PayEx (or not)?
This question tries to understand individuals’ thoughts on cultural feelings and cultural influence on other individuals.

14. Do you think culture may influence individuals’ decision-making? Why? And how?
This one is encourages interviewees to share their minds with the researcher.

15. Is there anything else you want to talk about?