I. Introduction

The beginning of the thesis starts with an introduction. It will cover the author's motivation and specific interest about the topic The Role of Cultural Dimensions in the Acceptance of Retail Innovations. This provides a logical flow about this topic that leads toward the creation of the framework used for the Master Thesis research. This is followed by section Research objectives. These objectives are to be met during the research process and aim to contribute to the future development of the retail industry. At the end of the introduction section the thesis structure that provides an overview of the research and steps to be taken toward achieving the research objectives is presented.

1.1. Research motivation and background

The author's interest about the topic The Role of Cultural Dimensions in the Acceptance of Retail Innovations has two influences. The first one originates from authors education and work experience in the area of retail business. Author has developed interest into the retailing business. The author was employed in this business area, as well as topics about the retailing were the primary interest of researches during author's university education. This is combined by author's exposure to multicultural environment while living in five counties and two continents. These two influences together formed the specific research interest about differences and similarities of acceptance of retail innovations between cultures characterized by different cultural dimension.

There are many technological innovations in the retailing. And these innovations are developed from year to year. The changes occur as technology is developing and consumers adapt to more efficient and more advanced technological solutions. In the past, calculators or

cashier machines were considered as technological innovations in retailing. Their adaption increased as efficiencies were reached. For example, cashier machines decreased the time necessary for the business process, decreased the number of employees and overall decreased the operation costs one realized. Even just from a fast review of retail technological innovation in the past, it can be concluded that they are mostly adapted and tending toward decreasing the cost one realized. Retailing is a labor intensive business and it is defined by high labor costs. Therefore, the modern retailing proposes business models based on self-service technology. These technologies decrease the cost of employees and add a new customers' loyalty. Customers become more involved in the business process, by self-serving and overtaking the role of service employees through technological innovation.

There are different proposed concepts of modern retailing. Kalyanam, Lal, & Wolfram (2010) have presented the concept of METRO Group "Future Store". The first Metro Future Store was opened on April 28, 2003 in the city Rheinberg in Germany. This kind of store is characterized by high level of technology development, based on self-service technologies (SSTs). This is a concept that provides an overview of a potential future trend of technology retail business model. Metro Future Store includes technological innovations, such as Personal Shopping Assistant (PSA), Intelligent Weighing Scale, Electronic price tags and Digital Advertising Displays. These innovations are still not widely used in the retailing business. By their implementation in specific stores, technological innovations are being tested, as well as consumers' attitude toward their usage. This will allow retailers to customize the technological innovations to fit perfectly consumers' needs and become well accepted. However, there are innovations, which are widely used in the developed world, at the current stage of technology and retail industry development. Self-scan checkouts are an example of self-service technology. By

usage of self-scan checkouts customers scan the barcodes of their products, pay for the products and put them into bags on their own, without the help of service employees (Schliewe & Pezoldt, 2010).

As, shown by previous research, there is positive relationship between self-service technology and decreasing costs of retailing. If these technological innovations have positive effect on the retailing business in one society or culture, it is necessary to test if consumers are willing to adopt these innovations in other societies or cultures. Different cultures have different levels of factors such as self-efficacy, social pressure and technology anxiety. These differences will lead to different levels of self-service technology adoption (Schliewe & Pezoldt, 2010). Retailers recognize the importance of identifying how acceptance of retail innovations varies in different cultures. This allows retailers to shape their technology strategy according to consumers' preferences in the globalized economy.

1.2. Research objectives

The purpose of this research is to study factors that influence acceptance of self-service retail innovations and to propose methods to measure these factors across cultures. In particular, the research studies how cultural dimensions influence the acceptance of technology used to deliver new ways of shopping. The cultural dimensions include uncertainty avoidance and the collectivistic cultural dimensions as moderating factors to predict technology acceptance. Understanding these dimensions is important in the globalized economy where international retail firms are planning to increase market share in different countries. Understanding potential adaptation of new technology based service models is crucial for successful market entry. Besides studying factors that influence acceptance of self-service retail innovations across

cultures, this research studies the acceptance of different types of retail innovation across cultures. Future research will extend the model to test the acceptance across multiple cultures and multiple retail innovation types. Thus, the objectives of this Master thesis are:

1. Explore how different cultural dimensions (e.g. collectivistic/individualistic, high uncertainty avoidance/low uncertainty avoidance) influence acceptance of retail innovations;
2. Explore how attitude toward retail innovation types differ across cultures.

1.3. Thesis structure

The structure of the research is separated into two sections. The first section will test how collectivistic and high uncertainty avoidance cultural dimensions (hypothesized to Taiwan consumers) and individualist and low uncertainty avoidance cultural dimensions (hypothesized to Swedish students) influence acceptance of retail innovations. The influence of these two groups across opposing cultural dimensions will be tested across psychological categories: social pressure, technology anxiety and self-efficacy. Independent sample t-test analysis will be used for testing the differences between two cultures. The second section of this research will use a multi-attribute model for evaluating attitudes toward different retail innovation types (Personal Shopping Assistant, Intelligent Weighting Scale, Electronic Price Tags, Self-Scan Cashiers, Digital Advertising Displays) among collectivistic/high uncertainty avoidance and individualistic/low uncertainty avoidance cultures.

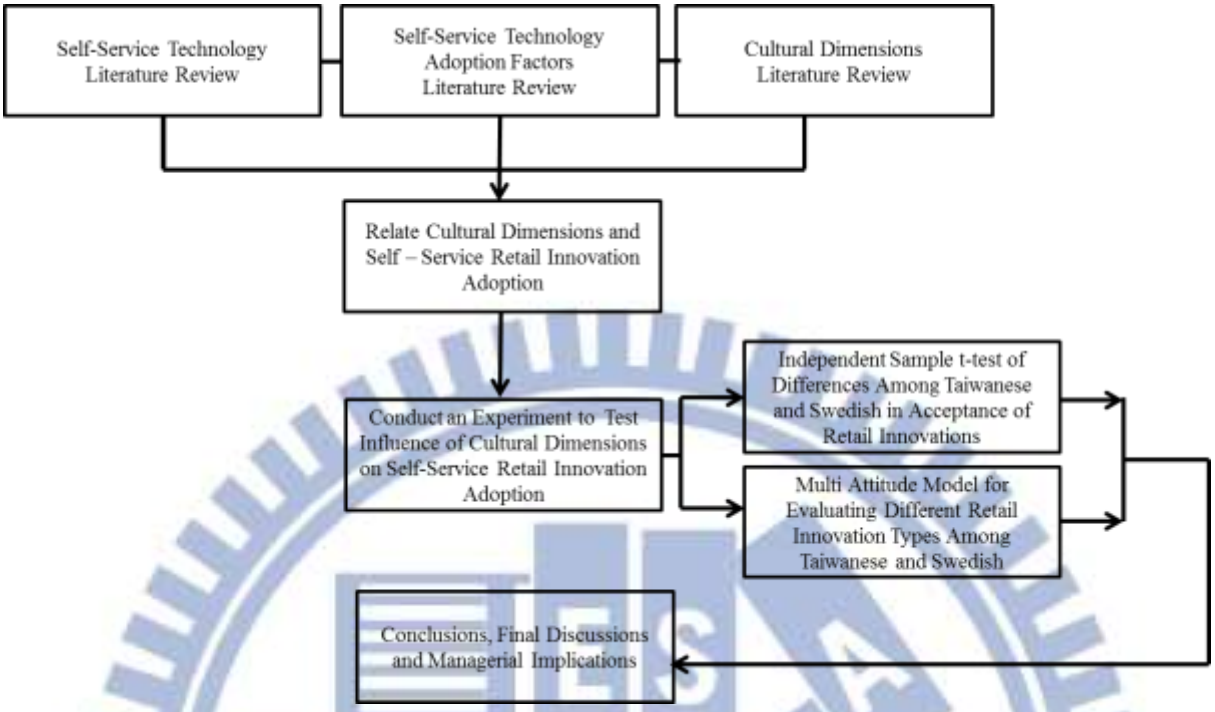


Figure 1. An overview of the research process and structure

II. Literature review

In the following sections, the current published knowledge related to the acceptance of self-service technologies (SST) and cultural dimensions is reviewed. First, SSTs are defined with reference to effective implementation used by global retailers. This is followed by customers' adoption factors of SST to provide a basis for data collection, modeling, and prediction. Cultural dimensions with a focus on Taiwanese and Swedish culture are presented and are linked with SSTs adoption factors. The review provides a basis for defining the influence of cultural dimensions on retail service innovation acceptance across cultures.

2.1. Self-service technology

SSTs are ubiquitous these days. In the modern world, which is characterized with high level of technology development, employees are being replaced by technology. By using of technology, customers are overtaking the role of service employees. Retail self-service technologies are characterized by the use of information and communications technologies to replace the labor of service clerks. The customers themselves are playing the role of service employees with the assistance of new information systems and electronic retail service applications. The business processes are changing from one where the retailer serves all customers to one where the customers serve themselves and become integrated to the retail process. Employees are being replaced by technology and customers are becoming more independent and active in the service process. SSTs are technological interfaces that allow customers to perform service on their own, without direct assistance from service employees (Meuter, Ostrom, Roundtree, & Bitner, 2000).

There are different types of SSTs. Those are used in different industries. A large number of research papers have analyzed the efficacy of SSTs in the banking and the tourist industry. There are different types of SSTs. One type can be used and accessed from consumers' homes via the Internet. Other types are located in the retailers' place of business and are used when customers visit the retailer. These SSTs are classified into different types. For example Meuter et al. (2000), note that SSTs include automated teller machines (ATMs), automated hotel checkout, banking by telephone, and services over the Internet, such as Federal Express packaging tracking and online brokerage services (Meuter et al., 2000).

Retailing is defined as a set of business activities that adds value to the products and services sold to consumers for their personal and family use (Levy, M., & Weitz, B. A., 2012).

Adding value to retailing has changed as technology has changed. More and more retailers are using SSTs. There are different proposed concepts of modern retailing. Kalyanam, Lal, & Wolfram (2010) have presented the concept of The METRO Group Future Store. This kind of store is characterized by a high level of technology development, based on SSTs. Metro's approach provides an overview of a potential future trend of technology retail business model. Metro Future Store includes technological innovations such as Personal Shopping Assistant (PSA), Intelligent Weighing Scale, Electronic price tags and Digital Advertising Displays. PSA is a shopping basket equipped with a portable touch screen computer, UPS scanner, wireless connectivity using Wi-Fi and content accessed through browsers using hypertext transfer protocol (http.) This serves to consumers as their personal assistant, based on technology and is operated by consumers. The function of the PSA is to lead the consumer through the store, promotion, purchasing list and to assist to the consumer during his purchasing process. It also allows consumers to self-scan and pay for purchased products through RFID technology.

Figure 2. Personal shopping assistant (Institute for information industry, Innovative DigiTech-Enabled Applications & Services Institute, IDEAS, 2012)

Intelligent Weighing Scale allows consumers to weigh products, obtain a price and a bar-coded label. A critical characteristic of this weighting scale is that it recognized the product through its camera, so consumers do not need to indicate the product by themselves.

Figure 3. Intelligent weighting scale (Institute for information industry, Innovative DigiTech-Enabled Applications & Services Institute, IDEAS, 2012)

Electronic price tags are used for automatic change of price on shelves, that give an advantage to customers to know the exact price of the product that he will be charged. Thus, there are no unexpected price differences between the price shown on the shelf and the price on charged on the cashier counter.

Figure 4. Electronic price tags (Institute for information industry, Innovative DigiTech-Enabled Applications & Services Institute, IDEAS, 2012)

Digital Advertising Displays consist of a flat screen display that shows interactive advertisements of products and promotions. This is an interactive way to provide more information to consumers than classic POS promotional materials. It also decreases the cost of printing POS materials, it is more environmentally friendly, and it is interactive and can be changed easily.

Figure 5. Digital advertising display (Institute for information industry, Innovative DigiTech-Enabled Applications & Services Institute, IDEAS, 2012)

Concepts from the METRO Group Future Store are currently being developed and implemented in several stores. However, SSTs are not just a concept that belongs to the future. There are different kinds of SSTs that are currently widely applied in retailing stores beside the conventional retailing service. One of those widely used SSTs is self-scan checkout, that isused to replace the checkout clerk. This is still emerging technology, applied in developed counties, with huge pprospects for wider usage. Self-scan checkouts are an example of an innovative SST. Self-scan checkouts enable customers to scan the barcodes of their products, pay for the products

and put them into bags on their own, without the help of service employees (Schliewe & Pezoldt, 2010).

Figure 6. Self-scan checkouts (Institute for information industry, Innovative DigiTech-Enabled Applications & Services Institute, IDEAS, 2012, 2012)

Self-scan checkouts have benefits both for consumers and retailers. Technological innovations offer productivity and efficiency benefits for retailers (Zeirhaml & Gilly, 1987). Retailing as a labor intensive business has a huge potential for SSTs. This important retailing technology decreases the number of employees and thus the cost of operations. Self-scan checkouts enable retailers to replace cashiers employees with technology that is run by consumers.

Technological innovations in retailing also yield strong consumer advantages (e.g. speed, accuracy, economy) over retailing services not based on SSTs (Zeirhaml & Gilly, 1987). Meuter et al. (2000) identified main advantages of SSTs as better than the alternatives. The advantages include: ease of use, avoiding service personnel, saving time, saving money, used when and where consumers want. The benefit of self-scan checkouts for consumers are reduced checkout

time because stores are often able to run two to six self-scan checkout units in the place of a single cahiers (Schliewe & Pezoldt, 2010).

Before implementation retailers should account for costs and factors related to consumer acceptance of technology. To avoid unnecessary costs of implementation of technology, retailers should make sure their customers appreciate the technology and are willing to use it. Otherwise, the return on investment for retailer will be very low. According to Curran, Meuter & Surprenant (2003) before introducing self-service technologies service providers should conduct research to better understand consumers' attitudes toward the service providers, technologies, and their intentions to use technology based self-service systems.

Consumers' attitudes and intentions to use are very important. Researches have shown that it is not uncommon for products to have high rates of adoptation in particular counties but low rates in other countires. (Van Everdingen & Waarts, 2003). According to this the adoption rate of different self- service technological products could vary in different countries. However, retailing business is getting more and more globalized. Large numbers of retailers are opening their stores in counties with different cultures than the culture of the country of their origin. To be able to implement their technology strategies in different cultural environments, retailers need to understand how culture itself influence consumer adoption of self-service technologies.

Most researches about technology acceptance rely on the customer behavior in the USA and Western Europe. There is little research demonstrating that the usage of SST is similar in other cultures in Asia (Schliewe & Pezoldt, 2010). There is a research gap in cross-cultural comparison of technology acceptance between Western and Eastern culture. The world is getting more and more globalized and retailers are spreading their business worldwide. Therefore it is

very important to understand the differences and similarities in acceptance of SSTs in retailing, between different cultures.

2.2. Self – service technology adoption factors

One of the most influential and widely used models in the research related to self-service technology adoption and generally technology acceptance is Technology Acceptance Model (TAM). TAM, introduced by Davis (1986), is an adaptation of Theory of Reasoned Actions by Fishbein and Ajzen. It is specifically design for modeling user acceptance of information systems. Its key purpose is to provide a basis for tracing the impact of external factors on internal beliefs, attitudes, and intentions (Davis, Bagozzi, & Warshaw, 1989). It assumes that the perceived usefulness (PU) and the perceived ease of use (PEOU) are central in influencing a person's attitude and behavioral intention towards using technology (Schepers & Wetzels, 2007).

As presented TAM concentrate on two factors: perceived usefulness and perceived ease to use. These two factors are related to technology characteristics. According to Lockett & Littler (1997) there are two categories of factors that influence acceptance of new technology. The first is related to perceived innovation characteristics and the second is related to and personal characteristics of consumers.

However, there is no general framework or concept used to analyze the acceptance of SST by consumers. According to a review of SSTs literature published over a ten year period, there are over 60 publications related to SST acceptance. The review shows that there are 29 different self-service factors that influence the adoption of SSTs (Kelly, Lawlor, & Mulvey, 2010).

Personal characteristics have been identified as important psychological determinants of technology acceptance. These characteristics include constructs like social pressure, self-efficacy

and technology anxiety (Eastin, 2002; Meuter et al., 2003; Meuter et al., 2005; Nysveen et al., Schliewe & Pezoldt, 2010). Social pressure or subjective norms are defined as the degree to which an individual believes that people who are important to themselves influence their actions to do something (Fishbein & Ajzen, 1975). In the case of this research the degree where by others in the groups influence the individual to use self-scan checkouts is measured. The perceived self-efficacy relates people's beliefs to their capabilities to produce given activities (Bandura, 1977). There is a positive relationship between self-efficacy and technology acceptance and therefore customers with higher self-efficacy are expected to have more confidence in their ability to use self-scan checkouts (Schliewe & Pezoldt, 2010). Technology anxiety is related to the level of anxiety of an individual, or level of comfort with decision to use a new technology (Igbaria & Parasuraman, 1989). According to Meuter et al. (2005), technology anxiety may lead to confusion related to the ability of individual regarding ability of a task to be performed. Studies have shown that technology anxiety is expected to have negative effects on consumers' usage of SSTs (Meuter et al., 2005).

2.3. Cultural dimension

Zhang, Beatty, and Walsh (2008) have reviewed twenty major services research journals. In these journals, forty published articles, focused on cross-cultural consumer services research. According to their research the most popular categorization of cultural dimensions is the framework proposed by Hofstede. Out of forty reviewed articles, twenty seven incorporate Hofstede's cultural dimensions in their study. Due to the popularity and importance of Hofstede's cultural dimensions framework, this approach is applied in this Master Thesis research.

National cultures are defined as patterns of thinking, feeling, and acting that are rooted in common values and societal conventions (Nakata & Sivakumar, 2001). According to this definition the most important for culture is that it applies to a group of people and influences their way of thinking, feeling and acting. Different cultural dimensions could be used for categorization of cultures. As already presented the most popular categorization is proposed by Hofstede. Clustering cultures is important for easier comparison and creation of patterns for understanding of consumer behavior.

Hofstede (1980) published the results of a study of more than 100 000 employees of the multinational IBM in 40 countries. According to the research, Hofstede identified four cultural dimensions: individualism vs. collectivism, masculinity vs. femininity, high power of distance vs. low power of distance, and high uncertainty avoidance vs. low uncertainty avoidance.

Individualism is related to society in which the ties between individuals are loose: people are taking care about themselves and their close family only, with low level of concern about the rest of society. In other hand, collectivism is related to society in which people are integrated and cohesive in groups, and have strong loyalty to the group. (Hofstede, 2008). People in individualistic cultures see themselves as more independent persons, and people in collectivistic cultures are more related and responsible to the group (Yeniyurt & Townsend, 2003). Individualistic and collectivistic cultures differ in the connection between individuals and groups. This refers to the priorities of individual. Whether individuals priorities are his own wishes, values and believes, or he tends to give higher priority to group's decisions. The individualism dimensions concerns the relationship between the individual and the group to which that individual belongs. People in individualistic countries are encouraged to make their own choices, while people in collective countries are more willing to conform to the norms of the group

(Erumban, & Jong, 2006). Members of individualist cultures feel free to express their own views and act according to their believes, therefore they are more willing to innovate and adopt new ideas (Erumban, & Jong, 2006). Counties with higher score of individualistic dimension have higher coefficient of innovation (Yaveroglu, & Donthu, 2002). According to Yeniyurt & Townsend (2003), individualism has a positive effect on penetration rate of new products. Due to presented characteristics of individualistic culture as a culture where people tend to follow their own motives and are more innovative it is expected that people from individualistic cultures are more willing to accept in store technologies as self-service checkouts.

Masculinity cultures are characterized by competition, ambition and focus on performances and material values. Femininity cultures are characterized by solidarity, equality, consensus seeking and concern about social relationships (Erumban, & Jong, 2006). In masculinity cultures there is very clear task orientation and orientation toward achieving special goals and material values. The whole society is oriented and scaled according to these values. According to Swar, Kim, Lee, and Moon (2009) it is expected that counties with a high masculinity culture will show a higher rate of mobile phone diffusion than counties with a lower masculinity culture. Therefore it could be concluded that masculinity cultures are more willing to adopted new and advanced products and technologies. This is supported by previous research which stated that there is apparent connection between acceptance of new things in society and high masculinity cultural dimension (Yeniyurt & Townsend, 2003).

The third cultural dimension proposed by Hofstede is power of distance. It had two degrees: low power of distance or high power of distance. The main characteristic of dimension power of distance is the extent to which less powerful people from the society expect and accept that the power is distributed unequally (Hofstede, 1980). The power of distance refers to the

inequality of the distribution of power in a country (Erumban & Jong, 2006). In societies with a high degree of power of distance, status and age are very important; generally, people tend to be less innovative (Yeniyurt, & Townsend, 2003). As presented in high power of distance cultures, status is very important, therefore innovativeness is lower. Due to the importance of status, members of the society do not feel motivated and comfortable to express their new visions and ideas, this leads to lower level of innovativeness. It could also be applied to acceptance of new things. Acceptance of new is related to expressing different mindset and change in comparison with established rules. High power of distance will decrease willingness of society members to express their likeliness of new products. In cultural environment where is present high level of power of distance, society members are less open to new ideas and products, therefore the penetration rates of new products is expected to be lower (Yeniyurt, & Townsend, 2003).

The last cultural dimension presented by Hofstede (1980) is uncertainty avoidance. This dimension could vary across counties and be identified as low or high uncertainty avoidance. The main characteristic of uncertainty avoidance is orientation of society members toward new and unknown. According to Hofstede (1980), uncertainty avoidance is related to the degree to which members of a society feel uncomfortable with uncertainty and ambiguity. Therefore people from cultures with lower level of uncertainty avoidance are more tolerant to risk and more willing to try new things. According to Yeniyurt and Townsend (2003) uncertainty avoidance has a negative effect on the acceptance rates of new products. People in cultures with higher level of uncertainty avoidance are less willing to change their routine and life patterns (Steenkamp, Hofstede, & wedel, 1999). Therefore uncertainty avoidance could be related to consumer willingness to adopt new technologies, including self-service technologies in retailing.

Prior studies have shown that individualism and uncertainty avoidance are the two variables that are important to consumers' acceptance of innovations in different cultures (Lim, Leung, Sia, & Lee, 2004). Individualism is expected to be positively related to technology acceptance within early adopters and uncertainty avoidance is expected to be negatively related to technology acceptance (Van Everdingen & Waarts, 2003).

2.4. Cultural dimensions of Taiwanese and Swedish

The cultural dimensions of this research are formulated according to Hofstede's cultural dimensions (1980). Prior research shows that two of these dimensions – individualism and uncertainty avoidance are related to consumer acceptance of innovations (Lim et al., 2004). Thus, these two cultural dimensions have been selected among the group of Hofstede's cultural dimensions. Taiwanese and Swedish culture will be analyzed according to individualism and uncertainty avoidance.

2.4.1. Taiwanese culture

Taiwan R.O.C. is an island country situated in the Pacific Ocean in South-East Asia. Its citizens are mostly leaded by Chinese culture and the influence of Confucianism. According to Hofstede's (2013) cultural dimensions, Taiwan is perceived as society with high power of distance, high uncertainty avoidance, collectivism, femininity and long term orientated culture (according to Hofstede, 2013). These characteristics are graphically presented in Figure 7 and represent Hofstede's numerical values for cultural dimensions.

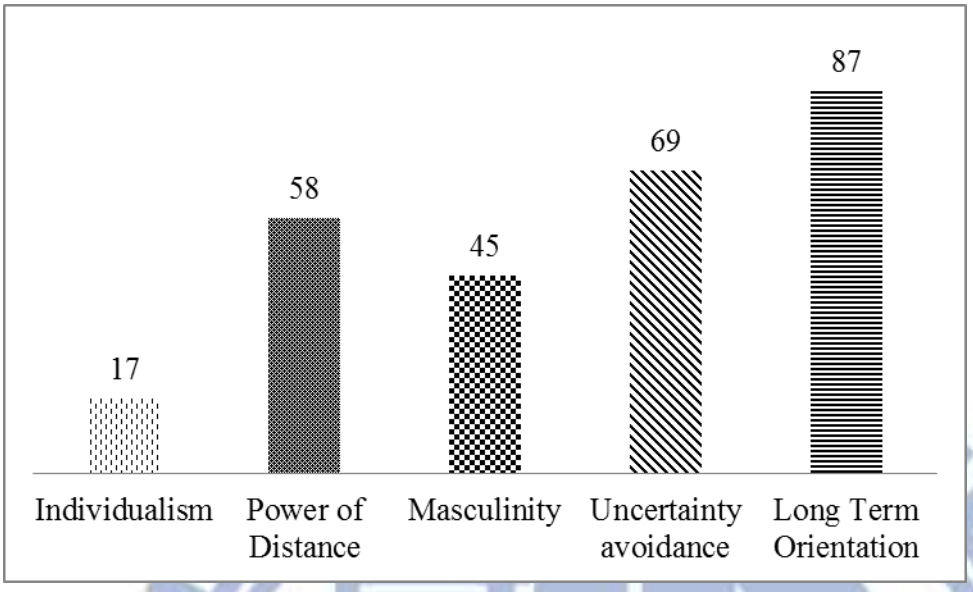


Figure 7. Cultural dimensions for Taiwan R.O.C. (Hofstede, 2013)

Taiwan, with score of 17 of individualistic dimension, is considered as collectivistic society (Hofstede, 2013). Taiwanese are collectivistic oriented, therefore the perception and opinion of the group is more important than the opinion of an individual. Members of collectivistic cultures tend to follow the groups decisions. Once a products or innovation is accepted and approved by the society, individuals will quickly and easily accept it. According to Yeniyurt & Townsend (2003), individualism has a positive effect on penetration rate of new products. Thus, it is expected that Taiwanese will have lower level of retail innovations acceptance.

Taiwan's score for uncertainty avoidance is 69 and it is considered as high preference for avoiding uncertainty (Hofstede, 2013). High level of uncertainty avoidance may predict that Taiwanese will have a low level of retail innovations acceptance. Individualism and uncertainty avoidance are congruent with the attitude toward the acceptance of retail innovations. Both of

them show that Taiwanese culture according to Hofstede's dimensions (1980) is negatively oriented toward acceptance of retail innovations.

2.4.2. Swedish culture

Sweden is a North European country. It is characterized by a typical Western European cultural orientation of equality, open minded and self-respect. According to Hofstede's (2013) cultural dimensions, Sweden is perceived as a society with low power of distance, low uncertainty avoidance, individualistic, femininity and short term orientated culture (according to Hofstede, 2013). These characteristics are graphically presented in Figure 8 and represent Hofstede's numerical values for cultural dimensions.

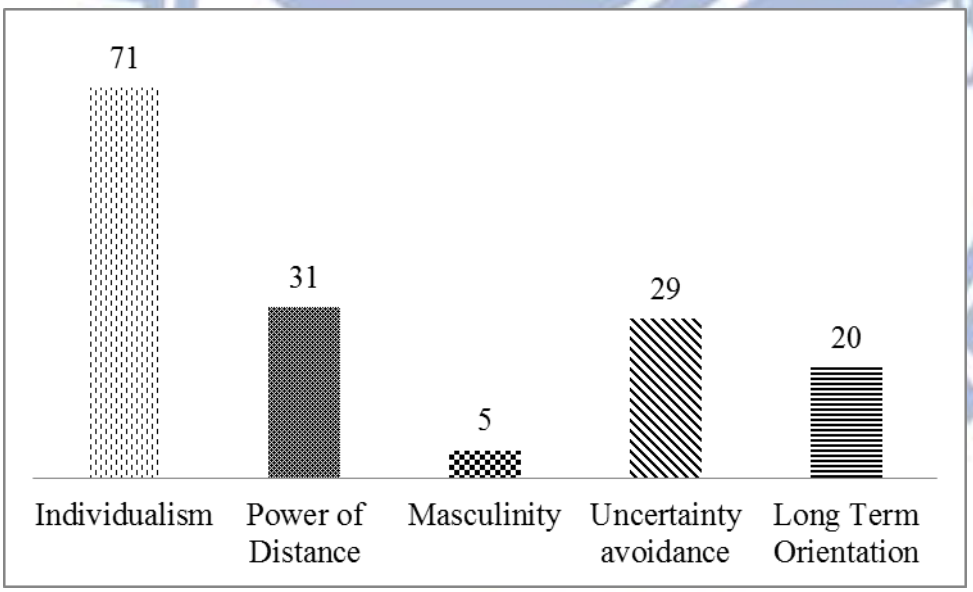


*Figure 8. C*ultural dimensions for Sweden (Hofstede, 2013)

Sweden, with score of 71 of individualistic dimension, is considered as individualistic society (Hofstede, 2013). Swedish consumers are individualist oriented and therefore the perception and opinion of an individual or close family is more important than the perception of a group. Members of individualist cultures are more likely to look after themselves and their direct family (Hofstede, 2013). Individualistic cultures are very often very creative, as differences and individuals perceptions are more appreciated, than following the group's opinion. Members of individualist cultures have high level of innovations (Yaveroglu, & Donthu, 2002). According to Yeniyurt & Townsend (2003), individualism has a positive effect on the penetration rate of new products. Thus, it is expected that Swedish will have high level of retail innovations acceptance.

Sweden's score for uncertainty avoidance is 29 and it is considered as low preference for avoiding uncertainty (Hofstede, 2013). Low level of uncertainty avoidance may predict that Swedish will have a high level of retail innovations acceptance. Individualism and low level of uncertainty avoidance are congruent with the attitude toward the acceptance of retail innovations. Both of them show that Swidish culture according to Hofstede's dimensions (1980) is positively oriented toward acceptance of retail innovations.

2.4.3. Comparison of Taiwanese and Swedish culture

Culture itself is very complicated and it includes many elements. Therefore a simplified approached will be used. In this section, Taiwanese and Swedish culture will be compared according to Hofstede's cultural dimensions. Specifically, these two cultures will be compared according to individualism/collectivism and high/low uncertainty avoidance. These two cultural dimensions are selected, as prior researches have shown that they are relevant for studying usage of innovations in different cultures (Van Everdingen & Waarts, 2003).

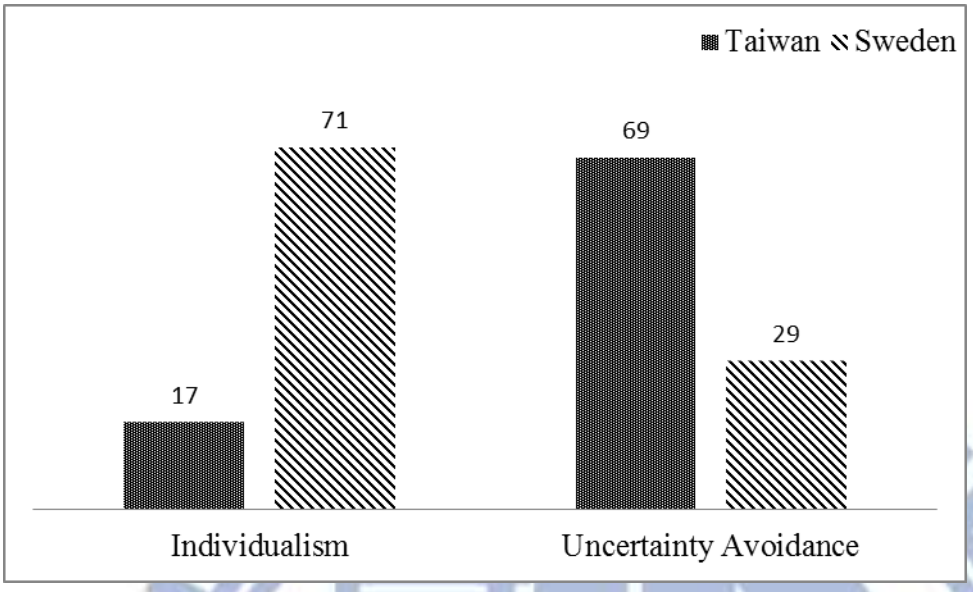


Figure 9. Cultural dimensions for Taiwan and Sweden (Hofstede, 2013)

According to visually presented data on Figure 4 (Hofstede, 2013), Taiwan and Sweden are characterized by opposite cultural dimensions. While Taiwan with has a low score of individualism s perceived as a collectivistic culture, Sweden with a high score and is perceived as an individualist culture. Moreover, Taiwan with high score of uncertainty avoidance is characterized as high uncertainty avoidance society and Swedish have tendency toward low uncertainty avoidance.

As Taiwan and Sweden are opposite in terms of two cultural dimensions that are relevant for studying usage of innovations in different cultures (Van Everdingen & Waarts, 2003), it is expected that Taiwanese and Swedish' attitude toward retail innovations will be opposite. While Swedish are expected to have positive attitude and high level of acceptance of retail innovations, Taiwanese are expected to have lower level of acceptance of retail innovation. Due to opposite cultural dimensions, these two counties, which represent a western European and eastern Asian

culture are an excellent sample for analyzing the influence of cultural dimensions on adoption of retail innovations.

2.5. Relation between self-service adoption factors and cultural dimensions

Three analyzed SST adoption factors, social pressure, self-efficacy and technology anxiety, are related to cultural characteristics. Individualism as cultural dimension is related to relationship between individuals and society or group. Therefore SST adoption factor social pressure is connected to individualism cultural dimension. People in individualistic cultures see themselves as more independent persons, and people in collectivistic cultures are more related and responsible to the group (Yeniyurt & Townsend, 2003). Thus, it is expected that Swedish as individualist culture (Hofstede, 2013) will have lower influence of social pressure on their decision to use retail innovation. The opposite apply to Taiwan, as it is considered as collectivistic culture (Hofstede, 2013).

Uncertainty avoidance as cultural dimension is related to self-efficacy and technology anxiety. According to Hofstede (1980), uncertainty avoidance is related to the degree to which members of a society feel uncomfortable with uncertainty and ambiguity. Higher the uncertainty avoidance is, lower will be the self-efficacy and higher will be the technology anxiety. Thus, it is expected that Swedish as low uncertainty avoidance culture (Hofstede, 2013) will have high self-efficacy and low technology anxiety. The opposite apply to Taiwan, as it is considered as high uncertainty avoidance culture (Hofstede, 2013).

III. Research Methodology

This chapter is divided into four sections. The first section summaries the research hypothesis, which will be tested through the primary research. It includes the justification of hypothesis and the logic flow to their creation. The second section proposes a research framework to help understand research questions and their connection. The third section describes pre-survey procedures and results. The fourth section explains research design, sample characteristics and procedures.

3.1. Research hypotheses

Primary research itself is divided into two parts. The first part measures role of cultural dimensions on the acceptance of retail innovations. The second part measures consumers' attitude toward five different types of retail innovations, including Personal Shopping Assistant (PSA), Intelligent Weighing Scale, Electronic price tags, Digital Advertising Displays, Self-scan Checkouts. Therefore the research hypotheses are also divided into two categories.

Analyzed SST adoption factors, including social pressure, self-efficacy and technology anxiety influence the adoption of retail innovation. They are seen as independent variables. This research proposes cultural dimensions (individualism/collectivism and uncertainty avoidance) as moderator factors in the adoption of retail innovations. Moderator factors of this research are cultural dimensions and independent variables are SST adoption factors. Those factors are combined in consideration with Taiwanese and Swedish culture. Based on that the following hypothesis have been formulated:

H1a: Given a Taiwanese collectivistic culture, consumers will experience higher levels of social pressure which negatively effects retail innovation acceptance in comparison to the Swedish consumers;

H1b: Given a Swedish individualistic culture, consumers will experience lower levels of social pressure which positively effects retail innovation acceptance in comparison to the Taiwanese consumers;

H_{2a}: Given a high level of uncertainty avoidance, Taiwanese consumers show a low level of self-efficacy which negatively effects retail innovation acceptance in comparison to the Swedish consumers;

H_{2b}: Given a low level of uncertainty avoidance, Swedish consumers will have a higher level of self-efficacy which positively effects retail innovations acceptance in comparison with Taiwanese consumers;

H_{3a}: Given a high level of uncertainty avoidance, Taiwanese consumers have a higher level of technology anxiety which will negatively effects retail innovation acceptance in comparison with Swedish consumers;

H_{3b}: Given a low level of uncertainty avoidance, Swedish consumers have a lower level of technology anxiety which positively effects retail innovation acceptance in comparison with Taiwanese consumers;

Collectivistic culture negatively affects users' acceptance of retail innovation. Oppositely, it is expected that individualistic culture will positively affects users' acceptance of retail innovations. Influence of collectivistic/individualist culture on acceptance of retail innovations goes through independent variable of social pressure. Uncertainty avoidance will negatively affect the users' acceptance of retail innovations. Higher the uncertainty avoidance is lower the

acceptance of retail innovations will be. Influence of uncertainty avoidance culture goes through independent variable, including technology anxiety and self-efficacy. Uncertainty avoidance is positively related to technology anxiety, which itself is negatively related to retail innovations acceptance. Higher the uncertainty avoidance is higher the technology anxiety is, lower the users' acceptance of retail innovations is. Uncertainty avoidance is negatively related to self-efficacy witch itself is positively related to retail innovation acceptance. Higher the uncertainty avoidance is lower the users' acceptance of retail innovation is.

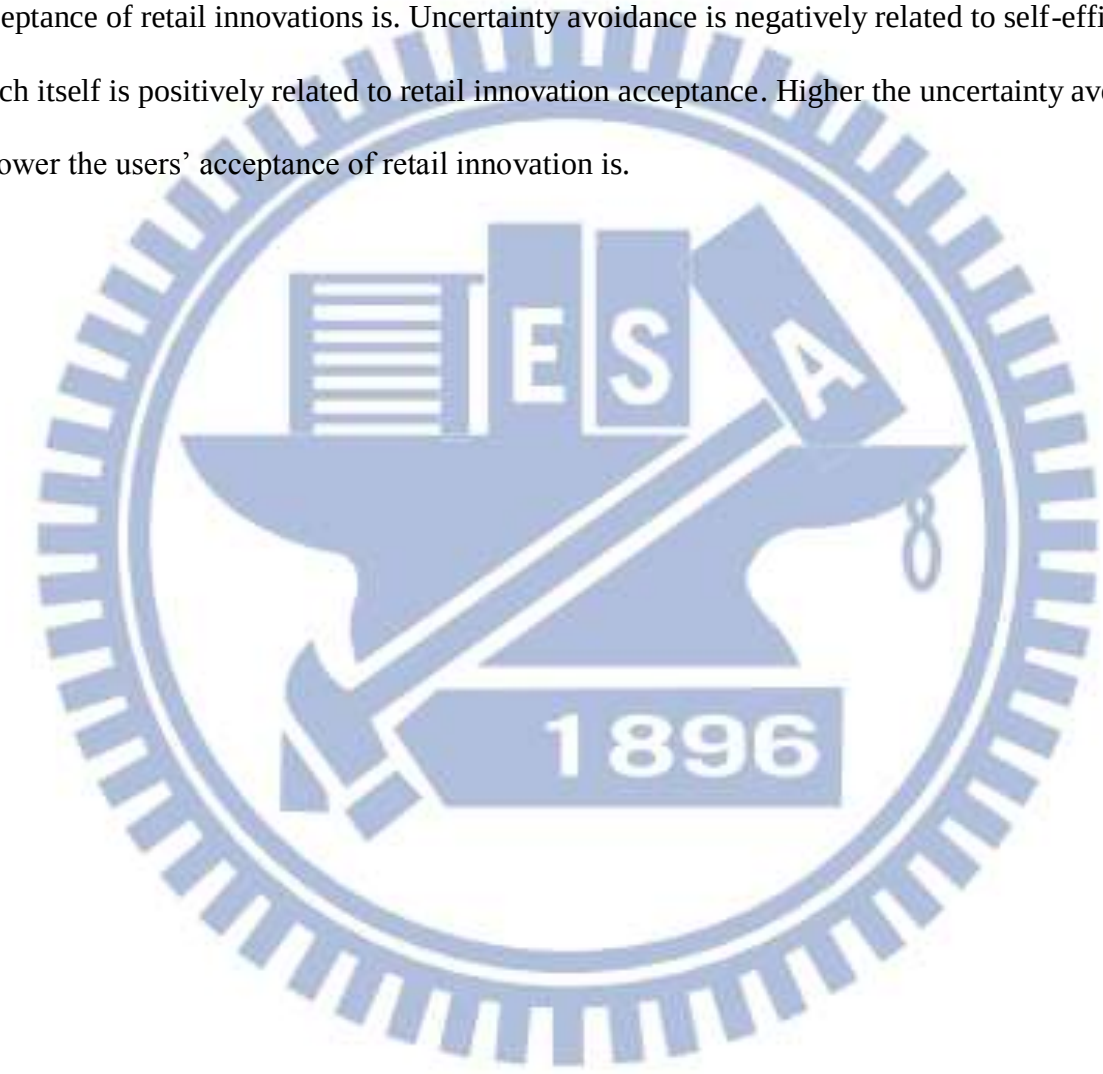


Table 1.

Justification of hypotheses

Hypothesis	Justification	Supporting Literature
H1a, H1b, H4a, H4b	Individualism has a positive effect on penetration rate of new products	Yeniyurt & Townsend, 2003
	Taiwan with score of 17 of individualistic dimension is considered as collectivistic society	Hofstede, 2013
	Sweden with score of 71 of individualistic dimension is considered as individualist society	Hofstede, 2013
	There is a positive relationship between social pressure and intention for usage of self-service technologies	Hung et al., 2002
H2a, H2b, H3a, H3b, H4a, H4b	Uncertainty avoidance has a negative effect on the acceptance rates of new products.	Yeniyurt & Townsend, 2003
	Taiwan with score of 69 is considered as high preference for avoiding uncertainty.	Hofstede, 2013
	Sweden with score of 29 is considered as low preference for avoiding uncertainty.	Hofstede, 2013
	There is a positive relationship between self-efficacy and technology acceptance.	Schliewe & Pezoldt, 2010
	Technology anxiety is expected to have negative effects on consumers' usage of self-service technology.	Meuter et al., 2005

Note. Provided definitions and previous researches' conclusions lead to construction of the hypothesis of this research. The independent variables (social pressure, self-efficacy and technology anxiety) and moderators (individualism and uncertainty avoidance) that construct the framework of the research are justified.

The second part of the primary research uses the multi-attribute model for evaluation of attitudes toward five retail innovations. The tested retail innovations include innovations proposed by Metro Future Store (Kalyanam, Lal, & Wolfram, 2010). Respondents are asked to evaluate issues and importance for each of the five retail innovations. According to collectivistic and uncertainty avoidance culture it is expected that innovations with lower level of self-service and lower level of technology development will have higher evaluation score from Taiwanese. The opposite is expected to receive higher evaluation score from Swedish. As they are not influenced by social pressure and have positive attitude toward uncertainties. Five retail innovations are ranked according to their level of self-service and technological innovations. The innovation with the highest level of self-service is PSA, followed by self-scan checkouts and intelligent weighting scale. Electronic price tags and digital advertising displays have the lowest level of self-service. As consumers do not need to use them, they just look at them to receive information. However, the level of self-service for price tags is higher than digital advertising displays, as every consumer need to use electronic price tags while shopping, but digital advertising displays are not mandatory to be used.

Thus, formed are hypothesis of this research:

H_{4a}: Given a Taiwanese collectivistic and high uncertainty avoidance culture, consumers prefer retail innovations with lower level of self-service and lower level of technology development

(The highest preference is for Digital Advertising Displays, followed by Electronic price tags, Intelligent Weighing Scale, Self-scan Checkouts, Personal Shopping Assistant);

H_{4b}: Given a Swedish individualistic and low uncertainty avoidance culture, consumers will prefer retail innovations with higher level of self-service and higher level of technology development (The highest preference is for Personal Shopping Assistant, followed by Self-scan Checkouts, Intelligent Weighing Scale, Electronic price tags, Digital Advertising Displays).

3.2. Research framework

According to the literature review, research framework is proposed. It is visually presented on Figure 10 and Figure 11. This research studies the role of cultural dimensions in the acceptance of retail innovations. It analyzed this influence through two prisms. First it analyses the influence of cultural dimensions on acceptance of retail innovations at general. Second it analyzed consumer evaluation of different retail innovation types across cultures.

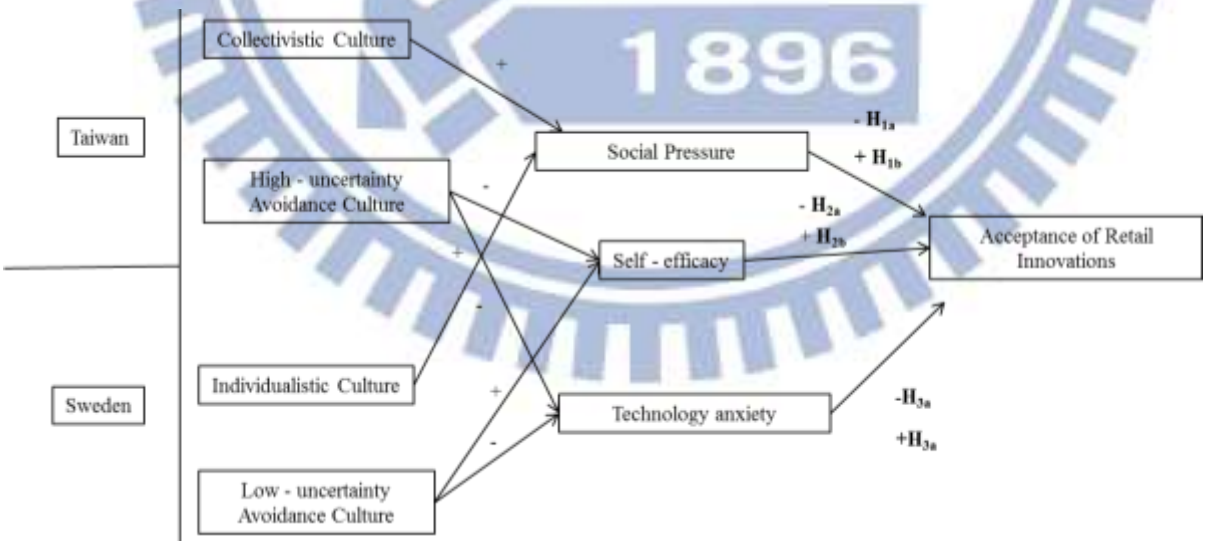


Figure 10. Research framework – part 1

Note. Independent variables are social pressure, self-efficacy and technology anxiety. They influence the dependent variable users' acceptance of self-scan checkout. Moderators in the model are cultural dimensions that influence the relationship of independent and dependent variables.

Figure 11. Research framework for Taiwan– part 2

Note. Independent variables are social pressure, self-efficacy and technology anxiety. They are moderated by moderating variables of cultural dimensions. Due to collectivistic culture and high uncertainty avoidance culture Taiwanese will overall highly evaluate innovations with lower level of self-service and technology development.

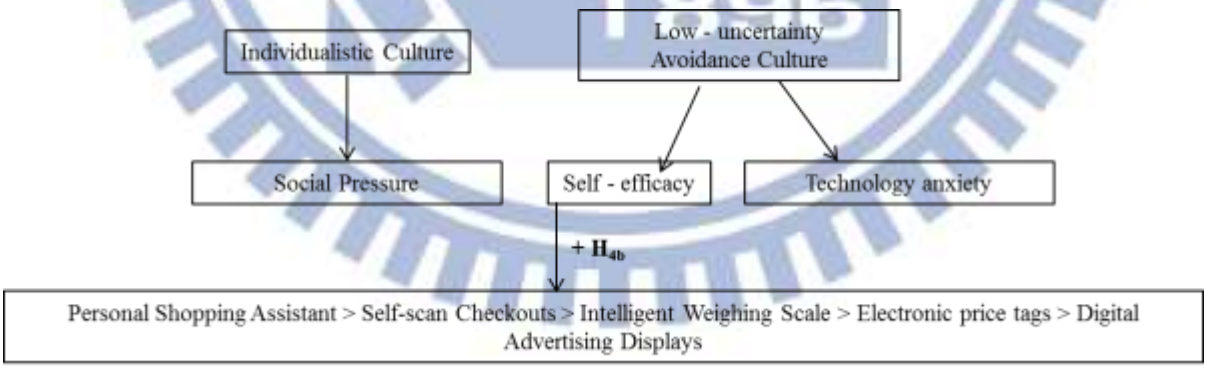


Figure 12. Research framework for Sweden– part 2

Note. Independent variables are social pressure, self-efficacy and technology anxiety. They are moderated by moderating variables of cultural dimensions. Due to individualistic culture and low uncertainty avoidance culture Swedish will overall highly evaluate retail innovations with higher level of self-service and technology development.

3.3. Pre-survey

In order to ensure verification of the primary research method pre-survey will be conducted. It represents a simplified format of the research survey. The purpose of pre-survey is to ensure that participant truly understand the questions and are able to clearly answer. In order to enhance the validity and reliability of this research, it is important to conduct pre-survey. It will provide necessary information about participants understanding of research questions. This is especially important because most of the participants have never used advanced retail technologies that are included into the research survey. The survey is based on and adapted from a cross cultural survey designed by Schliewe & Pezold (2010). Thus, its validity and reliability is already proven. Therefore the main purpose of the pre-survey is to ensure that participants are able to clearly understand the survey questions.

Pre-survey is conducted on sample of 30 Taiwanese. Convenient sample of university students from National Chiao Tung University, Hsinchu, Taiwan is selected. Pre-survey is simplify, thus it includes one nation – Taiwanese and one retail innovation – self-scan checkout. The survey consists of three sections including an introduction and picture used to define self-scan checkout, three series of questions used to test the primary hypotheses, and questions used to collect demographic information. The questions used to test the primary hypothesis are separated into three series. The first part includes five questions and tests social pressure, or the

importance of the opinion of relevant persons to individuals considering the use of self-scan checkouts. The second part consists of six questions and measures the self-efficacy or the level of confidence of respondents to use self-scan technology. The last part consists of eight questions to test respondents' technology anxiety and their attitude toward technology usage. Respondents were asked to answer the questionnaire as a means to test the primary hypotheses. The questionnaire measured responses using a five-point scale ranging from "strongly agree" to "strongly disagree".

Convenient sample of university students allowed direct survey. Thus, the author was able to communicate with the participants and to observe if there is any problematic part of the survey, that need to be changed and adopted to specific culture sample.

3.4. Sample and procedures

Primary data is collected using a paper survey and e-mail survey distributed to convenient sample of university students. Taiwanese nationality participants are students of National Chiao Tung University, Taiwan. Swedish nationality participants are students of Chalmers University of Technology, Sweden. Paper questionnaires were filed and kept. Also for each of the questionnaires sent back by E-mail, the correspondence was recorded, filed and kept.

The total number of sent out questionnaires is 100. Where 50 questionnaires are sent among Taiwanese students and 50 questionnaires are sent among Swedish students. The total return rate 89%. Where the return rate for Taiwanese students is 96% (or 48 questionnaires are sent back). . The return rate for Swedish students is 82% (or 41 questionnaires are sent back).The difference among the return rate of two sample categories is expected. The reason behind is geographical distance between the sample and author. The correct questionnaires among the

returned are 73. This means 73% of sent questionnaires are returned and correct and can be used in the analysis of primary research results.

Small incentives in a form of chocolate desserts were given to every participant as a sign of appreciation for their interest in academic research and their valuable contribution to the better understanding of the role of cultural dimensions in the acceptance of retail innovations. The questionnaire is originally created in English language. It has been translated by professional Chinese – English translator into Chinese language. Once translated into Chinese language it has been back translated into English. This ensured validity and reliability of the translation. Chinese version of the questionnaire is used for survey among Taiwanese students. Among Swedish students the original English survey has been used since Swedish students are bilingual and there is no language barrier in understanding the survey questions.

A convenient sample of university students was used since the importance of students as retail customers is well known. They are relevant customers and future society leaders. In few years they will be family leaders and very often will visit retailers' stores. Therefore for future technology innovations strategy for retailer is important to understand behavior of students as leading indicators for future retail innovations.

Students as respondents are also important due to globalized world. In todays globalized world borders between cultures started to be thinner and thinner. Therefore a research among students will bring to new understanding about influence of globalization world on national cultural dimensions. Especially on cultural dimensions uncertainty avoidance and its relation with self-efficacy and technology anxiety.

3.5. Questionnaire design

The questionnaire consists of two parts. In the first part students were asked questions about their attitudes toward retail innovations as general category. In the second part, students were asked questions about their beliefs and importance related to five different types of retail innovations.

The first part of the questionnaire was based on and adapted from a cross cultural survey designed by Schliewe & Pezoldt (2010). The first part of the survey includes three series of questions used to test the primary hypotheses ($H_{1a,}$ $H_{1b,}$ $H_{2a,}$ $H_{2b,}$ H_{3a}, $H_{3b)}$. The questions used to test the primary hypothesis are separated into three series. The first part includes five questions and tests social pressure, or the importance of the opinion of relevant persons to individuals considering the use of self-scan checkouts. The second part consists of six questions and measures the self-efficacy or the level of confidence of respondents to use self-scan technology. The last part consists of eight questions to test respondents' technology anxiety and their attitude toward technology usage. Respondents were asked to answer the questionnaire as a means to test the primary hypotheses. The questionnaire measured responses using a five-point scale ranging from "strongly agree" to "strongly disagree".

The second part of the questionnaire is based on multiattribute attitude model for evaluating retail innovations based on a weighted-average score (Lewy & Weitz, 2012). Questionnaire starts with an introduction and picture used to define five retail innovations. This ensures that respondents are familiar with the retail technology and are able to understand questions related to these five innovations. Respondents were asked to rank their importance of retail store attributes on seven point scale and to relate these importance with their beliefs about

each of five retail innovations on five point scale. Answers are used for obtaining overall evaluation of every of five retail innovations.

IV. Research results and analysis

In the following chapter are presented and analyzed data collected in the form of a primary research. Those results will be used for verification of the hypothesis of this research. The first section of this chapter presents descriptive statistics of the sample. The second section will cover analysis of collected data related to the influence of cultural dimensions on the acceptance of retail innovations. The last part will cover analysis of data related to the consumers' evaluation of different retail innovation types across cultures.

4.1. Sample descriptive statistics

The bases of this research are formed on the cross-cultural comparison. Therefore the primary research had two sample categories. The first category is represented by Taiwanese students. The second category is represented by Swedish students.

Forty (40) Taiwanese students participated in the research. In other hand the number of Swedish students is thirty-three (33). Both females and males have taken a part in the research. Gender distribution for both countries is visually presented on Figure 13. 30% (or 12) of all Taiwanese participants are males. 70% (or 28) are females. Participants from Sweden are almost equally separated with regard to gender. 52% (or 17) are male and 48% (or 16) are females from the Swedish nationality sample.

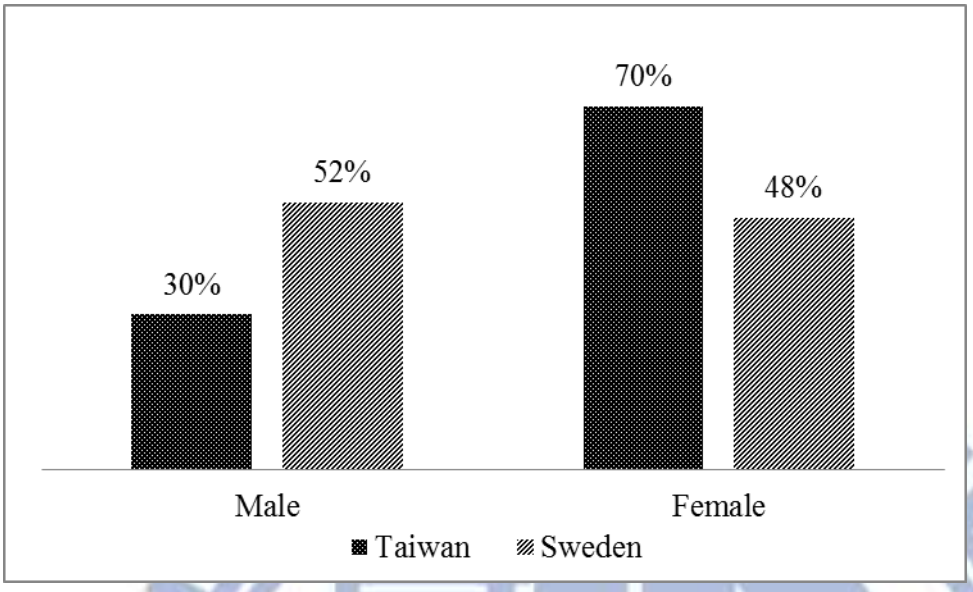


Figure 13. Sample size descriptive statistics – gender distribution

Survey questionnaire separated participants into four age categories, as following: 17-20 years old, 21-25 years old, 26-30 years old and 31 and more years old. These categories have been selected because the target participants of the primary research are students. Age distribution for both countries is visually presented on Figure 14. The majority of Taiwanese students' participants are in the age category from 17 to 20 years. 90% (or 36) of all participants are from this age category. The rest 10% (or 4) are in the next age category from 21 to 25 years old. Swedish participants are separated into three age categories. 33% (or 11) of them are in the age of 17 to 20. The majority of 61% (or 20) are from 21 to 25 years old. 2% of Swedish participants are in age of 26 to 30 years old.

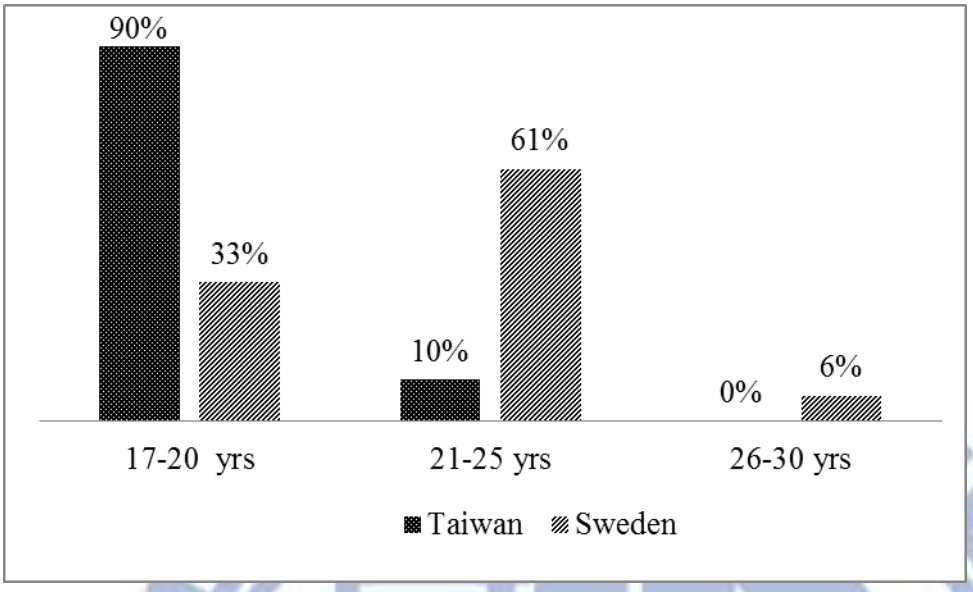


Figure 14. Sample size descriptive statistics – age distribution

4.2. The relationship between cultural dimensions and acceptance of retail innovations

The following section will analyze the influence of cultural dimensions on the acceptance of retail innovations. It is used for testing the first group of hypothesis, including $H_{1a,}$ H_{1b}, H_{2a}, H_{2b}, H_{3a} and $H_{3b.}$ As presented on *Figure 10.* Research Framework – part 1, this research study the influence of collectivistic/individualistic, high/low uncertainty avoidance cultures on the acceptance of retail innovations through social pressure, self-efficacy and technology anxiety. Therefore, this section is separated into three parts. The first part will study how social pressure influences the acceptance of retail innovations. The second part will study the role of self-efficacy on the acceptance of retail innovations. And the third section will concentrate on the role of technology anxiety on the process of acceptance of retail innovations.

4.2.1. The relationship between social pressure and cultural dimensions in the acceptance of retail innovations

The first six questions in the first part of the questionnaire are used for testing the influence of social pressure on the acceptance of retail innovations. Respondents were asked to rank the following statements on five point scale, from strongly agree to strongly disagree:

- The people who are important to me would think I should use retail innovations;
- It is expected that people like me would use retail innovations;
- People I look up to would expect me to use retail innovations;
- Most people who are important to me would approve of using retail innovations;
- The people who are important to me would agree that using retail innovations is a god thing.

Strongly agree is graded with 5, agree with 4, up to strongly disagree which is graded with 1. Therefore higher the grade for each statement is, higher the social pressure is. Means of all respondents from both groups – Taiwanese and Swedish are presented in Table 2.

Table 2

Overview of mean values of survey results for social pressure influence

	Mean Value for Taiwan	Mean Value for Sweden
The people who are important to me would think I should use retail innovations	3.38	2.91
It is expected that people like me would use retail innovations	3.90	3.09
People I look up to would expect me to use retail innovations	3.48	2.45
Most people who are important to me would approve of using retail innovations	3.43	2.97
The people who are important to me would agree that using retail innovations	3.68	2.76

Note. Provided results are mean value of all respondents from both groups – Taiwanese and Swedish. Those means present mean values of the statements used for testing the influence of the social pressure on the acceptance of retail innovations.According to data presented in Table 2, mean values for Taiwan related to social pressure are higher than mean values for Sweden. According to this the social pressure is higher for Taiwanese than Swedish. T-test has been used for testing is this difference in the social pressure level among the two groups significant.

Table 3 presents Group Statistics for t-test between Sweden and Taiwan, where tested variable is social pressure. Mean of social pressure for Taiwan is 3.570 and for Sweden is 2.836. Table 4 comments on the level of significant between these two countries.

Table 3

Overview of the group statistics for social pressure influence

Country	Variable	N	Mean	SD
Sweden	Social pressure	33	2.836	0.8328
Taiwan	Social pressure	40	3.57	0.5312

Note. Mean value, standard deviation value and standard error mean between groups of Taiwan and Sweden for tested variable social pressure are obtained. They are to be used for testing is there any significant difference among two countries.

Independent sample test has been performed to test the significant level of the mean differences. Levene's Test for Equality of Variances with significant level p= 0.006, that is less than 0.05, leads to conclusion that there is a significant difference between variances of Sweden and Taiwan. Therefore t-test for equality of means with equal variances assumed will be used.

The hypotheses used for t- test are as following:

H_0: $\mu_{Taiwan} = \mu_{Sweden}$

H_1: $\mu_{Taiwan} \neq \mu_{Sweden}$

T-test for equality of means with p value of 0, that is smaller than 0.05 (<0.05) leads us to rejection of null hypothesis. Therefore we can conclude that with 95% of confidence mean of

social pressure of Taiwanese students is significantly higher than the mean of social pressure of Swedish students.

Table 4

Overview of the results of independent sample test for social pressure influence

	T-test for equality of means				
Variable	t	df	Sig. (2 tailed)	Mean difference	Standard error difference
Social pressure	-4.56	71	0.0	-0.7336	0.1608

Note. Independent sample test is used for testing if there is significant difference among means for social pressure for groups of Taiwan and Sweden. With significant level of p=0, it can be concluded that there is significant difference among means for social pressure between the two tested groups. According to presented results it can be concluded that there is difference between the influence of social pressure to acceptance of retail innovations between Taiwanese and Swedish. Thus, this leads to acceptance of the H_{1a} and H_{1b} of this research:

H_{1a}: Given a Taiwanese collectivistic culture, consumers will experience higher levels of social pressure which negatively effects retail innovation acceptance in comparison to the Swedish consumers;

H_{1b}: Given a Swedish individualistic culture, consumers will experience lower levels of social pressure which positively effects retail innovation acceptance in comparison to the Taiwanese consumers;

Social pressure is influenced by collectivistic/individualistic culture. It can be concluded that collectivistic culture influences the higher social pressure. According to the results of this research higher the social pressure is lower the level of acceptance of retail innovations is. And

opposite, individualistic culture influences the lower social pressure. According to the results of this research lower the social pressure is higher the acceptance of retail innovations is.

4.2.2. The relationship between self-efficacy and cultural dimensions in the acceptance of retail innovations

The second six questions in the first part of the questionnaire are used for testing the influence of self-efficacy on the acceptance of retail innovations. Respondents were asked to rank the following statements on five point scale, from strongly agree to strongly disagree:

- I could use retail innovations without the help of others;
- I could use retail innovations if I had never used them before;
- I could use retail innovations if I could call someone for help if I got stuck;
- I could use retail innovations if no one showed me how to do it first;
- I could use retail innovations on my own;
- I could use retail innovations if I had seen someone else using them before.

Rank of these statements has been measured in a way where strongly agree is graded with 5, agree with 4, and up to strongly disagree which is graded by 1. Therefore higher the grade for each statement is, higher the self-efficacy is. Means of all respondents from both groups – Taiwanese and Swedish are presented in Table 5.

Table 5

Overview of mean values of survey results for self-efficacy influence

	Mean Value for Taiwan	Mean Value for Sweden
I could use retail innovations without the help of others	3.33	4.61
I could use retail innovations if I had never used them before	3.75	4.52
I could use retail innovations if I could call someone for help if I got stuck	3.43	4.61
I could use retail innovations if no one showed me how to do it first	3.30	4.58
I could use retail innovations on my own	3.73	4.64
I could use retail innovations if I had seen someone else using them before	4.33	4.55

Note. Provided results are mean value of all respondents from both groups – Taiwanese and Swedish. Those means present mean values of the statements used for testing the influence of the self-efficacy on the acceptance of retail innovations.

According to data presented in Table 5, mean values for Sweden related to self-efficacy are higher than mean values for Taiwan. According to this the self-efficacy is higher for Swedish than Taiwanese. T-test has been used for testing is this difference in the self-efficacy level among the two groups significant.

Table 6 presents Group Statistics for Sweden and Taiwan, where tested variable is self-efficacy. Mean of self-efficacy for Taiwan is 3.64 and for Sweden is 4.51. Table 7 comments on the level of significant between these two countries.

Table 6

Overview of the group statistics for self-efficacy influence

Country	Variable	N	Mean	SD
Sweden	Self-efficacy	33	4.509	0.6351
Taiwan	Self-efficacy	40	3.638	0.4667

Note. Mean value, standard deviation value and standard error mean between groups of Taiwan and Sweden for tested variable self-efficacy are obtained. They are to be used for testing is there any significant difference among two countries.

Independent sample test has been performed to test the significant level of the mean differences. Levene's Test for Equality of Variances has significant level p= 0.208, that is more than 0.05, thus it can conclude that there is no significant difference between variances of Sweden and Taiwan. Therefore t-test for equality of means with equal variances not assumed will be used.

The hypotheses used for t- test are as following:

H_0: $\mu_{Taiwan} = \mu_{Sweden}$

H_1: $\mu_{Taiwan} \neq \mu_{Sweden}$

T-test for equality of means with p value of 0, that is smaller than 0.05 (<0.05) leads us to rejection of null hypothesis. Therefore we can conclude that with 95% of confidence mean of self-efficacy of Swedish students is significantly higher than the mean of self-efficacy of Taiwanese students.

Table 7

Overview of the results of independent sample test for self-efficacy influence

	T-test for equality of means				
Variable	t	df	Sig. (2 tailed)	Mean difference	Standard error difference
Self-efficacy	6.557	57.497	0.0	0.8716	0.1329

Note. Independent sample test is used for testing if there is significant difference among means for self-efficacy for groups of Taiwan and Sweden. With significant level of p=0, it can be concluded that there is significant difference among means for self-efficacy between the two tested groups.

According to presented results it can be concluded that there is difference between the influence of self-efficacy to acceptance of retail innovations between Taiwanese and Swedish. Thus, this leads to acceptance of the H_{2a} and H_{2b} of this research:

H_{2a}: Given a high level of uncertainty avoidance, Taiwanese consumers show a low level of self-efficacy which negatively effects retail innovation acceptance in comparison to the Swedish consumers;

H_{2b}: Given a low level of uncertainty avoidance, Swedish consumers will have a higher level of self-efficacy which positively effects retail innovations acceptance in comparison with Taiwanese consumers

Self-efficacy is influenced by high/low uncertainty avoidance culture. It can be concluded that low uncertainty avoidance influences higher self-efficacy. According to the results of this research lower the uncertainty avoidance is higher the level of acceptance of retail innovations is. And opposite, high uncertainty avoidance culture influences the lower level of self-efficacy. According to the results of this research lower the self-efficacy is lower the acceptance of retail innovations is.

According to data presented in Table 5, self-efficacy has been tested through six statements. On the example of Taiwan, one of the statements highly oscillates from the mean of the all six statements. While mean of all six statements for Taiwan is 3.64, the mean for the statement: "I could use retail innovations if I had seen someone else using them before" is 4.33. Thus, the highest self-efficacy level for Taiwanese related to retail innovations is once they have seen how other people use it, or if they have gotten a tutorial how to use the technology. This is a very important managerial implication. To decrease the negative effect of high uncertainty avoidance and low level of self-efficacy on the acceptance of retail innovations, retailers should provide an education and educational materials to consumers before implementation of retail innovations.

4.2.3. The relationship between technology anxiety and cultural dimensions in the cceptance of retail innovations

The last eight questions in the first part of the questionnaire are used for testing the influence of technology anxiety on the acceptance of retail innovations. Respondents were asked to rank the following statements on five point scale, from strongly agree to strongly disagree:

- I have difficulty understanding most technological matters;
- Technological terminology sounds like confusing jargon to me;
- I am unconfident that I can learn technology-related skills;
- I hesitate to use technology for fear of making mistakes I cannot correct;
- I feel apprehensive about using technology;
- I have avoided technology because it is unfamiliar to me;
- I am not able to keep up with important technological advances;
- When given the opportunity to use technology, I fear I might damage it in some way.

Rank of these statements has been measured in a way where strongly agree is graded with 5, agree with 4, and up to strongly disagree which is graded by 1. Therefore higher the grade for each statement is, higher the technology anxiety is. Means of all respondents from both groups – Taiwanese and Swedish are presented in Table 8.

Table 8

Overview of mean values of survey results for technology anxiety

	Mean Value for Taiwan	Mean Value for Sweden
I have difficulty understanding most technological matters	2.68	1.94
Technological terminology sounds like confusing jargon to me	2.25	1.70
I am unconfident that I can learn technology-related skills	2.45	2.21
I hesitate to use technology for fear of making mistakes I cannot correct	2.58	1.58
I feel apprehensive about using technology	2.50	1.64
I have avoided technology because it is unfamiliar to me	2.60	1.61
I am not able to keep up with important technological advances	2.00	1.52
When given the opportunity to use technology, I fear I might damage it in some way	2.80	1.45

Note. Provided results are mean value of all respondents from both groups – Taiwanese and Swedish. Those means present mean values of the statements used for testing the influence of the technology anxiety on the acceptance of retail innovations.

According to data presented in Table 8, mean values for Taiwan related to technology anxiety are higher than mean values for Sweden. According to this the technology discomfort is higher for Taiwan than Sweden. T-test has been used for testing is this difference in the technology discomfort level among the two groups significant.

Table 9 presents Group Statistics for t-test between Sweden and Taiwan, where tested variable is technology anxiety. Mean of technology discomfort for Taiwan is 2.50 and for Sweden is 1.71. Table 10 comments on the level of significant between these two countries.

Table 9

Overview of the group statistics for technology anxiety influence

Country	Variable	N	Mean	SD
Sweden	Technology discomfort	33	1.715	0.6016
Taiwan	Technology discomfort	40	2.497	0.5631

Note. Mean value, standard deviation value and standard error mean between groups of Taiwan and Sweden for tested variable technology anxiety are obtained. They are used for testing is there any significant difference among two countries.

Independent sample test has been performed to test the significant level of the mean differences. Levene's Test for Equality of Variances has significant level p= .957, that is higher than 0.05, thus it can conclude that there is no significant difference between variances of

Sweden and Taiwan. Therefore t-test for equality of means with equal variances not assumed will be used.

The hypotheses used for t- test are as following:

H_0: $\mu_{Taiwan} = \mu_{Sweden}$

H_1: $\mu_{Taiwan} \neq \mu_{Sweden}$

T-test for equality of means with p value of 0, that is smaller than 0.05 (<0.05) leads us to rejection of null hypothesis. Therefore we can conclude that with 95% of confidence mean of technology discomfort of Taiwanese students is significantly higher than the mean of technology discomfort of Swedish students.

Table 10

Overview of the results of independent sample test for technology discomfort influence

	T-test for equality of means				
Variable	t	df	Sig. (2 tailed)	Mean difference	Standard error difference
Technology discomfort	-5.691	66.48	0.0	-0.7823	0.1374

Note. Independent sample test is used for testing if there is significant difference among means for technology discomfort for groups of Taiwan and Sweden. With significant level of p=0, it can be concluded that there is significant difference among means for technology discomfort between the two tested groups.

According to presented results it can be concluded that there is difference between the influence of technology anxiety on the acceptance of retail innovations between Taiwanese and Swedish. Thus, this leads to acceptance of the H_{3a} and H_{3b} of this research:

H_{3a}: Given a high level of uncertainty avoidance, Taiwanese consumers have a higher level of technology anxiety which will negatively effects retail innovation acceptance in comparison with Swedish consumers

H_{3b}: Given a low level of uncertainty avoidance, Swedish consumers have a lower level of technology anxiety which positively effects retail innovation acceptance in comparison with Taiwanese consumers.

Technology anxiety is influenced by high/low uncertainty avoidance culture. It can be concluded that low uncertainty avoidance influences the lower technology anxiety. According to the results of this research lower the uncertainty avoidance is lower the level of acceptance of retail innovations is. And opposite, high uncertainty avoidance culture influences higher level of technology anxiety. According to the results of this research lower the technology anxiety is higher the acceptance of retail innovations is.

According to data presented in Table 8, the highest difference in the technology anxiety between Taiwanese and Swedish respondents is related to the statement: "When given the opportunity to use technology, I fear I might damage it in some way." While the average difference between means of technology anxiety between these two groups is 0.78, the difference of means for this statement is 1.35. This is a very important managerial implication. To decrease the negative effect of high uncertainty avoidance and high level of technology anxiety on the acceptance of retail innovations, retailers should provide an education and educational materials to consumers before implementation of retail innovations. This will decrease consumers' sense of scare that the technology could be damaged in any way.

4.3. The relationship between cultural dimensions and attitude toward retail innovation types

The following section will analyze the influence of cultural dimensions on the consumers' attitude toward five different types of retail innovations. This section is used for testing the second group of hypothesis, including H_{4a} and H_{4b}. As presented on *Figure 7.* Research Framework – part 2, this research study the influence of collectivistic/individualistic, high/low uncertainty avoidance cultures on the consumer attitude toward different retail innovation types through social pressure, self-efficacy and technology anxiety. The results of this section are very important for business purposes and retailers. While the results of the first section of analysis chapter present the influence of cultural dimensions on the acceptance of retail innovations and give suggestions how some of the barriers can be overcame, this part present attitude toward different innovations. This will give a clear picture for retailers which retail innovations are more appropriate for different cultural environments.

Multiattribute model is used for testing the attitude of Taiwanese and Swedish toward different innovation types. Multiattribute model is based on the notion that customers see a retailer, a product, or a channel as a collection of attributes or characteristics. This model is design to predict the importance of attributes or characteristics to consumers and their beliefs that retailer, product or a channel possesses those attributes (Levy & Weitz, 2012). In the case of this research, respondents were asked to rank the importance of following retail innovation attributes/characteristics:

- People that are important to me should approve me to use a retail innovation;
- Society has already adapted and approved retail innovations;
- Retail innovation is similar to previous generation of retail innovations;

- I have already experience the retail innovation (including I saw other using it, I read about it or I used it by myself);

- Technological retail innovation is easy to use, with low level of self service and atomization;

- Retail innovation is not easy to be destroyed or damaged.

Every of the six statements relate to cultural dimensions of collectivistic/individualist and low/high uncertainty avoidance cultures through social pressure, self-efficacy and technology discomfort.

Once respondents have ranged their importance of every characteristic on the seven point scale, they were asked to rank on five point scale their beliefs how relevant every of the statements are for every of five retail innovations:

- Personal shopping assistant;

- Self-scan checkout;

- Intelligent Weighting Scale;

- Electronic Price Tags;

- Digital Advertising Display.

Overall evaluation of every of the retail innovations is calculated as the sum of importance weights multiply by performance beliefs (Lewy & Weitz, 2012). Thus, the evaluation is performed in the ways that first are calculated weights of the importance of every characteristic from all respondents from one group (Taiwan or Sweden). Secondly are calculated the weights of respondents' beliefs how relevant every of the statements are for every of five retail innovations. These numbers were multiply for obtaining an overall evaluation of each retail innovation.

4.3.1. The relationship between Taiwanese culture and attitude toward retail innovation types

The results of weighted importance and weighted average beliefs for Taiwanese respondents are presented in Table 11.

Table 11

Evaluation of retail innovations by Taiwanese respondents – importance and beliefs

Characteristic/Attribute	Weighted Importance	Performance Beliefs				
		Personal Shopping Assistant	Self-scan checkout	Intelligent Weighting Scale	Electronic Price Tags	Digital Advertising Display
People that are important to me should approve me to use a retail innovation	4.33	3.38	3.15	2.93	3.28	3.20
Society has already adapted and approved a retail innovations	4.53	3.08	3.03	3.23	3.50	3.92
Retail innovation is similar to previous generation of retail innovations	3.63	2.38	2.70	3.13	3.25	3.38
I have already experience the retail innovation (including I saw other using it, I read about it or I used it by myself)	4.05	2.28	2.78	2.93	2.93	3.83
Technological retail innovation is easy to use, with low level of self service and atomization	5.18	3.33	3.30	3.28	3.65	3.65
Retail innovation is not easy to be destroyed/damaged	4.05	2.85	3.25	3.18	3.50	3.28

Note. Respondents have ranked importance of every of six characteristics/attributes on the seven point scale. One (1) means "totally disagree" and seven (7) means totally agree. Relevance of every of these characteristics to each of five retail innovations have been ranked on five point scale. One (1) means "totally disagree" and five (5) means totally agree.

Weighted importance and performance beliefs for each retail innovation have been computed. Higher the overall evaluation is higher the consumer attitude toward an innovation type is. Overall evaluation of retail innovations by Taiwanese respondents is presented in Table 12.

Table 12

Overall evaluation of retail innovations by Taiwanese respondents

Retail Innovation Types	Overall Evaluation
	∑ (Importance x Belief)
Personal Shopping Assistant	75.1
Self-scan checkout	78.6
Intelligent Weighting Scale	80.2
Electronic Price Tags	86.7
Digital Advertising Display	91.5

Note. Overall evaluation is calculated as sum of importance weights multiply by performance beliefs. Higher the overall evaluation score is higher the consumer attitude toward an innovation type is.

According to the results of the multi-attribute model presented in Table 12, Taiwanese scored the digital advertising displays with the highest score 91.5. As a result, their attitude toward usage of digital advertising displays is the highest among the rest of the retail innovations. The lowest score from Taiwanese have received personal shopping assistant. Thus, Taiwanese attitude toward usage of personal shopping assistant is the lowest in comparison with the other four types of retail innovations.

Results of multiattirbute model presented in Table 12, support the H_{4a} of this research:

- H_{4a}: Given a Taiwanese collectivistic and high uncertainty avoidance culture, consumers prefer retail innovations with lower level of self-service and lower level of technology development (The highest preference is for Digital Advertising Displays, followed by Electronic price tags, Intelligent Weighing Scale, Self-scan Checkouts, Personal Shopping Assistant);

As shown in Table 12, Taiwanese scored retail innovations with lower level of self-service and lower level of technology development with the highest scores:

- Digital Advertising Display - 91.5;
- Electronic Price Tags - 86.7;
- Intelligent Weighting Scale - 80.2;
- Self-scan checkout - 78.6;
- Personal Shopping Assistant - 75.1.

4.3.2. The relationship between Swedish culture and attitude toward retail innovation types

The results of weighted importance and weighted average beliefs for Swedish respondents are presented in Table 13. They are used for computation of multiattribute model of overall evaluation of retail innovations.

Table 13

Evaluation of retail innovations by Swedish respondents – importance and beliefs

Characteristic/Attribute	Weighted Importance	Performance Beliefs				
		Personal Shopping Assistant	Self-scan checkout	Intelligent Weighting Scale	Electronic Price Tags	Digital Advertising Display
People that are important to me should approve me to use a retail innovation	3.09	3.36	3.30	2.91	2.70	2.42
Society has already adapted and approved a retail innovations	3.94	3.76	3.58	3.55	3.12	2.88
Retail innovation is similar to previous generation of retail innovations	3.24	3.52	3.15	3.12	2.79	2.55
I have already experience the retail innovation (including I saw other using it, I read about it or I used it by myself)	4.64	4.48	4.27	4.21	3.48	3.36
Technological retail innovation is easy to use, with low level of self service and atomization	4.64	3.94	4.03	3.76	3.45	3.48
Retail innovation is not easy to be destroyed/damaged	4.76	3.76	3.76	3.88	3.42	3.45

Note. Respondents have ranked importance of every of six characteristics/attributes on the seven point scale. One (1) means "totally disagree" and seven (7) means totally agree. Relevance of every of these characteristics to each of five retail innovations have been ranked on five point scale. One (1) means "totally disagree" and five (5) means totally agree.

Weighted importance and performance beliefs for each retail innovation have been computed. Higher the overall evaluation is higher the consumer attitude toward an innovation type is. Overall evaluation of retail innovations by Swedish respondents is presented in Table 14.

Table 14

Overall evaluation of retail innovations by Swedish respondents

Retail Innovation Type	Overall Evaluation
	∑ (Importance x Belief)
Personal Shopping Assistant	93.54
Self-scan checkout	90.90
Intelligent Weighting Scale	88.49
Electronic Price Tags	78.14
Digital Advertising Display	75.28

Note. Overall evaluation is calculated as sum of importance weights multiply by performance beliefs. Higher the overall evaluation score is higher the consumer attitude toward an innovation type is.

According to results of multi-attribute model presented in Table 14, Swedish respondents scored the personal shipping assistant with the highest score 93.5. As a result, their attitude toward usage of personal shopping assistant is the highest compared to the rest of the retail innovations. The lowest score from Swedish respondents has received digital advertising display. Thus, Swedish attitude toward usage of digital advertising display is the lowest in comparison with the other four types of retail innovations.

Results of multi-attribute model presented in Table 14, support the H_{4b} of this research:

- H_{4b}: Given a Swedish individualistic and low uncertainty avoidance culture, consumers will prefer retail innovations with higher level of self-service and higher level of technology development (The highest preference is for Personal Shopping Assistant, followed by Self-scan Checkouts, Intelligent Weighing Scale, Electronic price tags, Digital Advertising Displays).

As shown in Table 14, Swedish respondents score retail innovations with higher level of self-service and higher level of technology development with the highest scores:

- Personal Shopping Assistant - 93.54;
- Self-scan checkout - 90.90;
- Intelligent Weighting Scale - 88.49;
- Electronic Price Tags - 78.14;
- Digital Advertising Display - 75.28.

4.4. Summary of hypotheses test results

Hypothesis of this research are separated into two parts. The first part is used for testing the influence of cultural dimensions on the acceptance of retail innovations. While the second part is used for testing attitude of two cultural groups toward five different innovation types.

Independent t-test performed in SSPS program is used for testing the first group of hypothesis. Multi-attribute model is used for testing the second group of the hypothesis. The results of analysis show that all hypothesis of this research are supported and accepted. An overview of hypothesis testing results is presented in Table 15.

Table 15

Overview of hypothesis testing results

Hypothesis		Research Results
H_{1a}	Given a Taiwanese collectivistic culture, consumers will experience higher levels of social pressure which negatively effects retail innovation acceptance in comparison to the Swedish consumers;	Supported
H_{1b}	Given a Swedish individualistic culture, consumers will experience lower levels of social pressure which positively effects retail innovation acceptance in comparison to the Taiwanese consumers;	Supported
H_{2a}	Given a high level of uncertainty avoidance, Taiwanese consumers show a low level of self-efficacy which negatively effects retail innovation acceptance in comparison to the Swedish consumers;	Supported
H_{2b}	Given a low level of uncertainty avoidance, Swedish consumers will have a higher level of self-efficacy which positively effects retail innovations acceptance in comparison with Taiwanese consumers ;	Supported
H_{3a}	Given a high level of uncertainty avoidance, Taiwanese consumers have a higher level of technology anxiety which will negatively effects retail innovation acceptance in comparison with Swedish consumers;	Supported
H_{3b}	Given a low level of uncertainty avoidance, Swedish consumers have a lower level of technology anxiety which positively effects retail innovation acceptance in comparison with Taiwanese consumers;	Supported
H_{4a}	Given a Taiwanese collectivistic and high uncertainty avoidance culture, consumers will prefer retail innovations with lower level of self-service and lower level of technology development;	Supported
H_{4b}	Given a Swedish individualistic and low uncertainty avoidance culture, consumers will prefer retail innovations with higher level of self-service and higher level of technology development;	Supported

Note. Research hypothesis of this research are based on a literature review. Through research methodology they have been tested. Overall analysis of the hypothesis testing show that all the hypothesis of this research are accepted and supported. They show that collectivistic/individualist and high/low uncertainty avoidance culture through social pressure, self-efficacy and technology discomfort are relate to acceptance of retail innovations.

V. Conclusion and discussion

This last chapter of this Master Thesis will introduce final thoughts and discussions. This chapter consists of three parts. First are presented conclusions of the research and its managerial implications in the business world. They are followed by research limitation. The last section of this research will cover future research suggestions related to this topic.

5.1. Research conclusions and managerial implications

This study has a number of important implications for understanding and dealing when retail innovations are about to be implemented in retail stores. World is getting globalized and huge numbers of retailers are doing their business in multicultural environments, but their consumers are not uniformed. Cultural dimensions of collectivistic/individualist culture and high/low uncertainty avoidance culture influence the acceptance of retail innovations through factors as social pressure, self-efficacy and technology anxiety.

Collectivistic culture influence higher level of social pressure. Thus it results will lower level of retail technology acceptance. Individualistic culture has the opposite effect. High uncertainty avoidance culture results will low level of self-efficacy and high level of technology anxiety. This influences lower level of retail technology acceptance. Low uncertainty avoidance culture has the opposite effect.

The results of this research show that customers from Taiwan and Sweden should be addressed in different ways when it comes to implementation of retail innovations. Retailers should take in account differences among cultures once planning to offer retail innovations. Taiwanese customers should be offered at first with technological innovations with lower level of self-service and lower level of technological development as digital advertising displays. While

Swedish customers should be approach with high advanced innovations with high level of self-service such as personal shopping assistant.

Data shows that Taiwanese customers should be approach by education materials and demonstration before implementation of in store innovations. This will decrease their technology anxiety and increase their self-efficacy level. Thus they will be able to adapt technology with low level of rejection.

5.2. Research limitations and future research suggestions

The research results should be interpreted with caution due to few reasons. First, respondents did not have a change to judge about retail innovations after they have actually seen and used them. They have judged the retail innovations according to presented pictures and written explanation about its functions not based on an actual encounter with the innovations. Therefore it is possible that consumers have not received real feelings about usage of the each retail innovation. Secondly, the number of respondents is limited, as it represents opinion of forty (40) respondents from Taiwan and thirty tree (33) respondents from Sweden. Respondents are coming from specific social group – students. Thirdly, the research includes only two cultures – Sweden and Taiwan. These two counties are opposite to each other with respect to collectivistic and uncertainty avoidance cultural dimensions. Therefore, results should be applied with caution as generalization to other cultural groups.

Future research should enlarge the number of respondents to be able to get better insights by analyzing larger group of respondents. In addition it is recommended that the number of analyzed counties to be enlarged. This will allow to understand how different levels of collectivistic and uncertainty avoidance culture influence the acceptance of retail innovations.

Thus it will be possible to conduct generalization statements about influence of cultural dimensions on acceptance of retail innovations. More factors, apart from social-pressure, self-efficacy and technology anxiety to be included.

REFERENCES

Bandura, A. (1977). Self-efficacy toward a unifying theory of behavioral changes. *Psychological Review,* Vol.84, No.2, pp.101-215.

Curran, J. M., Meuter, M. L., & Surprenant, C. F. (2003). Intention to use self-service technologies: a confluence of multiple attitudes. *Journal of Service Research,*Vol. 5, No. 3, pp. 208 – 224.

Davis, F.D., Bagozzi, R.P., Warsaw, P.R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, Vol. 35, No. 8

Erumban, A. A., & Jong, S. B. (2006). Cross-country differences in ICT adoption: A consequence of Culture. *Journal of World Business*, No. 41, pp. 302-214.

Fishbein, M., & Ajzen, I. (1975). *Belied, attitude, intention and behavior: an introduction to theory and research,* Addison-Wesley, Reading, MA

Hofstede, G. (1980). *Culture's consequences: international differences in work-related values*, Sage Publication, Bevery Hills, CA

Hofstede, G (2013). *What about Taiwan?*(2013, January 2). Retrieved from http://geert-hofstede.com/taiwan.html

Hofstede, G (2013). *What about Sweden?*(2013, January 2). Retrieved from http://geert-hofstede.com/sweden.html

Igbaria, M., & Parasuram, S. (1989). A path analytic study of individual characteristics, computer anxiety and attitudes toward microcomputers. *Journal of Management*, September, Vol. 15, No. 3, pp. 373-388.

Institute for information industry, Inovative DigiTech-Enabled Applications & Services Institute, IDEAS(2012), Institute for information industry Taiwan

Kalyanam, K., Rajiv, L. & Wolfram, G. (2005). Future Store Technologies and their Impact on Grocery Retailing. *Retailing in the 21st Century: Current and Future Trends*, Manfreed Kraft and Murali Mantrala. (Eds), Springer, 95-112

Kelly, P., Lawlor, J., & Mulvey, M. (2010). A review of key factors affecting consumers' adoption and usage of self-service technologies in tourism. *THRIC Conference*, Shannon, Ireland, 15-16 June, 2010.

Levy, M., & Weitz, B. A. (2012). *Introduction to the world of retailing*. New York, NY: The McGraw-Hill Companies

Lim, K. H., Leung, K., Sia, C. L., & Lee, M. K. (2004). Is eCommerce boundary-less? Effects of individualism–collectivism and uncertainty avoidance on Internet shopping. *Journal of International Business Studies*, Vol. 35, pp. 545–559.

McGrath, R. G., & MacMilan, I. C. (1992). Elitists, risk-takers, and rugged individualists? An exploratory analysis of cultural differences between entrepreneurs and non-entrepreneurs. *Journal of Business Venturing*, Vol. 7, Issue 2, pp. 115-135.

Meuter, M. L. , Ostrom, A. L., Roundtree, R. I., & Bitner, M. J. (2000). Self-service technologies: understanding customer satisfaction with technology-based service encounters. *Journal of Marketing*, Vol. 64, No. 3, pp. 50-64.

Nakata, C., & Sivakumar, K. (2001). Instituting the marketing concept in a multinational setting: the role of national culture. *Journal of the Academy of Marketing Science*, Vol. 29, No. 3, pp. 255-275.

Schepers, J., & Wetzels, M. (2007). A meta-analysis of the technology acceptance model: Investigating subjective norm and moderation effects. *Information & Management*, Vol. 44, pp. 90–103.

Schliewe, J., & Pezoldt, K. (2010). A cross – cultural comparison of factors influencing self – scan checkout use. *Journal of Business & Economics Research*, Vol. 8, Number 8, pp. 39 – 47.

Steenkamp, J. B. E. M., Hofstede, F., & Wedel, M. (1999). A cross-national investigation into the individual and national cultural antecedents of consumer innovativeness. *Journal of Marketing*, Vol. 63, pp. 55-69.

Swar, B., Kim, J., Lee, D. H., & Moon, J. (2009). Impact of culture on mobile phone service adoption and diffusion: a cross-country analysis. *Computer Sciences and Convergence Information Technology*, 2009, pp. 1442-1444.

Yaveroglu, I.S., & Donthy, N. (2002). Cultural influences on the diffusion of products. *Journal of International Consumer Marketing*, Vol. 14, No. 4, pp. 49-63.

Yeniyurt, S. & Townsend, J. D. (2003). Does culture explain acceptance of new products in a country. *International Marketing Review*. Vol. 20, No.4, pp. 377-397.

Zeithaml, V. A., & Gilly, M. C. (1987). Characteristics affecting the acceptance of retailing technologies: a comparison of elderly and nonelderly consumers. *Journal of Retailing*. Vol. 63, No. 1, pp. 49 – 68.

Zhang, J., Beatty, S. E., & Walsh, G. (2008). Review and future directions of cross-cultural consumer service research. *Journal of Business Research*. No. 61, pp. 211-224.

APPENDIX 1

Pre-survey questionnaire

Dear Sir/Madam,

Thank you for your interest in participation in an academic research. The purpose of this questionnaire is obtaining consumer information for further analysis within a student final report for Retailing class at National Chiao Tung University. The title of the report *is Role of Cultural Dimensions in Self-Scan Checkout Acceptance*.

Self-scan checkouts are an example of an innovative self-service technology. They are checkouts where customers scan the barcodes of their products, pay for the products and put them into bags on their own, without the help of service employees (Schliewe & Pezoldt, 2010). An example of self-scan checkouts is presented on Picture 1.

Picture 1

Example of self-scan checkouts

Source: (Institute for information industry, Innovative DigiTech-Enabled Applications & Services Institute, IDEAS, 2012)

Questions from 1 to 19, please score every question from I totally agree to I totally disagree. For every question apply only one answer.

	Strongly agree	Agree	Uncertain	Disagree	Strongly Disagree
The people who are important to me would think I should use self-scan checkouts.					
It is expected that people like me would use self-scan checkouts					
People I look up to would expect me to use self-scan checkouts					
Most people who are important to me would approve of using self-scan checkouts					
The people who are important to me would agree that using self-scan is a good thing					
I could use Self-scan checkouts without the help of others					
I am unconfident that I can learn technology-related skills					
I could use self-scan checkouts if I had never used them before					
I have difficulty understanding most technological matters					
I could use self-scan checkout if I could call someone for help if I got stuck					
I feel apprehensive about using technology					
I could use self-scan checkouts if no one showed me how					

to do it first					
Technological terminology sounds like confusing jargon to me					
I could use self-scan checkout on my own					
I hesitate to use technology for fear of making mistakes I cannot correct					
I could use self-scan checkout if I had seen someone else using them before					
I have avoided technology because it is unfamiliar to me					
I am not able to keep up with important technological advances					
When given the opportunity to use technology, I fear I might damage it in some way					

Question 19

Gender:

a)Male

b) Female

Question 20

Field of study:

a) Technology related

b) Others

Question 21

Age:

a) 17 – 20

b) 21 – 25

c) 26 – 30

d) 31 and more

Thank You!

APPENDIX 2

Survey questionnaire - English

Dear Sir/Madam,

Thank you for your interest in participation in an academic research. The purpose of this research questionnaire is understanding students' attitude toward usage of retail innovations. Your answers will only be used as a part of an academic research and your personal data will be kept as a secret. Your answers are very valuable and important for this research. This research is a part of a Master Thesis process.

The title of the Master Thesis *is Role of Cultural Dimensions in the Acceptance of Retail Innovations.*

Thank you and kind regards,

Student: Elma Mulaomerovic

Advisor: Dr. Charles V. Trappey

National Chiao Tung University, Taiwan

*** If your nationality is Taiwanese or Swedish please continue with the questionnaire**

Introduction

Before you start answering the questionnaire, we would like to introduce you five retail innovations.

Picture 1

Personal Shopping Assistant (PSA)

PSA is a shopping basket equipped with a portable touch screen computer, UPS scanner, and wireless connectivity. The function of PSA is to lead the consumer trough the store, promotion, purchasing list and to assist to the consumer during the purchasing process. It also allow consumer to self-scan and pay for purchased products through RFID technology (Kalyanam, Lal, & Wolfram , 2010)

Source: Institute for information industry, Innovative DigiTech-Enabled Applications & Services Institute, IDEAS, 2012)

Picture 2

Self- scan checkouts

Self-scan checkouts are checkouts where customers scan the barcodes of their products, pay for the products and put them into bags on their own, without the help of service employees (Schliewe & Pezoldt, 2010).

Source: Institute for information industry, Innovative DigiTech-Enabled Applications & Services Institute, IDEAS, 2012

Picture 3

Intelligent Weighting Scale

Intelligent Weighing Scale allows consumers to weigh products, obtain a price and a bar-coded label. A critical characteristic of this weighting scale is that it recognized the product through its camera, so consumers do not need to indicate the product by themselves (Kalyanam, Lal, & Wolfram , 2010).

Source: Institute for information industry, Innovative DigiTech-Enabled Applications & Services Institute, IDEAS, 2012

Picture 4

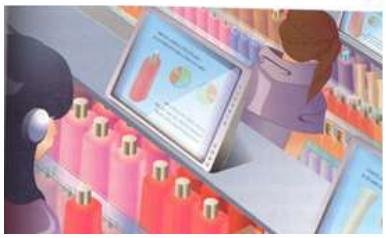
Electronic Price Tags

Electronic price tags are used for automatic change of price on shelves, that give an advantage to customers to know the exact price of the product that he will be charged. Thus, there are no unexpected price differences between the price shown on the shelf and the price charged on the cashier counter (Kalyanam, Lal, & Wolfram , 2010).

Source: Institute for information industry, Innovative DigiTech-Enabled Applications & Services Institute, IDEAS, 2012

Picture 5

Digital Advertising Display



Digital Advertising Displays consist of a flat screen display that shows interactive advertisements of products and promotions (Kalyanam, Lal, & Wolfram , 2010).

Source: Institute for information industry, Innovative DigiTech-Enabled Applications & Services Institute, IDEAS, 2012

Part 1

Questions from 1 to 19

Please score every question from I totally agree to I totally disagree. For every question only one answer is applicable.

	Strongly agree	Agree	Uncertain	Disagree	Strongly Disagree
1. The people who are important to me would think I should use retail innovations					
2. It is expected that people like me would use retail innovations					
3. People I look up to would expect me to use retail innovations					
4.Most people who are important to me would approve of using retail innovations					
5.The people who are important to me would agree that using retail innovations is a good thing					
6. I could use retail innovations without the help of others					
7. I could use retail innovations if I had never used them before					
8. I could use retail innovations if I could call someone for help if I got stuck					
9. I could use retail innovations if no one showed me how to do it first					
10. I could use retail innovations on my own					
11. I could use retail innovations if I had seen someone else using them before					
12. I have difficulty understanding most technological matters					
13. Technological terminology sounds like confusing jargon to me					

14. I am unconfident that I can learn technology-related skills					
15. I hesitate to use technology for fear of making mistakes I cannot correct					
16. I feel apprehensive about using technology					
17. I have avoided technology because it is unfamiliar to me					
18. I am not able to keep up with important technological advances					
19. When given the opportunity to use technology, I fear I might damage it in some way					

Source: Based on and adapted from a cross cultural survey designed by Schliewe & Pezoldt (2010)

Part 2

Importance of every of listed statement in **questions 20 – 25**, please score from 1 to 7. Where 1 is the lowest importance and 7 is the highest importance. One statement can receive only one score.

Statement	Importance of the statement from 1 to 7						
	1	2	3	4	5	6	7
20. People that are important to me should approve me to use a retail innovation							
21. Society has already adapted and approved a retail innovations							
22. Retail innovation is similar to previous generation of retail innovations							
23. I have already experience the retail innovation (including I saw other using it, I read about it or I used it by myself)							
24. Technological retail innovation is easy to use, with low level of self service and atomization							
25. Retail innovation is not easy to be destroyed/damaged							

Your beliefs that these statements apply to every of five retail innovations in **questions 26 – 31**, please score from 1 to 5. Where 1 is the lowest belief and 5 is the highest belief that a statement apply to a particular innovation. One statement can receive only one score.

	Statement from question number:	Beliefs that statement apply to an innovation (score from 1 to 5)				
		Personal shopping assistant (Picture 1)	**Self-scan checkout (Picture 2)**	**Intelligent Weighting Scale (Picture 3)**	**Electronic Price Tags (Picture 4)**	**Digital Advertising Display (Picture 5)**
26	Q20					
27	Q21					
28	Q22					
29	Q23					
30	Q24					
31	Q25					

Part 3

32. Gender: a) Male b) Female

33. Age: a) 17 – 20 b) 21 – 25 c) 26 – 30 d) 31 and more

34. Field of study: a) Technology related b) Others

35. Nationality: a) Taiwan b) Sweden c) Others

Thank You for Your Participation

* In case of any questions, please feel free to contact us via e-mail: elma.ramic@gmail.com

APPENDIX 3

Survey questionnaire - Chinese

親愛的先生/女士，

謝謝你對於參加學術研究的興趣。此研究調查表的目的在於瞭解學生對於使用零售創新的態度。您的答案將僅用於作為學術研究的一部分，您的個人資料將得到保護。您的答案對於這項研究是非常寶貴和重要的。這項研究是碩士學位論文過程的一部分。

碩士論文的標題 "*文化尺度在零售創新接受扮演的角色*".

感謝你親切的協助，

學生： Elma Mulaomerovic

指導教授： Dr. Charles V. Trappey

台灣國立交通大學

*** 如果你的國籍是臺灣或瑞典請繼續調查問卷**

簡介

你在開始回答問卷之前，我們想向您介紹五個零售創新。

圖片 1

個人購物助手（PSA）

PSA 是一種購物籃配有可携式觸控式螢幕電腦、 UPS 掃描器和無線連接。PSA
的功能是帶領消費者在購買的過程中協助於整個店區的促銷、採購清單。它還允許消費者可以藉由RFID 技術,
自己做掃描和支付購買產品的動作（Kalyanam，拉爾和鎢，2010年)

資料來源：財團法人資訊工業策進會創新應用服務研究所 (2012 年)

圖片 2

自助掃描方式結帳

自我掃描方式結帳是由客戶自己掃描其購
買商品的條碼、
付帳並放進自己購物袋而不經過商店員工的服務 (Schliewe & Pezoldt，2010年) 。

資料來源：財團法人資訊工業策進會創新應用服務研究所 (2012 年)

圖片 3

智慧秤重

智慧秤重方式允許消費者藉由商品秤重，獲取價格和條碼的標籤。這種秤重方式的關鍵特徵是必須藉由相機鏡頭做影像辨識，所以消費者不需要指名產品本身（Kalyanam、拉爾及鎢，2010年）。

資料來源：財團法人資訊工業策進會創新應用服務研究所 (2012 年)

圖片 4

電子價格標籤

電子價格標籤用於自動改變架上商品價格，這給客戶確切了解商品將被收取的價格。因此購物者不會期待有架上所示的價格和出納櫃檯收取價格發生差異。

資料來源：財團法人資訊工業策進會創新應用服務研究所 (2012 年)

圖片 5

數位廣告顯示

數位廣告顯示是由平面螢幕顯示商品互動廣告以及促銷活動(Kalyanam、 拉爾，& 鎢，2010年)。

*資料來源：財團法人資訊工業策進會創新應用服務研究所 (2012 年)***第 1 部分**

1 到 19 的問題

請從我的每個問題回答,答案區分為"完全同意"到"完全不同意"五個等級。

每個問題只有一個答案是適用的。

	強烈同意	同意	不確定	不同意	強烈反對
1. 是對我重要的人會認為我應該使用零售創新					
2. 預期像我這樣的人會使用零售創新					
3. 我尊敬的人會期望我使用零售創新					
4 大多數對我很重要的人贊成使用零售創新					
5.對我重要的人同意使用零售創新是一件好事					
6. 可以使用零售創新不須別人的幫助					
7. 我可以使用零售創新就算之前沒使用過					
8. 我可以使用零售創新如果使用遭遇困難中可以打電話求助					
9. 如果沒有人教我如何做它第一次，我可以使用零售創新					
10. 我可以自己使用零售創新					
11. 我可以使用零售創新在觀察他人使用之後					
12. 我難以理解大多數技術事項					
13. 對我來說,技術術語聽起來像是胡言亂語					
14 我對於學技術相關的技能沒有信心					
15 我猶豫使用技術因為擔心犯無法更正的錯誤					
16 我覺得擔心使用技術					
17. 我避免使用技術因為我不熟悉					
18 我不能跟上重要的技術進步					

19 當得到要使用技術的機會，我擔心我可能會以某種方式損壞它					

資料來源： 基於和適應了從跨文化調查設計的 Schliewe & Pezoldt （2010 年）

第 2 部分

請回答**問題 20 — 25**中每個敘述的重要性，分數從 1 到 7。其中 1 是最低的重要性，7 是最高的重要性。一個問題可以只有一個分數。

敘述	從 1 到 7 的發言的重要性						
	1	2	3	4	5	6	7
20. 對我很重要的人應該允許我使用零售創新							
21 社會已經適應並允許使用零售創新							
22. 零售創新是類似於上一代的零售創新							
23. 我已經有經歷零售創新 (包括我看見他人使用，我讀到它或自己使用)							
24. 技術的零售創新很容易使用，包含低階的的自助服務和自動化							
25. 零售創新是不容易被破壞損壞							

你對於每個零售創新的信念，適用於**問題 26-31**，分數從 1 到 5。其中 1 是最低的信念，5 是最高的信念, 敘述適用於個別的創新。一個問題可以只有一個分數。

	號問題的敘述：	聲明對創新適用的信仰（從 1 到 5 的分數)				
		個人購物助理 (圖片 1)	**自助掃描結帳（圖片 2）**	**智慧秤重方式 (圖片 3)**	**電子價格標籤 (圖 4)**	**數位廣告顯示 (圖 5)**
26	Q20					
27	Q21					
28	Q22					
29	Q23					
30	Q24.					
31	Q25					

第 3 部分

32. 性別： a) 男性 b）女性

33. 年齡： a) 17 - 20 b) 21 - 25 c) 26 - 30 d) 31 和更多

34. 研究領域： a) 技術相關 b）其他

35. 國籍： a)瑞典 b)台灣 c)其他

謝謝您的參與

* 在的情況下任何問題，請隨時通過電子郵件與我們聯絡： elma.ramic@gmail.com

APPENDIX 4

Curriculum vitae

SUMMARY OF QUALIFICATIONS

- Three years' experience in international marketing positions;
- Educated in five countries, participated in International Summer Schools and P&G Management Springboard Seminar Budapest, Hungary;
- Master of Economics degree from Faculty of Business and Economics, Zagreb, Croatia;
- Educated, experienced and self-confident professional with good social communication and positive attitude, trusted team player;
- Delivering positive results while working with cross-department and multinational teams;
- Analytical with good understanding of people psychology and behavior;
- Open for new and different experiences;
- Skillful in recognizing trends, willing to take risk and oriented toward the future .

WORK EXPERIENCE

05/2009 – 01/2011 **Reckitt Benckiser, Zagreb, Croatia** (www.rb.com)

Position: Junior Brand Manager

Key achievements:

- Creating brand marketing strategies for Slovenia, Croatia, Serbia, B&H, Bulgaria, Monte Negro and Kosovo which resulted with constant market share increase;
- Managing local marketing key performance indicators (KPI) and effectiveness of activities;
- Reducing marketing budget for brand promotion activities up to 50% due to careful selection of partner marketing agencies;
- Coordinating marketing activities with Sales teams and increasing point of sales promotion up 5 promotions in every account per year;
- Sell-out analysis, Nielsen analysis that generated powerful knowhow and brand learning curve and are

used for future marketing and sales planning strategies;

- Adapting TV advertisement for seven markets, creating TV tags which increased sell out in every of seven countries.

07/2006 – 09/2008 **DHL Croatia, Zagreb, Croatia** (www.dhl.hr)

Position: Customer Enquiry Advisor

Key achievements:

- Preparing the most suitable logistics services resulted with 20% sales improvement on an year base;
- Solving and satisfying customers' problems and displeasures resulted with keeping the customers.

Award: Employee of the month 06/2007 – first part time employee that has ever been selected for this award

EDUCATION

09/2013 - **National Tsing Hua University, Hsinchu, Taiwan** (www.nthu.edu.tw)

Program: Department of Industrial Engineering and Engineering Management, PhD Program

Note: Accepted to the program from Fall 2013

09/2011 – **National Chiao Tung University, Hsinchu, Taiwan** (www.nctu.edu.tw)

Program: Global Master of Business Administration

Dean Award – The Best MBA student in 2012

Institute for Information Industry Taiwan Business Plan Competition – First Prize

Accepted to MakeLearn Conference 2013 (http://makelearn.issbs.si) as a paper co-author

GPA 93.41

09/2009 – 09/2010 **Faculty of Business and Economics, Zagreb, Croatia** (www.efzg.hr)

Program: Master of Economics field Trade

GPA 4.8 (A = 4.5 to 5)

09/2005 – 06/2009 **Faculty of Business and Economics, Zagreb, Croatia** (www.efzg.hr)

Program: Bachelor of Economics field Trade

GPA 4.7 (A = 4.5 to 5)

CAPABILITIES AND SKILLS

Bosnian / Croatian	Fluent	Mother language
Bulgarian	Fluent	Studying 10 years in Bulgaria and using it every day
English	Fluent	Studying 15 years and using it every day
German	Good	Studying in Germany for 6 months and 2 years in Croatia
Chinese	Good	Finished Practical Chinese I, II and III

- Advanced usage of Nielsen Market Shares Software - Nielsen Data Base Analysis Certificate from 05/2009
- Strong knowledge of usage of MS Office
- Good communicator – Soft Skills Certificate from 07/2006
- Capable organizer – experience in organizing students associations, companies team buildings, university team programs and non-profit organizations' activities

PERSONAL PREFERENCES

- Latino and Ballroom dancing – 12 years' experience in professional dancing with a lot of awards from domestic and international competitions
- Acting and theater – participating in students' theater groups, placing in the top ten actors out of 700 in live show program OBN TV Multi Talents Show, Sarajevo, Bosnia and Herzegovina
- Travelling and tourism – leading tourist groups in Sarajevo, B&H and Zagreb, Croatia in three languages Croatian, Bulgarian and English