Notre Dame University-Louaize
Faculty of Business Administration & Economics
Graduate Division

&

Bordeaux Management School
Institute of International Business

Consumer acceptance of NFC in City Mall

Submitted by: Rita Julien Merheb

Supervised by: Dr. Fawzi Baroud

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Approval Certificate

CONSUMER ACCEPTANCE OF NFC IN CITY MALL

BY

RITA JULIEN MERHEB

GRADE: B+

Approved by

Supervisor's Name and Signature: Dr. Fawzi Baroud

Reader's Name and Signature: Dr. Kamal Abou Chedid

Committee Chair Name and Signature: Dr. Viviane Naimy

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DECLARATION

I hereby declare that this Thesis is entirely my own work and that it has not been submitted as an exercise for a degree at any other University.

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Rita Julien Merheb

ABSTRACT

Purpose – Near Field Communication (NFC) is a new emerging technology with an approach to provide users with lots of new options with a simple, easy and fast way and which will make human life easier. This thesis aim to investigate the willingness of City Mall's customers to accept Near Field Communication (NFC) in the grocery store by exploring the key factors that affects their adoption decision. There are critical success factors that determine whether an adoption of such a technology will be in a successful matter.

Design/methodology/approach – The research used a questionnaire to examine the factors that will affect City Mall's customers to accept NFC in the grocery store. The results provided insights on the effect of gender, educational level and age on respondent' adoption decision.

Findings – Data analysis found no variation for gender on the new dimensions, and small variations for age and educational level.

Research limitations/implications – This research was performed using an opportunistic sampling technique which cannot be generalizable to a large population. In addition, a basic assumption was set to conduct this study where respondents were assumed to be honest with their answers.

Practical implications – This research could be expanded to include various supermarkets distributed across Lebanon. This can demonstrate if this study can be generalizable. In addition, studies could be performed to assess the impact of being married on the need for shopping and the need of using NFC in the supermarket.

Originality/value – This thesis hopes to enhance understanding of the different use and application of this new technology. A glut of research was conducted on NFC; however none of them included the Lebanese context. Therefore, this thesis intends to inform the public about the advantages and disadvantages of implementing it in a large grocery store in Lebanon.

Keywords – Near Field Communication, technology acceptance model, City Mall, user resistance or acceptance.

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LIST OF ABBREVIATIONS

All the abbreviations used in this thesis are placed here in an alphabetical order

IDT	Innovation Diffusion Theory
NFC	Near Field Communication
RFID	Radio Frequency Identification
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
SE	Security Element

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Last but not the least; I want to thank my family and friends for their company and support.

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Chapter 1. INTRODUCTION

This chapter is designed to discuss the background of the study which deals with the history of NFC and where it will be implemented. It will start with a general introduction to the topic. Then, the chapter will discuss the different use and modes of communication of NFC. Finally, the need, objectives and contribution to knowledge of this thesis will be elaborated. The chapter is structured as follows:

1. Background
2. Definition of terminologies
3. Context of the study
4. Need for the study
5. Objectives of the study
6. Research questions
7. Research hypothesis
8. Contribution to knowledge
9. International perspective/application
10. Thesis structure

1.1. Background

This section discusses the background of the project to a better understanding of NFC, its importance, where did it come from and how does it work.

Technically well advanced cell phones are nowadays emerging in our everyday lifestyles. They are becoming more powerful with the capabilities of performing tasks that were hard to imagine few years ago. These cell phones provide users with advanced interacting functions such as: multi-touch, location knowledge, global positioning system (GPS), maps and a host of other functions. Further, it offers users the possibility to choose and buy applications from application stores such as: educational, entertainment, games, books, financial, health, social networking etc. All the above features exist in almost all cell phones providing users with great opportunities and options.

Lately, a new technology is emerging called Near Field Communication (NFC). It is a short range wireless connection technology integrated in mobile phones that provides a simple, quick and safe communication between electronic devices. This communication occurs when two devices, which are NFC compatible, are brought four centimeters close to one another. The connection between NFC enabled mobiles could be established using wireless connections via internet and smart card readers. This technology is still in the beginning stages of adoption, but its acceptance will change the way users use their mobiles (Kazmi, 2011).

NFC technology started from Radio Frequency Identification (RFID) which is a microchip installed in a reader tag and has been around since 1990s. It has the same capabilities as the barcode or a magnetic strip and provides a unique identifier for objects. The basic structure of RFID technology is a machine called reader, for example a mobile phone, provides an RF field. The reader adjust the RF field in order to receive requests and transmit data to a tag which is an integrated circuit attached to an antenna (Syed & Ilyas, 2012).

NFC is based on the same technology of RFID; therefore, it is easy to confuse between them.

In 2003, NFC became an acceptable standard for the International Organization for Standardization (ISO) and for the Information Communication Technology and Consumer Electronics (ECMA). In addition, Sony, NXP Semiconductors and Nokia created the NFC forum in order to define standards on top of the ISO standards to guarantee maximum compatibility across all implementation of NFC technology (Lawrence, 2012). These definitions will be presented and discussed in the sections set forth.

1.2. Definition of Terminologies

This part defines the terminologies used in the present study. These are: NFC, Read/Write, Tag emulator, Peer-to-peer and modes of operations.

1.2.1. NFC Modes of Communication

This new technology provides its users with a wide range of features and functions using three modes of communication:

1.2.1.1. Read/ write mode

NFC mobiles can read or write to a tag. For example, read information, special offers and discounts from smart posters or billboards, save personal information that will allow the entrance to a secure building, store tickets on the cell phone to access transportation gates, parking garages or even attain events.

1.2.1.2. Tag emulator mode

NFC mobiles act like smart card. For example, make payments with a touch or a wave on any contactless reader.

1.2.1.3. Peer-to-peer mode

In per-to-peer mode, a link level communication is established between two NFC mobiles. For example, take a picture and transfer it to an NFC-enabled monitor or printer and share business cards with other NFC-enabled phones.

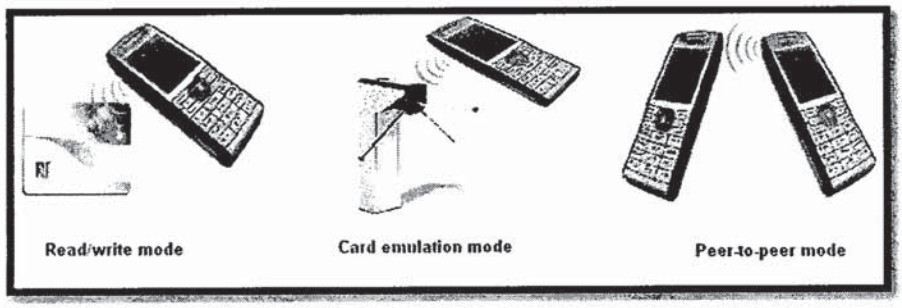

Figure 1: NFC Modes of Communication

Source: (Kazmi, 2011)

1.2.2. NFC Modes of Operation

The NFC protocol covered two modes of operation for NFC:

1.2.2.1. Active

In active mode, both devices generate radio field to transmit data. In this case, the initiator could be any of the devices and the other will be the target.

While communicating, the initiator launches the communication in a particular mode at an exact speed and the target finds the current speed and replies back to the initiator. The communication is terminated when one of the two devices moves out of the range of application.

1.2.2.2. Passive

In passive mode, only one device generate radio field to transfer data whereas the other one uses load modulation to transfer data.

This mode is very effective for battery-powered devices like mobile phones and PDA's since in this case the other device will generate radio field. Hence, the battery needed to generate radio field will be saved.

1.2.3. How NFC Works

NFC could be used in four different ways:

1.2.3.1. Phone to phone

Two phones equipped with NFC can communicate with each other and send data, files, pictures and music by just touching their phones with each other.

Figure 2: Phone to Phone NFC Transaction

Source: Ibid.

1.2.3.2. Phone to device

An NFC equipped device can communicate with any device in order to perform a transaction. For example, send an order to the printer to print a picture from the phone or perform a payment transaction by just touching a payment device.

Figure 3: Phone to Device NFC Transaction

Source: Ibid.

1.2.3.3. Phone to tag

Tags are normally embedded on posters for marketing purposes. They contain data and could be used in supermarkets on items to retrieve additional information about each product.

Figure 4: Phone to Tag NFC Transaction

Source: Ibid.

1.2.3.4. Phone to reader

Cell phones can communicate with an external reader by just touching it with reader and hence purchase and store electronic tickets in it.

Figure 5: Phone to Reader NFC Transaction

Source: Ibid.

1.2.4. NFC in Smartphone

Since NFC is a chip included in Smartphone, it is available on a limited number of platforms and models (NFC World, 2013).

1.2.4.1. iPhone

Almost all new Smartphone are including NFC into their devices, except for Apple which is the only major player in the Smartphone market that does not provide its customers with at least one model that have NFC technology. This is because apple thinks that this technology will not solve any current problems. In addition, Apple developed an application called "Passbook" which allows users to store loyalty cards, tickets and coupons in the cell phone. However, this application does not allow users to link their credit and debit card to their Smartphone.

1.2.4.2. Samsung

Many Samsung phones have integrated NFC chips into their devices. Such as: Samsung Galaxy Note II, Samsung Galaxy S Advance, Samsung Galaxy SIII, Samsung Galaxy SIII Mini and Samsung Galaxy Stratosphere II.

1.2.4.3. Blackberry

Same as Samsung phones, blackberry has many integrated NFC Smartphone. Such as: Blackberry Bold 9790, Blackberry Bold 9900/9930, Blackberry Curve 9350/9360/9370/9380 and Blackberry Z10.

1.2.4.4. Nokia

As for Nokia, many devices offer NFC capabilities. Such as: Nokia 603/700/701, Nokia 808 PureView, Nokia c7/Astound, Nokia Lumia 610 NFC, Nokia Lumia 620, Nokia Lumia 820, Nokia Lumia 920, Nokia N9 and Nokia Oro.

1.2.4.5. HTC

Same as Samsung, Blackberry and Nokia; HTC also has many NFC enables Smartphone. Such as: HTC Desire C, HTC Droid DNA/HTC J Butterfly, HTC Droid Incredible 4G LTE, HTC Evo 4G LTE, HTC First, HTC Incredible, HTC One SV, HTC One X/XL, HTC Ruby/Amaze 4G and HTC Windows Phone 8X.

1.2.4.6. Motorola

Below is a list of NFC enables Motorola devices: Motorola Droid Razr, Motorola MC75A HF, Motorola Photon Q 4G LTE and Motorola Razr i/MT788.

1.2.4.7. LG

LG has the following NFC enables devices: LG Optimus 3D Max, LG Optimus 4X HD, LG Optimus G, LG Optimus L5, LG Optimus L7, LG Optimus LTE, LG Optimus LTE Tag and LG Viper.

1.2.4.8. Sony

Finally, Sony Xperia also provides its customers with many NFC enables Smartphone. Such as: Sony Xperia Acro S, Sony Xperia P, Sony Xperia S, Sony Xperia Solam, Sony Xperia T, Sony Xperia V and Sony Xperia Z. Ibid.

NFC is an interesting technology that will make human life easier. Major players in the market are nowadays integrating it in their cell phones. NFC has lots of daily life applications which will provide it's users with four different ways of communication: Phone to phone, phone to device, phone to tag and phone to reader. Quick review of this section is presented in the Table 1 below.

Modes of communication	Usage model	Mode of operation
Read/Write mode	Phone to tag	Passive
	Phone to reader	Passive
Tag emulator mode	Phone to device	Passive
Peer-to-peer mode	Phone to phone	Active

Table 1: NFC modes of communication

The section that follows will discuss the context of the study.

1.3. Context of the Study

The starting premise of this study is the need to capitalize on information and communication technologies in buttressing the efficiency of business management and delivery. In fact, the rapid development in information and telecommunications technology is increasing the usage of multi-functional personal computers, growth in the internet usage and diversified means of telecommunication. Due to this rapid growth, organizations are capable now to improve their performance in almost every area such as, inventories, manufacturing, distribution, marketing and customer service (Bae, 2003).

Therefore, in order to survive in the knowledge economy, businesses have had to adapt quickly to new ways of conducting their day-to-day activities with innovations such as just-in-time service and delivery, e-commerce and the integration of computer technology into daily operations. Consequently, this thesis intends to investigate the consumer acceptance of mobile payments and the implementation of NFC in City Mall. These will be detailed in the objectives section of this chapter.

1.3.1. The Site

The site chosen for this study is City Mall situated in the Matn district of Mount-Lebanon Governorate. City Mall is literally a city containing everything you could possibly wish for. It is the largest commercial center in Lebanon which is located on the northern seaside outskirts of the capital. City Mall contains more than 150 retail boutiques, restaurants and cafés; the largest cinema complex in Lebanon, a play area for kids, department stores, a supermarket, ice skating and so much more which encourage visitors from all countries and of all ages to come back .

City Mall, with no doubt, is the place to visit at any time of the year. Whether it is Christmas time, Easter or Ramadan, you feel the sensations once you are in. It also transforms into the city of love on Valentine's Day and ensures that you will always remember both Mother's Day and Father's Day. Not forgetting the seasonal events that are held throughout the year to make you dive deep in the festive spirits. This is why Customers might prefer to shop at City Mall rather than other malls. Hence, investing in NFC, if customers are willing to use it, will increase the added value that City Mall has and therefore increase its profit.

The next section will present and discuss the supplementary use of NFC.

1.3.2. Supplementary use of NFC

As already stated above, there is lot of ways City Mall could benefit from NFC. Below you can find some of them: (Kazmi, 2011)

1.3.2.1. NFC parking application

The clients will get their cell phones close to an NFC tag which will open the parking entrance and start counting the duration of the stay. On leave, the same process will occur; the clients will pay the parking fees by just putting their cell phones close to the NFC tag and the gate will directly open.
This process will save the clients lots of time and decreases the queue in parking lots. Keeping in mind that City mall's cost will decrease since NFC systems reduce the cost of card issuance management.

1.3.2.2. NFC shopping application in TSC supermarket

The clients can touch the products' tag in order to get additional information like size, color, manufacturing date, expiry date, price, weight … In addition to that, they can add the products to the shopping card and at any time during the shopping they can know the total price.

Finally, the total amount can be paid through NFC phone and they can keep record of all their shopping receipts. This will allow the clients to make a comparison to their previous shopping, let alone that NFC will accelerate the checkout process.

1.3.2.3. NFC warehouse control

A tag "Out of stock" will be placed on the shelf of each category of items. This tag will be emulated by the clients if the shelf is empty. Once the client touches this tag through his cell phone, an "out of stock" indicator will be sent to the warehouse manager in order to refill the shelf.
This will help City mall to have a higher turnover of their stock.

1.3.2.4. NFC for venue reviews

All the restaurants in city mall will have NFC enabled stickers on the entrance which will allow the clients to rate the restaurant or read reviews by simply waving their Smartphone. In this way, City Mall's restaurants will be very transparent towards their clients since they can have an idea of the foods and services of each restaurant before entering. And that's how customers will be satisfied by having a better choice of the place they want to dine in.

1.3.2.5. NFC in CinemaCity at City Mall

CinemaCity movie posters will be smart posters where the clients can wave their Smartphone towards the poster to see the trailer of the movie they desire to watch, observe the available seats, buy tickets and store them on the phone. This will decrease the long waiting queue to buy cinema entry tickets and will eliminate any worry of losing or forgetting the tickets.

1.3.2.6. NFC marketing tool

City mall can add smart posters to impress their clients with new offers. These posters will have NFC tags. When the clients touch the poster through their cell phones, they will get additional information on the offer and the products.

The above points are options that could be implemented and used in City Mall. But the aim of this thesis is to study the user acceptance of using NFC in the grocery store in City Mall. The focus will be on two usages: NFC for payment and NFC for products information.

1.4. Need for the study

These days, we are living in a world which contains many difficulties and necessities that requires many concessions which force couples and individuals to work hard in order to fulfill their basic needs and attain financial stability. Therefore, time consumption is very critical and one of the big concern that people are facing, is the time needed to spend in supermarkets since they usually do not go for pleasure or to treat themselves, but to complete their needs of acquiring food, beverages, and other household requirements. Furthermore, many shoppers go to supermarkets between leaving work and going home and during their vacations wishing to spend the least time possible in a supermarket. However, due to the large amount of products the customers buy in a supermarket, the checkout process takes a lot of time compared to other stores since the cashier has to scan each item (Wiechert, Schaller, & Thiesse, 2012).

In response to this problem; many studies (e.g., (Wiechert T. J., Schaller, Thiesse, & Fleisch, 2008) have) shown that NFC applications would not change the customer shopping practice but simply support it and accelerate the checkout process.

Retailers are facing many challenges when it comes to the satisfaction of their clientele. One of them is the clients' high expectations to obtain the best quality of products and services provided within the shop. However, due to the high competition, retailers are forced to cut costs in every possible way in order to decrease prices. One of the means is by reducing the number of employees in the store which will negatively affect customers' satisfaction. Since the latter will barely find store representatives to assist them and if they do, these personnel might not have enough product knowledge.

NFC will solve this problem by giving the customers an option to find all the needed information about any product using their Smartphone with a simple click.

In addition to the checkout process problem and the lack of store representatives in the store; City Mall is facing a big problem in the CinemaCity floor where the clients have to wait in a long queue in order to reserve a seat.

However, City Mall already tried to find a solution by giving their clients the opportunity to reserve and pay online, but still the clients should wait in the queue to receive their tickets.

Since NFC has the possibility to read from smart posters and conduct payment transactions; City Mall can implement it in CinemaCity and allow its customers to download the trailer of the movie they desire to watch by waving their Smartphone near the movie smart poster and see the remaining available seats or even reserve and pay through their phones. In addition, they will be able to save the tickets on the phone without having to wait in the queue. Furthermore, this will eliminate any worry of losing or forgetting the tickets.

Besides the strategy of cutting off the number of employees in the grocery store to reduce cost; City Mall could benefit from the new NFC technology by implementing it in the parking and reduce the cost of card issuance. Furthermore, City Mall's clients will be able to gather parking information on their cell phones by just touching the phone to an NFC tag that gives them the parking duration and fees, as well as pay the parking fees directly from their smart phones without having to wait in a queue to pay.

1.5. Objectives of the study

The objectives of this thesis are:

- To assess the challenges of implementing NFC in City Mall
- Document the perceived benefits of using NFC in City Mall
- Determine the success factors and barriers of the implementation

The main purpose is to research and explore the key factors that affect the user acceptance of NFC and mobile payments. Therefore, the level of awareness of this technology will be studied. Moreover, the consumer interest in mobile payment

method along with the security issues associated with it will be taken into consideration since we are dealing with sensitive information.

1.6. Research Questions

In line with the above objectives, the study seeks to answer the following research question:

1. What are the respondents' views towards the implementation of NFC in the grocery store in City Mall?
2. What type of dimensions did the eclectic model produce as yielded from respondents' views?
3. What variations are found on the new dimensions according to age, gender and educational level variables?

1.7. Research Hypothesis

This thesis seeks to test the following alternative hypotheses:

H_1: Variables extracted from multiple technology theories employed in this study will yield new dimensions emerging from the Lebanese context.

H_2: Because of different value systems nourishing respondents' attitude to technology (Teo, 2010), variations on the new emerging dimensions will be found based on respondents' gender and educational level.

H_3: Since age appears to be a determinant in explaining attitudes to technology (Alharbi, 2012), it is hypothesized that age will explain variance in the new devised technology dimensions yielded from factor analysis.

1.8. Contribution to Knowledge

Backed by previous researches done on NFC, this thesis hopes to enhance understanding of the different use and application of this new technology. A glut of research was conducted on NFC; however none of them included the Lebanese context. Therefore, this thesis intends to inform the public about the advantages and disadvantages of implementing it in a large grocery store in Lebanon.

Furthermore, using the theories stated in the conceptual framework which will be discussed in chapter 2, this thesis examines the factors that will affect City Mall's customers whether to accept or reject the use of this technology.

In addition, since TAM was built on two variables (Perceived ease of use and perceived usefulness) without taking into consideration the individual differences that might affect consumers' acceptance of a new technology; this thesis intends to study and explore how the age, education and gender could affect the decision of adoption or rejection.

The section that follows will discuss the international supermarkets that have already implemented NFC in their stores.

1.9. International perspective/application

In October 2012; Casino "Les Belles Feuilles" branch in Paris opened the first NFC-enabled supermarket which will offer its customers an easier, faster and more enjoyable shopping experience. Shoppers will be able to:

1. Get details about any product such as: ingredients, product supplier, videos and pricing by scanning the shelf-edge labels that contains NFC tags.
2. Place the scanned items into a virtual shopping basket using the mCasino NFC application.
3. Store their loyalty cards and promotional offers in their Smartphone and personalize the application so that it reflects their preferences and buying habits.
4. At any time, the customers can know the total net of their shopping and add or remove items from their virtual shopping basket.

5. Finally, the checkout process will occur by tapping the Smartphone to an NFC reader attached to the cash register which will read all the information needed from the mobile. Then, the customer will pay by card, cash or through his cell phone.

After testing these options in "Les Belles Feuilles"; the service will be extended to Lyon which will consist of poster stores at out-of-home locations such as metro stations and bus shelters. Once the customers touch the posters, they will be able to add the items shown into their casino shopping basket. And then they can collect the items purchased from a local store or ask to be delivered to their home.

In addition to all of these innovative conventions, the casino will also introduce the "Casino Digital Wall" during the fourth quarter of 2012. This consists of a digital touch screen poster that shoppers can use to select products, view additional information about them and add them to their virtual shopping basket. (Clark, Casino to open world's first NFC-enabled supermarket, 2012)

Figure 6: Casino Digital Wall

Source: Ibid.

In addition to Casino "Les Belles Feuilles", many projects are heading towards using NFC. For example, Dubai roads and transport authority are planning to implement an NFC ticketing system across the Emirate's metro, bus and water bus services. This service will be launched in 2013 and is expected to be the first step towards NFC technology use in the Middle East (Ibid).

Furthermore, in order to speed up the payment process; McDonald's Ukraine selected Ingenico PIN Pad to implement payment service using NFC technology in order to provide its customers with multi-choice payment option at all McDonald's restaurants in Ukraine (McDonald's Ukraine selects Ingenico for contactless terminals, 2013).

As stated above, NFC is being exploited and used in many countries and multiple projects are heading towards using this technology. This thesis will be using almost the same strategy and options that the Casino "Les Belles Feuilles" in France is currently using, but in a different country dealing with different habits related to a difference in the culture, social class and behavior.

1.10. Thesis Structure

The first chapter of this research introduced the context of the study, the importance of NFC and the relationship between the end user resistances. The chapter reviewed the background information of the problem, purpose of the study, statement of the problem, significance of the study and international application.

The remainder of this thesis consists of four additional chapters. The second chapter is a literature review that investigates the models and theories related to consumers' acceptance of a new technology. The third chapter deals with the research methods used to recruit the subjects including a discussion of the design, instruments, and Procedure. The fourth chapter analyzes the data collected from the subjects, supported by tables, charts and figures; and the final chapter discusses the findings, concluding with suggestions and recommendations for further study.

Chapter 2. THE CONCEPTUAL FRAMEWORK OF THE STUDY

The previous chapter has introduced the background of the study, its objectives, research questions and hypothesis. This chapter is about the conceptual framework. It starts with the impact of user resistance and then discusses the theories that will be the foundation of this thesis. The chapter is concluded with a summary of each theory and with the formulation of the eclectic NFC model. The chapter is structured as follows:

1. Theory of reasoned action
2. Theory of planned behavior
3. Technology acceptance model
4. Status quo bias theory
5. Theory of consumption values
6. Innovation diffusion theory
7. Conclusion

With the introduction of a new information system, consumers have the possibility whether to accept it or refuse to use it based on the evaluation of change associated with the system. Therefore, a common theoretical basis is needed to explain and understand user acceptance and resistance.

The basic premise of this study is to build an integrated research model to examine and forecast consumers' adoption and use of new information technology. The basic theories which will lay foundation for this integrated research model and reviewed in this study are: Theories of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), Status Quo Bias Theory, Theory of Consumption Values and Innovation Diffusion Theory (IDT).

2.1. Theory of Reasoned Action (TRA)

TRA is a theory that identifies the factors that determines the consciously intentional behavior of persons from social psychology (Fishbein & Ajzen, 1979). This model indicates that the elements that form a person's attitude are the information that he has towards a specific object and the subjective norm, that is, the evaluation of others about adopting or not. Figure 7 shows the framework of the TRA model.

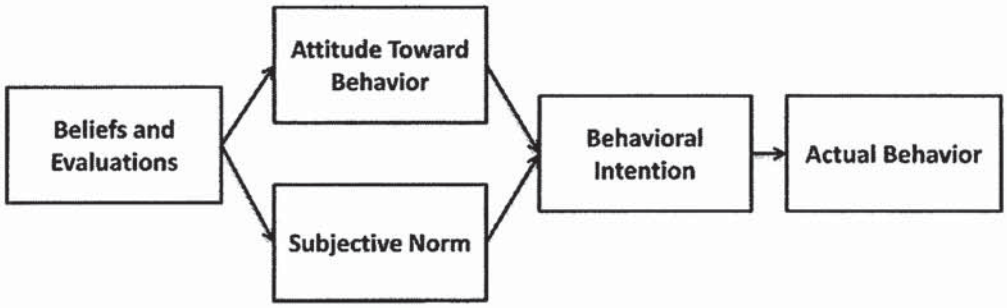

Figure 7: Theory of Reasoned Action (TRA)

As stated above, both the attitude toward behavior and the subjective norms affect one's intention to perform a specific behavior. Attitude toward behavior is the person's positive or negative feeling about performing a specific behavior or act. If City Mall's customers have negative feelings concerning the security of NFC payment then they might not be willing to adapt it unless a big number of City Mall's customers starts using it. Nevertheless, the security issue might not affect their decision to use NFC to get additional information about products since they are not disclosing personal and sensitive information.

However, the subjective norm refers to the perception that most people or relatives has in relation to the behavior in question. Most studies have shown that people's choice in performing a specific behavior is affected by what others thinks his behavior should be.

TRA was tested in many studies and appeared to be a good model to predict consumer intentions and behavior (e.g., (Fishbein & Ajzen, 1979); (Stalfors & Nykvist, 2011); (Pereira, 2012)). However, this theory is limited somehow to the fact

that is does not distinguish between a goal intention and a behavioral intention. Meaning that, it does not differentiate between an ultimate accomplishment and the act done to accomplish it. For example, Goal intention is to know additional information about a product; Behavioral intention is to ask a store representative for help or use NFC for additional information. In conclusion, TRA was directed towards the behavioral act and not towards the goal behind this behavior.

In addition, TRA did not take into consideration the presence of alternative choices and their effect on the intentions in the performance of behavior. For instance, if City Mall did not have a variety in its brands, the customers would not be confused in which product to buy and therefore will not need to use NFC to get product information. However, the presence of choice may change the intention of using NFC to better choose the product they desire and need.

2.2. Theory of Planned Behavior (TPB)

In 1991, Ajzen proposed the theory of planned behavior (TPB), which adds to the TRA theory the perceived behavioral control (Dillon & Morris, 1996).

This theory was designed to study the human behavior in specific contexts, for example, in information systems. The belief that a person has towards the access of resources and the opportunities he will get determines the perceived behavioral control. Consequently, the behavior is strongly affected by the intention of a person to get involved in it.

If City Mall's customers do not know the risks or benefits of NFC they might not use it fearing the consequences of doing so. Nevertheless, some people might be exited to use a new technology and new ways to shop without having to depend on store representatives to finish their shopping.

To a better understanding of the TPB, below is a structural diagram which shows the similarity that this Theory has with the TRA (See Figure 8).

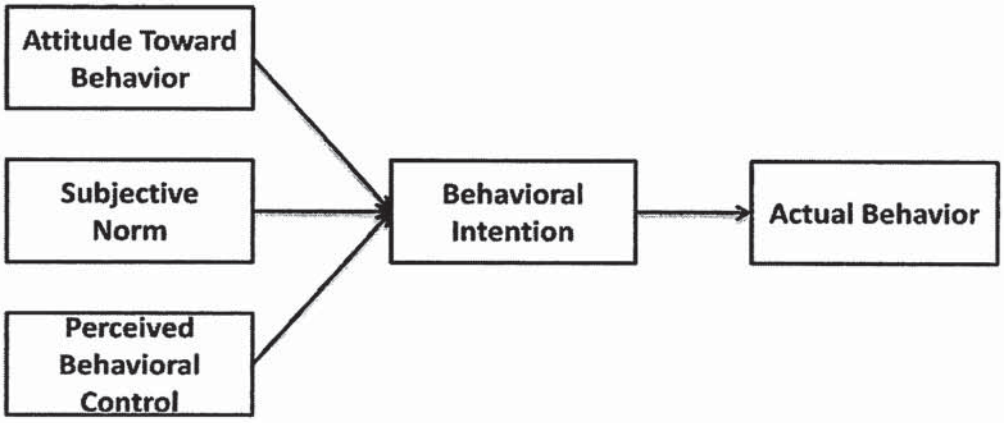

Figure 8: Theory of Planned Behavior (TPB)

This theory explained the relationship between behavioral intention and actual behavior and clarified the individual's social behavior by taking into consideration the social norm. However, TPB neglected emotional variables such as fear, threat, mood and negative or positive felling which could affect the behavioral intention.

2.3. Technology Acceptance Model (TAM)

Davis developed the TAM model in 1986 in the purpose of explaining user acceptance of information systems. This model outlines the effect of external factors on internal beliefs, intentions and attitudes by speculating two particular beliefs: Perceived usefulness and perceived ease of use. Perceived usefulness identifies the user's believes that the use of a specific application or system will increase his job performance in an organization. This research argues that using NFC in City Mall will enhance users' activities and shopping experience. Furthermore, it will provide many benefits for retailers which will encourage businesses to invest in this new technology.

Whereas perceived ease of use refers to level of effort that the users expect to make in order to use the new system (Fred, Bagozzi, & Warshaw, 1989). NFC is very easy to use and quick, however since this study is done in Lebanon and few people knows what is NFC, people might have doubts concerning its easiness (See Figure 9).

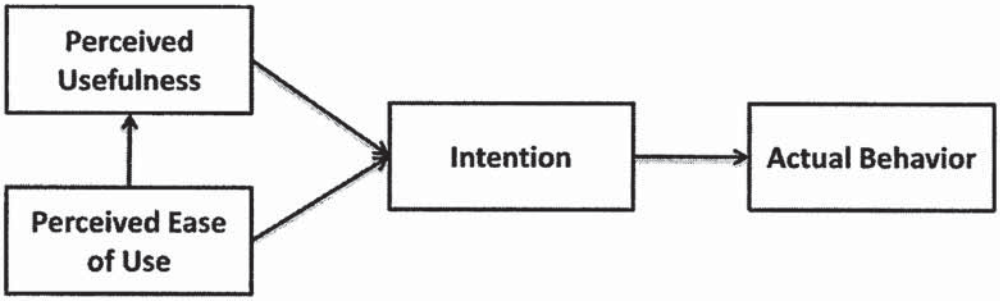

Figure 9: Technology Acceptance Model (TAM)

In 2005, Burton-Jones and Hubona stated that TAM is very important but incomplete because it was simplified to exclude individual differences (Burton-Jones & Hubona, 2005). For this reason, this research will study also individual differences such as age, education and gender.

2.3.1. Individual Differences

Individual differences include the differences in traits such as demographic variables and personality, as well as situational variables such as experience and training (Vang, 2008).

2.3.1.1. Age

In 1999, Agarwal & Prasad studied the effect of age on the acceptance of a new technology and found that younger people are expected to accept new information technology, whereas older people are expected to reject it (Agarwal & Prasad, 1999). In addition, Gomez, Egan and Bowers stated in 1986 that older people have a harder time with the new technology than younger people even when they are willing to use it (Gomez, Egan, & Bowers, 1986).

This thesis debates that nowadays technology is moving very fast, however small and old people are trying to benefit from it and learn it. And since almost all new innovations are user friendly, specially the smart phones; the age is not a big constraint.

2.3.1.2. Education

In 2005, Burton-Jones & Hubona stated that the effect of the education is same as effect of the age and that the acceptance of a new information technology is determined by the users' level of education. The concept is that the highest the education level is, the greater the ability to learn and adapt to new information technology (Burton-Jones & Hubona, 2005). However, users with lower education level might not have enough knowledge about the limitations and capabilities of information technologies and therefore change is an area of concern.

This thesis considers that people with lower education level will have security concerns regarding the storage of their credit card information on their mobiles more than people with highest education level. This is due to the fact that the lower the education level is, the less knowledge this person has the more the fear. By contrast, the highest the education levels, the more knowledge and less fear this person has.

Furthermore, people with highest education level are usually more picky and interested in the details of the products in the aim of choosing the best one in terms of ingredients, calories and country of origin. Nonetheless, people with lowest education level have lower concerns regarding the products details.

2.3.1.3. Gender

Developed countries have been studying gender effects for over a decade since it represents an important socio-cultural factor. Many studies have been conducted concerning the differences between men and women in information retrieval, communication technologies, e-learning and online purchasing behavior. Hence, the majority of the studies appear more favorably towards men than women. However, due to the increase women representation in education and work sector; this statement is seceding (Ayersman & Reed, 1995).

In the context of this study, females might be interested more in NFC to get product information whereas males might be interested in NFC for payment.

2.4. Status Quo Bias Theory

Samuelson and Zeckhauser (1988) developed the status quo bias theory in the aim of explaining consumer's preference for maintaining their current situation or status. This theory is composed of three categories: Rational decision-making, Cognitive misperceptions and psychological commitment.

2.4.1. Rational Decision-Making

Rational decision-making implicates a judgment of relative costs and benefits of change before shifting to a new alternative. Status quo bias is the result of greater costs than benefits (Samuelson & Zeckhauser, 1988).
In the rational decision-making, two classifications of cost are identified:

1. Transition costs: It is the cost needed to adapt to the new situation.
2. Uncertainty costs: It is the psychological insecurity related to the new alternative. Meaning that, switching to a new situation might cause uncertainty and anxiousness for consumers.

Considering the cost of using NFC in City Mall, consumers who carry a Smartphone that does not include NFC will have to buy a new one to be able to use this technology. Therefore, the willingness to buy a new Smartphone with NFC enabled is affected by the usefulness and need of using NFC in City Mall. Whereas consumers with NFC enabled mobiles will not have any additional cost.

2.4.2. Cognitive misperceptions

Status quo bias is also a result of cognitive misperception of loss aversion. Loss aversion is a psychological standard that refers to people's tendency to prefer avoiding losses to acquire gains. It is considered to result in status quo bias because even small losses that could result from the change from the current situation might be perceived larger than they truly are.

With NFC, no losses will be incurred for consumers since they will be using it to facilitate their shopping procedure.

2.4.3. Psychological commitment

There are three main factors that affect psychological commitment: Sunk Cost, Social norms and efforts to feel in control.

1. Sunk cost: Refers to costs that have already been incurred and cannot be recovered. In other words, money paid on previous commitments which might cause an unwillingness to invest in a new alternative.

   This will occur with customers who has a new Smartphone which is unfortunately not NFC enabled and will have to buy a new one to use this technology.

2. Social norms: Other person's opinion might influence the consumers' choice whether to accept this change or not.

   This research studies the effect of the consumers' friends or relatives towards using NFC in City Mall.

3. Efforts to feel in control: Fear of losing control by switching to a new unknown system or different way of working.

   As stated before, the use of NFC in City Mall will not change the customer shopping practice but simply support it and accelerate the checkout process.

This theory like the TAM, didn't take into consideration individual differences such as age, education and gender; which will be studied in the context of this study.

2.5. Theory of Consumption Values

Jagdish, Newman and Gross presented in 1991 a theory of consumption values which defines five factors that influences the consumer choice behavior. This theory is designed for all products and services and the five factors are: functional value, social value, emotional value, epistemic value and conditional value (Jagdish, Newman, & Gross, 1991).

2.5.1. Functional Value

It is deduced to be the major driver of consumer choice and defined as the consumer's perceived utility of the product or service. With NFC, the functional value is the possibility to pay for products and services using the Smartphone and find additional information about the products without the need for any external help.

2.5.2. Conditional Value

Conditional value is the correlation between the new product or service and consumers conditions. If the new product or service is not effective, then the consumer will not adopt it. This is very effective when talking about mobile payment, since over the past couple of years; many inefficient and ineffective mobile payment methods were introduced.

2.5.3. Social Value

It is the consumers' gain from sharing similar products or services with other groups of individual. Using NFC, consumers can transfer money and information through their mobiles. Information such as: photos, contacts, applications.

2.5.4. Emotional Value

It is the consumers' negative or positive feeling towards a product or service. Using NFC, consumers will be able to shop freely without the need of store representatives. However, the unsafe perception of payment using

mobiles is critical since many individuals fear the security of mobile payment.

2.5.5. Epistemic Value

It is the consumers' tendency to adopt new technologies. The perceived utility acquired from using a specific product or service will arouse curiosity and provide the consumer with a desire to learn more. Nowadays, the major growth in the technology is creating a foundation for NFC since consumers are becoming more open in taking advantage of all the options provided by their Smartphone (Refer to the Figure 10 below).

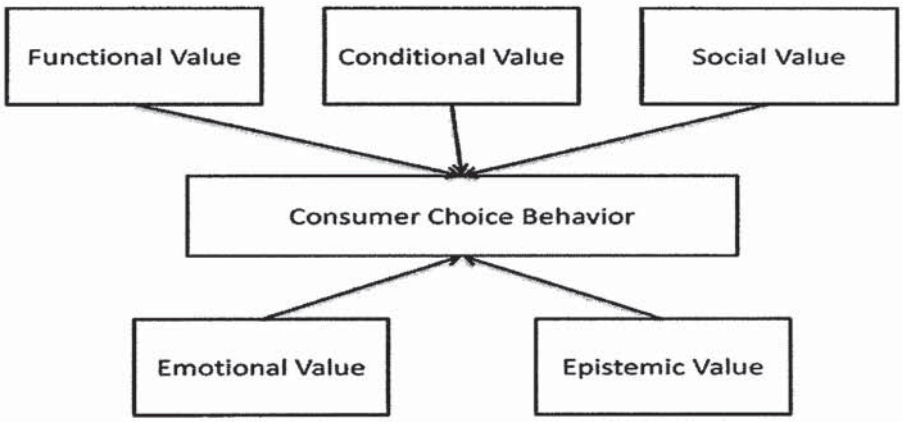

Figure 10: Theory of Consumption Values

2.6. Innovation Diffusion Theory (IDT)

Rogers developed the IDT model in 1963 in order to study the user adoption of a new technology. The two key elements used in this theory are the user's acceptance and use of new technology or goods. In 1995, Rogers concluded that there are five factors that influence the potential adopters' attitudes and intentions during the adoption process (Chen & Adams, 2005)

2.6.1. Relative advantage

If the potential adopters identify that the new product or service is better than the existing one, then it can be forecasted that they will accept it.
NFC technology will likely offer a relative advantage for both City Mall and City Mall's clients since the latter will be able to benefit from using wallet-enabled cell phones, attain additional information about products and restaurants without having to rely on anyone, reserve in Cinema City with no fear of waiting behind a queue. Furthermore, the business will have the possibility to better serve its clients with less cost of salaries (Ibid).

2.6.2. Complexity

When the potential adopters find it difficult to understand the usage of the new product or service, they will probably reject it and remain working on the product they are familiar with.
NFC is very easy to use, since it offers its users the simple act of touching or placing their device close to a tag to initiate the desired service. Therefore, NFC eliminates the need for the users to make complex manual configurations (Ibid).

2.6.3. Compatibility

When an innovation is perceived to be consistent with existing values and experience and is able to provide alternative or supplementary products or services without a lot of effort to learn it, potential adopters are likely to accept it.
As already stated before, NFC is very easy to use and learn. It will not change how the users shop or pay but will simply support and accelerate it (Ibid).

2.6.4. Trialability

When the potential adopter try the new product or service and finds that it meets his requirements, such as cost, quality of service and so on, then he is likely to accept it and adopt it.

Besides, NFC is very secure since it works on a short range wireless connection and doesn't cost a lot (Ibid).

2.6.5. Observability

If the results of an innovation are not observable to others then it will have adoption issues. In order to make the targeted user group be aware of the service, the innovation should attract their attention especially when users will use it in public at a later stage (See Figure 11) (Ibid).

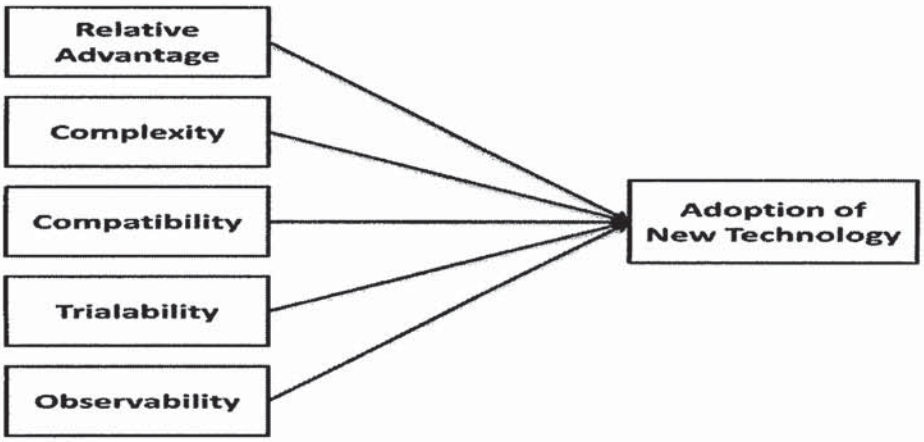

Figure 11: Innovation Diffusion Theory (IDT)

This theory has been successfully used in many fields including public health, communication, criminal justice, agriculture, social work and marketing. However, it didn't take into consideration an individual's resources or social support to adopt the new behavior.

2.7. Conclusion

As stated above, the basis theories that will be used in this study are: Theories of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), Status Quo Bias Theory, Theory of Consumption Values and Innovation Diffusion Theory (IDT).

Below, a quick summary of each theory is found, in which the theories' core constructs, definitions and limitations will be included.

Theory of Reasoned Action (TRA)	
TRA was developed by Ajzen in 1980. It is a theory that identifies the factors that determines the consciously intentional behavior of persons from social psychology. It is one of the most fundamental and influential theories of human behavior.	
Core Constructs	**Definitions**
Attitude Toward Behavior	An individual's positive or negative feelings about performing a specific behavior or task
Subjective Norm	The person's perception that most people or relatives think he should or should not perform the behavior in question
Limitations	
• This theory does not distinguish between goal intention and a behavioral intention • TRA does not take into consideration the presence of alternative choices and their effects on the intentions in the performance of behavior	

Table 2: Summary of Theory of Reasoned Action (TRA)

Theory of Planned Behavior (TPB)	
Ajzen extended TRA in 1991 and proposed the TPB theory which adds to the TRA theory the perceived behavioral control. TPB has been successfully applied for the understanding of individual acceptance and usage of many different technologies.	
Core Constructs	**Definitions**
Attitude Toward Behavior	Adapted from TRA
Subjective Norm	Adapted from TRA
Perceived Behavioral Control	The belief that a person has towards the access of resources and the opportunities he will get determines the perceived behavioral control
Limitations	
This theory neglects emotional variables such as fear, threat, mood and negative or positive feeling which could affect the behavioral intention	

Table 3: Summary of Theory of Planned Behavior (TPB)

Technology Acceptance Model (TAM)	
Davis developed the TAM model in 1986. This theory outlines the effect of external factors on internal beliefs, intentions and attitudes by speculating the below two constructs.	
Core Constructs	**Definitions**
Perceived Usefulness	Identifies the user's belief that the use of a specific application or system will increase his job performance in an organization
Perceived ease of use	Level of effort that the users expect to make in order to use the new system
Limitations	
This theory is simplified to the fact that it excluded individual differences such as age, education and gender	

Table 4: Summary of Technology Acceptance Model (TAM)

Status Quo Bias Theory	
Samuelson and Zeckhauser developed the status quo bias theory in 1988 in the aim of explaining consumer's preference for maintaining their current situation or status.	
Core Constructs	**Definitions**
Rational Decision-Making	Judgment of relative costs and benefits of change before shifting to a new alternative • Transition costs: Needed cost to adapt to a new situation • Uncertainty costs: Psychological insecurity related to the new alternative
Cognitive Misperceptions	Psychological standard that refers to people's tendency to prefer avoiding losses to acquire gains
Psychological Commitment	• Sunk cost: Incurred cost that cannot be recovered • Social norms: Effect of other person's opinion on the consumers' choice of whether to accept this change or not • Efforts to feel in control: Fear of losing control by switching to a new unknown system or different way of working
Limitations	
This theory like the TAM, didn't take into consideration individual differences such as age, education and gender	

Table 5: Summary of Status Quo Bias Theory

Theory of Consumption Values	
Sheth et al. presented in 1991 a theory of consumption values which defines five factors that influences the consumer choice behavior for all products and services.	
Core Constructs	**Definitions**
Functional Value	Major driver of consumer choice and defined as the consumer's perceived utility of the product or service
Conditional Value	Correlation between the new product or service and consumers conditions. If the new product or service is not effective, then the consumer will not adopt it
Social Value	Consumers' gain from sharing similar products or services with other groups of individual
Emotional Value	Consumers' negative or positive feeling towards a product or service
Epistemic Value	Consumers' tendency to adopt new technologies
Limitations	
The main limitation of this theory is that it cannot be used to predict the behavior of two or more individuals. Nevertheless, in case the individuals form a group, this concept might not be true since they share the same perceived values.	

Table 6: Summary of Theory of Consumption Values

Innovation Diffusion Theory (IDT)	
This theory was developed by Rogers in 1963 in the aim of studying the user adoption of a new technology. The two key elements used in this theory are the user's acceptance and use of new technology or goods	
Core Constructs	**Definitions**
Relative Advantage	The degree to which an innovation is perceived as being better than its antecedent
Complexity	The degree to which an innovation is perceived as being hard to use
Compatibility	The degree to which an innovation is perceived as being reliable with the existing values, needs, and past experiences of potential adopters
Trialability	The degree to which an innovation is perceived to meet the potential adaptors requirements, such as cost, quality of service and so on

Observability	The degree to which an innovation is perceived to as being observable to others
Limitations	
IDT didn't take into consideration an individual's resources or social support to adopt the new behavior.	

Table 7: Summary of Innovation Diffusion Theory (IDT)

2.7.1. Variables Relationship

This thesis is directed towards the formulation of the eclectic NFC model which will be constituted of the variables extracted from the above theories.

The picture that follows (Figure 12) is a graph that shows the relationship between the variables of the theories in question.

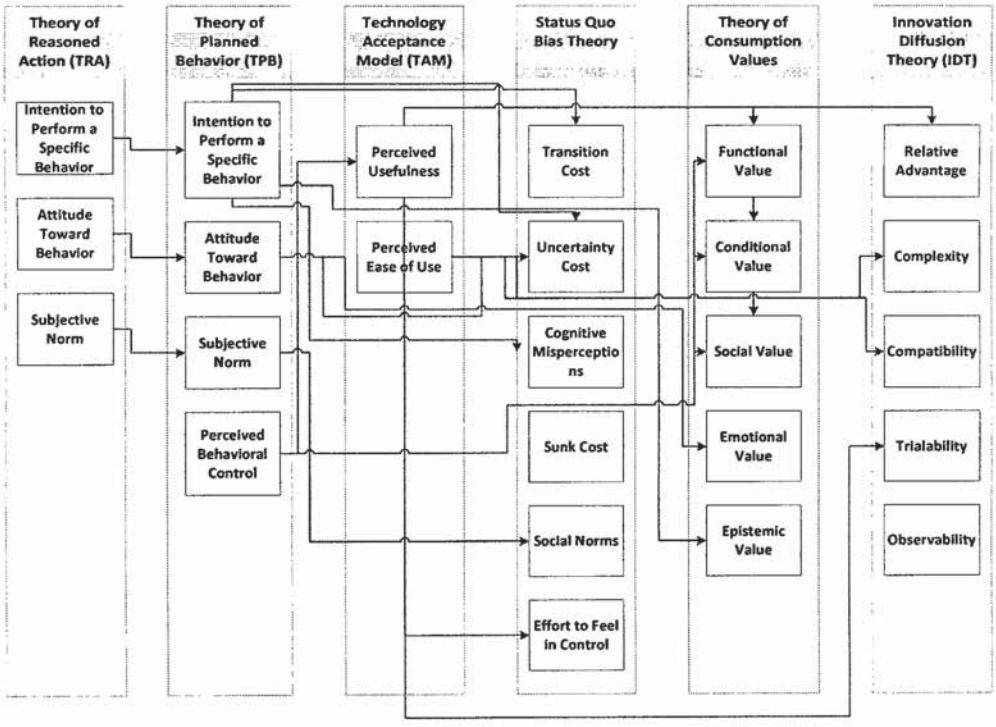

Figure 12: Relationship between the theories

The discussion that follows will elaborate the relationship between the variables and how they correlate with each other.

1. Since TPB is a result of TRA then the intention to perform a specific behavior is the same.
   Epistemic value is the consumers' tendency to adopt new technologies which contribute to the intention to perform a specific behavior.

   In addition, transition cost is the cost needed to adapt to a new situation which might affect the intention to perform a specific behavior.

   Furthermore, cognitive misperception can also affect the intention to perform a specific behavior because if an individual prefers avoiding losses to acquire gain than he might not have the intention to perform the behavior.

   Moreover, insecurity related to the new alternative might also have an effect on the intention to perform the behavior.

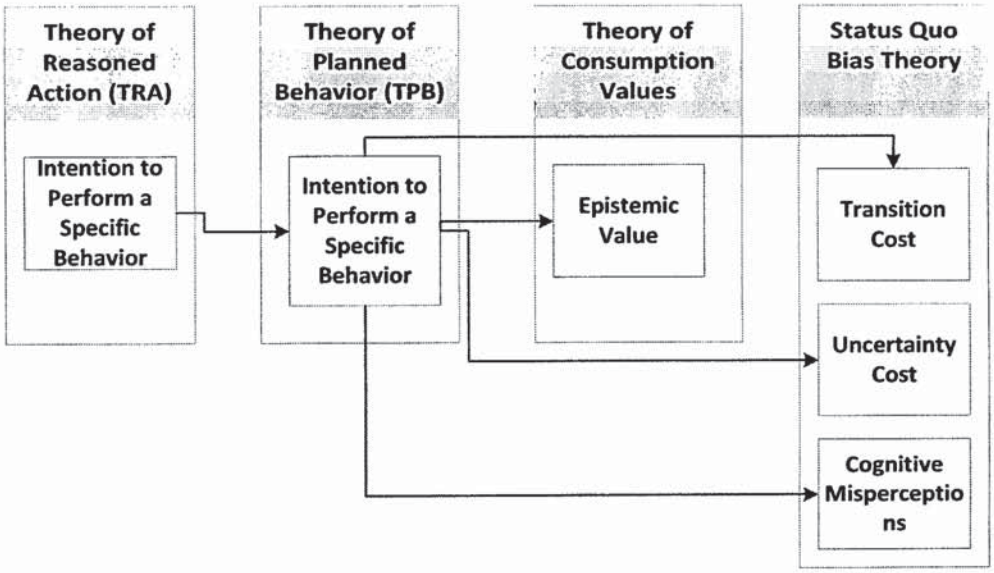

Figure 13: First Relationship

2. Since TPB is a result of TRA then the attitude toward behavior is the same.
   Emotional value indicates the consumers' negative or positive feeling towards a product or service; therefore it determines the attitude toward behavior.

However, uncertainty cost is the insecurity felt towards the new alternative which could negatively affect the consumers' emotional value.

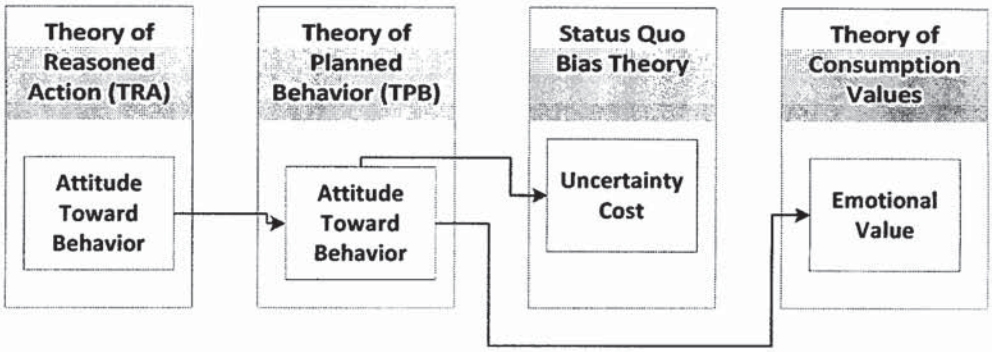

Figure 14: Second Relationship

3. Since TPB is a result of TRA then the subjective norm is the same. Subjective norm indicates the person's perception that most people or relatives think he should or should not perform the behavior in question; whereas the social norms is the effect of other person's opinion on the consumers' choice of whether to accept this change or not. Consequently, both variables study the effect of relatives or friends on the consumers' choice.

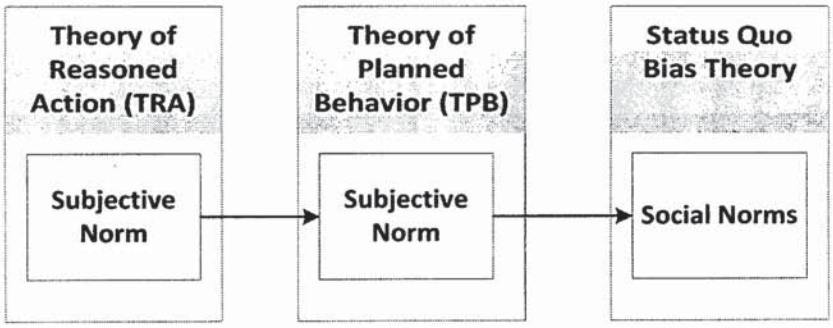

Figure 15: Third Relationship

4. Perceived behavioral control is determined by the belief that a person has towards the access of resources and the opportunities he will get. The opportunities he will get is influenced by the perceived usefulness, utility, effectiveness, gain, relative advantage and requirements.

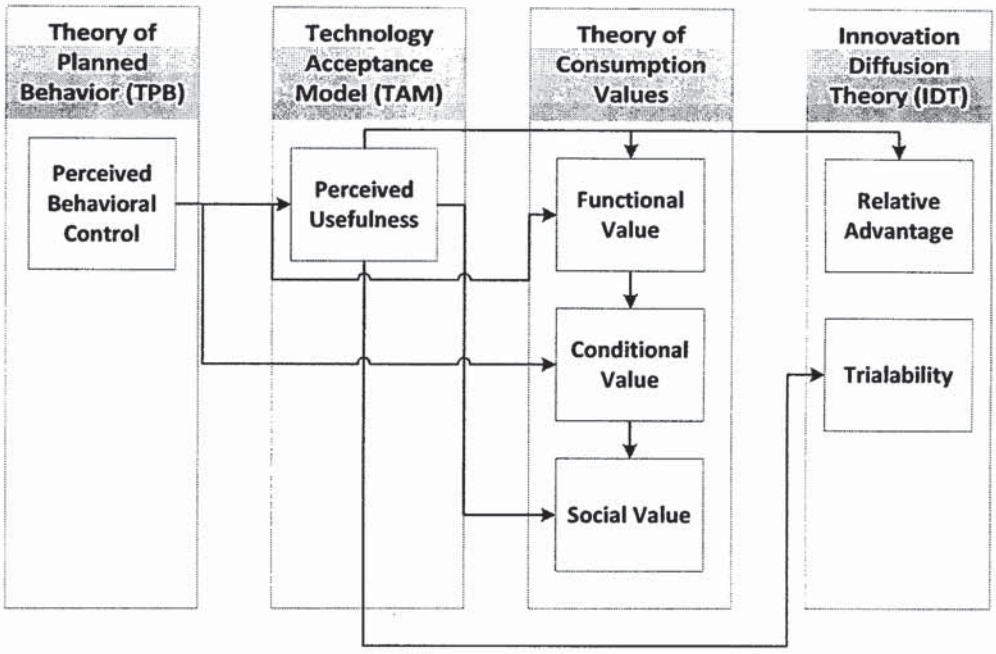

Figure 16: Fourth Relationship

5. The fear of losing control is affected by the perceived ease of use which is by itself determined by the level of complexity and compatibility

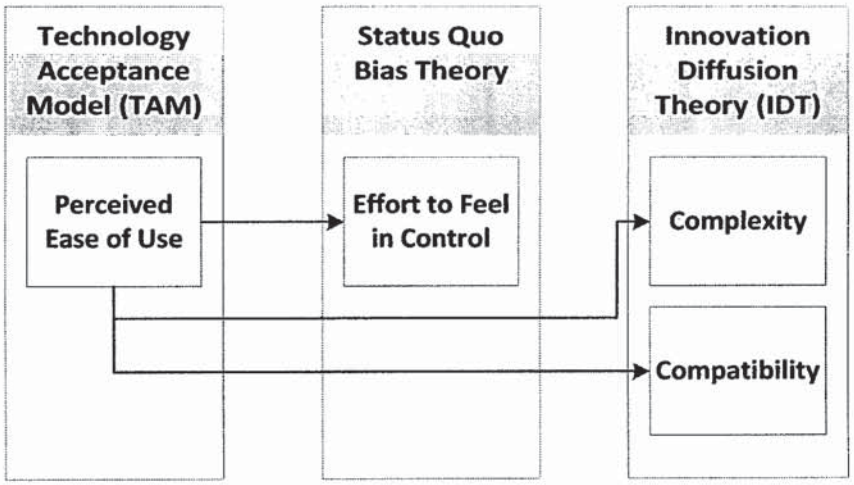

Figure 17: Fifth Relationship

2.7.2. Eclectic NFC model

As already stated above; this thesis is directed towards the formulation of the eclectic NFC model. The core constructs of this model are the following:

1. Transition cost, extracted from the first relationship
2. Security effectiveness, extracted from the second relationship
3. Subjective norms, extracted from the third relationship
4. Opportunities and gain, extracted from the fourth relationship
5. Ease of use, extracted from the fifth relationship
6. Individual differences

To a better understanding of this model, below is a structural diagram which details this representation. (See Figure 18)

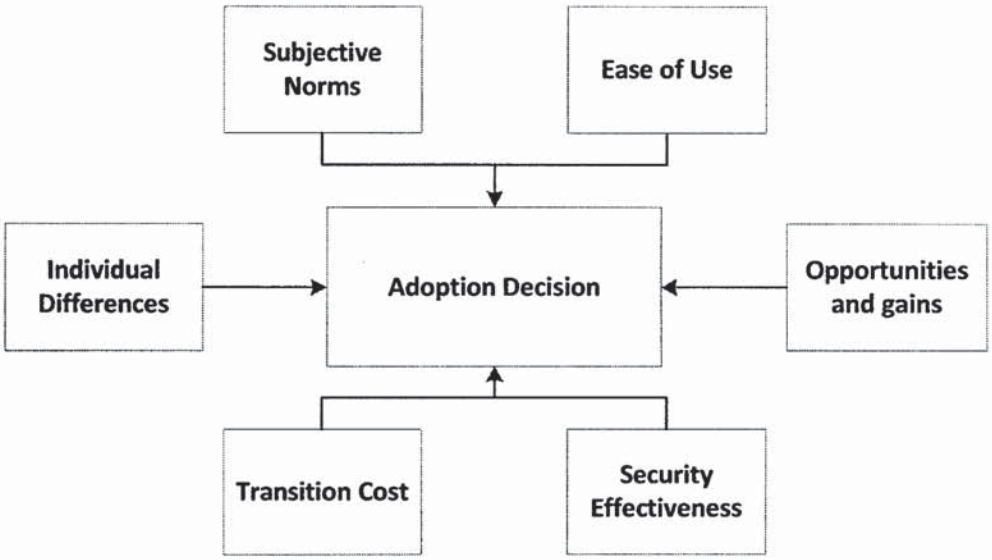

Figure 18: Eclectic NFC model

Chapter 3. LITTERATURE REVIEW

The literature review covers a broad research that explores the consumers' acceptance and adoption of a new technology. This study is very essential since the success of a new technology is highly affected by the acceptance of the parties involved. The chapter is structured as follows:

1. Previous research
2. Conclusion

3.1. Previous Research

As stated before, TAM and IDT are the most common theories that studies the users' acceptance and adoption of a new system. Dahlberg, Mallat, Ondrus and Zmijewska (2007) argued that the above theories have been widely used in researches that studies the users' acceptance and adoption of mobile payments (Dahlberg, Mallat, Ondrus, & Zmijewska, 2007). Furthermore, most research studies the adoption of mobile payments without focusing on the use of NFC; the focus was on mobile banking and m-commerce where transactions are initiated through SMS or a voice call.

In addition, Chen and Adams (2005) formed a theoretical model for user acceptance of mobile payments in the aim of identifying and explore the key factors that affect the decision of whether to use mobile payments or not. This model was developed using TAM and IDT theories without specifying the mode of payment (Chen & Adams, 2005). This model found that a user's attitude has a significant impact on his/her behavioral intention.

Recently, a more deep research about the adoption of NFC in mobile payment was conducted by Tan and Ooi (2011). The latter, also used the TAM theory to develop his model supported by a survey to confirm it. In addition to the perceived ease of use and perceived usefulness of the TAM model; Tan et al. added two more variables which are social influence and personal innovativeness in information technology (Tan W., 2011).

1. Perceived usefulness:

   This study stated that perceived usefulness was detected to be important in forecasting the intention to adopt mobile credit card in Malaysia and plays an important role in the acceptance of mobile services. Therefore, in order for mobile credit card to be accepted, this method should have more advantages than cash or credit card. The main advantage of mobile credit card is that it is six seconds faster when compared to PayPass cards.

   The hypothesis synthesized here is: Perceived usefulness has positive relationship towards mobile credit card adoption in Malaysia.

2. Perceived ease of use:

   Like the perceived usefulness, perceived ease of use has been a core predictor of various IT adoptions. Mobile payment adoption is a concern since there are several steps involved upon payment and the process can be very complicated. In addition, mobiles are limited by small screens and battery life span, poor resolution, small keyboard and text input facilities. Consequently, consumers will have a positive attitude towards mobile credit cards if they perceive that it does not require much mental effort to use.

   The hypothesis synthesized here is: Perceived ease of use has positive relationship towards mobile credit card adoption in Malaysia

3. Social influence:

   Social influence is part of the TPB and TRA and was validated in many IT studies. Social influence is the person's perception that most people who are important to him think he should or should not perform the behavior in question. Looking at subjective norms as being an important factor in the intention to adopt new technology, it is also expected to influence the adoption of mobile credit card.

   The hypothesis synthesized here is: Social influence has positive relationship towards mobile credit card adoption in Malaysia.

4. Personal innovativeness in information technology:

   Personal innovativeness is a trait reflecting the willingness of a person to try a new technology. Innovative consumers are more curious and dynamic thus they have the ability to imagine, understand and value

the benefits associated with the innovation. Consumers with higher personal innovativeness are more likely to be risk takers and therefore more likely to develop positive intention to adopt new innovation. The following hypothesis is produced here: Personal innovativeness in information technology has positive relationship towards mobile credit cards adoption in Malaysia.

Due to its recent growth, little scientific research has been conducted about NFC. In 2010, Özdenizci observed that there are little published articles that talk about NFC literature review. However, many academics are very attracted towards NFC since it is growing rapidly and has many promising applications and related services (ÖZDENİZCİ, AYDIN, COŞKUN, & OK, 2010).

Wiechert et al. studied in 2008 the effects of NFC on the customer shopping process in retail stores. They identified five applications of NFC that could be used in retail stores: Payment, download of information, loyalty applications, rebate coupons, and product information. In order to visualize how these applications could affect the way people shop, they conducted nine semi-structured interviews with European retailers in Switzerland and Germany. These interviews concluded that supermarket and drug store operators were very interested in NFC technology since it has the ability to accelerate the check-out process, whereas the operators of apparel stores and other specialty stores were interested in offering their customers information on the sales floor (Wiechert, Schaller, & Thiesse, 2012).

Wiechert, Schaller, Thiesse and Fleisch investigated the adoption of NFC by retailers in 2009. They conducted a survey amongst European retailers to explore their plans and observation with regards to NFC based applications. The respondents agreed that NFC has the potential to accelerate the check-out process but its implementation will result in additional costs. But, the most surprising result of the survey was that the respondents were not sure that their customers will be enthusiastic about this new technology (Wiechert T. J., Schaller, Thiesse, & Fleisch, 2008).

In June 2011, Roeen Roashan investigated if consumers in Denmark will adopt Near Field Communication based mobile payment. This study used the theory

of consumption values in order to determine the factors that will affect consumers' choice in whether to adopt NFC in Denmark. Backed by a survey, this study found that 84% of the population prefers credit card payment method, 8% prefer internet banking and the remaining 8% prefer cash. In addition, it concluded that the level of awareness of NFC is not high but the potential of adopting NFC based mobile in Denmark is very high. This study summarized that perceived compatibility and individual mobility are the main drivers of consumers' acceptance of mobile payment (Roashan, 2011).

In addition, Peter and Rasmus studied in 2011 the factors that affect the Swedish consumers to use mobile payment services (Stalfors & Nykvist, 2011). This paper used five constructs depicted from TRA, TPB and TAM to measure consumer acceptance; Perceived compatibility, Perceived usefulness, Perceived Ease of use, Perceived security and subjective norm. This study concluded that the main determinants for consumers' acceptance of mobile payment services are perceived compatibility and perceived usefulness. However perceived security is essential to old generations rather than younger ones. Perceived ease of use and subjective norm were not found significant in determining the consumers' acceptance of mobile payment services.

In 2012, Pereira studied the consumer adoption of NFC mobile wallets using TRA, TPB and TAM (Pereira, 2012). This study found that the perceived value of the service determines the attitude towards intention to use NFC mobile wallets. Moreover, perceived ease of use and trust were found to have a great influence on the attitude towards intention to use NFC mobile wallets.

Finally, in 2008 a research was conducted to study user resistance of new information system. This research used the status quo bias theory to explain that user resistance can be due to the bias or preference to stay with the current situation. Switching cost was found to be very important in increasing user resistance whereas perceived value was found to reduce user resistance (W. & A., 2008).

3.1.1. NFC and Security

Nowadays, due to the innovative technology and advanced methods, people are relying on technology to solve many things in their daily lives. Hence, security is a main issue since we are dealing with sensitive information.

There are three important aspects that will affect the success of NFC:

1. Confidence that personal data and financial transactions used in applications prevails confidential
2. Elasticity of the security technology offered to manufacturers and service providers
3. The overall performance of the system, which will affect the consumer satisfaction

Open applications that are used for information exchange do not require a high level of privacy and therefore does not need a high level of security and data protection. However, applications that access personal and financial documents need a high level of security. Therefore, in mobile phones, there is a Security Element (SE) that handles all the security issues. This SE stores the person's personal and financial information.

SE is a secure microprocessor that uses a cryptographic processor to authenticate and secure transactions and provide a safe memory for storing payment applications, a person's personal and financial information, transit payment and ticketing, secure identification and building access.

There are three forms of SE:

1. Separate chip on the printed circuit board of the phone
2. External memory card
3. In the Subscriber Identity Module (SIM) Card

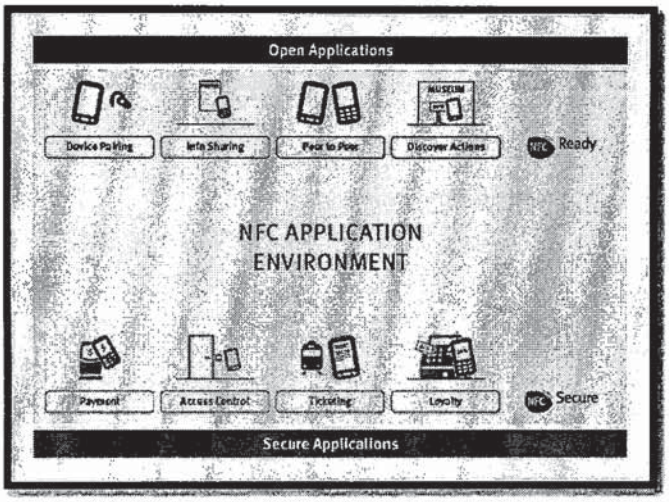

Figure 19: Typical applications utilizing NFC

Source: (Infineon Technnologies, 2012)

In order to be secure, NFC mobiles uses authentication modes in order to be secure. Authentication is achieved when the device involved is actually the correct one. This process should be classified in order to ban unauthorized individuals from accessing information, signals functionalities or commands that only authorized individuals can.

3.2. Conclusion

According to the research that has been conducted on NFC, all of them focused on the use of NFC technology for mobile payments, the retailers and customers perception on the adoption and application of NFC and the use of NFC in the acceleration of the checkout process. Despite the abundance of research in this area, the consequences of implementing all the applications that NFC provides in one single place have not been previously explored. This research covers this gap in the literature by investigating the implementation of NFC from two perspectives; the customers' and retailers' side in City Mall in Lebanon.

Based on the reviewed literature, this research will be unique since it will study many new aspects. It is the first to investigate the adoption of NFC technology in

City Mall. This will offer new approaches that might extend the existing knowledge about NFC in Lebanon and will probably encourage malls to implement it. In addition, this study will add a new contribution by introducing an emerging unique technology.

The chapter that follows will examine the methodology of the study as guided by the conceptual framework of this thesis.

Chapter 4. THE RESEARCH DESIGN OF THE STUDY

4.1. Introduction

This chapter discusses the research design of the study, i.e., the plan and process of how the research was conducted (Polit & Beck, 2004). Particularly, it outlines the objectives of this study which are already presented in section 1.5 in chapter 1. Moreover, this chapter provides information about the respondents involved in the study and how they were selected. Detailed information about the gathering of data needed to address the objectives and research questions of the study, and how these data were analyzed are discussed. Finally, the chapter demonstrates reporting of the research findings.

Based on the literature review stated above, a glut of researches was conducted on NFC but none of them studied the advantages and disadvantages of its implementation in a mall. Therefore, the objective of this research design is to investigate or understand the experiences of the consumers in relationship to the introduction of NFC in City Mall. The purpose is to find the causes that might affect consumers to accept or reject such new technology. Based on the eclectic NFC model depicted from the conceptual framework, specific research questions were developed to explore and understand this issue. The research design was to conduct a survey at City Mall. This simple design is consistent with quantitative research.

As discussed in section 1.3 of chapter 1, the goal of this thesis is to identify the key factors that affect the consumers' acceptance of NFC and mobile payments. Therefore, the following objectives are set to achieve the goal:

1. Identify the added values
   The initial objective of this thesis is to identify the added values that City Mall will get and the problems that will be solved by implementing NFC.
2. Study user acceptance of NFC in City Mall
   Since the implementation of NFC in City Mall is mainly studied to better serve clients, the level of their acceptance will have a high influence on the decision of City Mall on whether to implement it or not; therefore it will be studied in this thesis.

3. Study the level of security of NFC

   As stated above, NFC will be used for many functions such as: Mobile payment and ticketing. And since we are dealing with sensitive data, we should study the level of security of NFC.

4.2. Selected variables

The eclectic NFC model depicted from the conceptual framework in section 2.7.2 of chapter 2 included the following core constructs: Subjective norms, ease of use, opportunities and gains, security effectiveness, transition cost and individual differences.

In line with the conceptual framework and the eclectic NFC model, the independent variables are age, gender and education level. The dependent variables are NFC opportunities or advantages, NFC security threats, NFC usefulness or trend and NFC adaptability. Therefore, the relationship between each independent variable and the dependent variable was analyzed to a better understanding of consumer acceptance of NFC in City Mall.

4.3. Research Questions

Just to recap, below are the research question already stated in section 1.6 of chapter 1 of this thesis.

1. What are the respondents' views towards the implementation of NFC in the grocery store in City Mall?
2. What type of dimensions did the eclectic model produce as yielded from respondents' views?
3. What variations are found on the new dimensions according to age, gender and educational level variables?

Since this research is studying the user acceptance or rejection of NFC in the grocery store in City Mall, these research questions will help businesses to determine the factors that will affect consumers in whether to accept or reject this technology.

4.4. Research Hypotheses

In recapitulation, the hypotheses this thesis tested and which were already stated in section 1.7 of chapter 1 were.

H_1: Variables extracted from multiple technology theories employed in this study will yield new dimensions emerging from the Lebanese context.

As stated in section 2.7.2 of chapter 2, the variables this thesis will study are:

1. Transition cost
   Given that some individuals have financial issues, they will possibly be affected by the cost needed to shift to the new technology unless they really need it. Therefore this research will study if the transition cost can affect the decision of City Mall's customers whether to adapt to NFC or not.
2. Security effectiveness
   Since with NFC payment we are dealing with sensitive data, security effectiveness is a very critical issue which needs to be taken into consideration while dealing with consumer acceptance of this technology. However security concerns might vary from individual to individual, the dependencies affecting this decision will be studied as well.
3. Subjective norms
   People are usually affected by their environment, relatives and friends. For that reason, this study aims to identify if the individual's relative perception towards accepting or rejecting NFC affects their decision towards its approval.
4. Opportunities and gain
   Since the level to which an innovation is perceived to have opportunities and gains could have an effect on its adoption. This research will study the degree to which this variable could affect consumers' acceptance of NFC in City Mall.
5. Ease of use
   In this research, since we are studying the user acceptance or rejection of NFC in City Mall, and because some individuals has problem with adapting

to new technologies; the level to which ease of use could affect NFC acceptance or rejection will be studied.

H_2: Because of different value systems nourishing respondents' attitude to technology (Teo, 2010), variations on the new emerging dimensions will be found based on respondents' gender and educational level.

a. Gender

   Since the level of acceptance of new technologies might also vary between females and males, this thesis is directed towards finding if it has an effect on the acceptance or rejection of NFC in City Mall.

b. Educational level

   Since the level of acceptance of new technologies might also vary based on the individuals' education level, this thesis is directed towards finding if it has an effect on the acceptance or rejection of NFC in City Mall.

H_3: Since age appears to be a determinant in explaining attitudes to technology (Alharbi, 2012), it is hypothesized that age will explain variance in the new devised technology dimensions yielded from factor analysis.

Since the level of acceptance of new technologies might vary between age and age, this thesis is directed towards finding if the age has an effect on the acceptance or rejection of NFC in City Mall.

4.5. Research Design

NFC is an approach to provide users with lots of new options with a simple, easy and fast way. Additionally, it is being investigated as a way to maximize reliability while providing its user with a high level of security.

4.5.1. Methodology

To address these issues, this study used a survey research design to gather quantitative data in order to examine the factors affecting customer's acceptance or resistance to the use of NFC in the grocery store in City Mall.

A questionnaire was used for data collection since it is practical, cost effective and anonymous for both respondent and researcher.

4.5.2. Sampling Process

The target population for this study was approximately 300 of City Mall's customers since the implementation of NFC will be done in the grocery store in City Mall. The sampling frame was obtained using an opportunistic sampling technique[1] where the respondents were selected because they happened to be in City Mall during the process.

All participation was anonymous, with only one survey response permitted by participant (n = 215).

4.5.3. Ethics of research

While conduction a research, there are several obligations that needs to be taken into consideration in order to meet the ethical standards. The first ethical consideration is autonomy, which refers to the investigators' obligation to respect each participant as a person capable of making an informed decision regarding the participation in the survey. The investigator must ensure that each participant receives a full disclosure of the nature of the study, the risks, benefits and alternatives, with an extended opportunity to ask questions. In addition, the investigator must specify to the participant how privacy and confidentiality concerns will be approached.

Therefore, an informed consent document was created to ensure that individuals are voluntarily participating in the research with full knowledge of relevant risks and benefits. This document contains the below:

1. The rationale of the research
2. Expected duration of the survey
3. Right to reject to participate in the survey or withdraw once the survey was started and the consequences of doing so
4. Factors that may influence their willingness to participate

[1] http://www.alleydog.com/glossary/definition.php?term=Opportunity+Sampling

5. Any potential research benefits
6. Limits of confidentiality
7. Incentives for participation
8. Contact person for questions

The informed consent document appears in APPENDIX A.

4.5.4. Instrumentation

The original concept for the questionnaire (Appendix B) was to offer paper version in both languages: English and Arabic. Furthermore, each participant filled out a research participant consent form prior to accessing and completing the survey.

Since the questionnaire will be conducted at City Mall in Lebanon and not all City Mall's customers are familiar with the English language, two versions of the questionnaire was created: English and Arabic. This strategy was chosen in order to be able to target all levels and kind of the Lebanese population.

4.5.4.1. Questionnaire

The questionnaire included four sections, labeled A-D. Section A, gathered information about the participant's shopping experience and the kind of phone he owns or would like to own; Section B, used a rank order method in order to know the participant's shopping preferences like raking the characteristics that the individuals looks for when choosing the location to shop (e.g., Shopping in a specific supermarket depends on) and how he uses his mobile phone like (e.g., How do you use your mobile phone?; what are the criteria for choosing a new cell phone?); Section C, used a 5-point Likert scale was developed to answer the variables identified in the table 1 below extracted from the conceptual framework.

Additionally, specific information about the participant was gathered in section D in order to round out the data and allow for more comparative analysis of potential factors affecting consumers' acceptance of NFC in City Mall (See APPENDIX B).

To minimize response bias, item statements were mixed as much as possible to ensure that the respondents read each item before responding.

Below, a chart showing the number of questions per each category in the questionnaire.

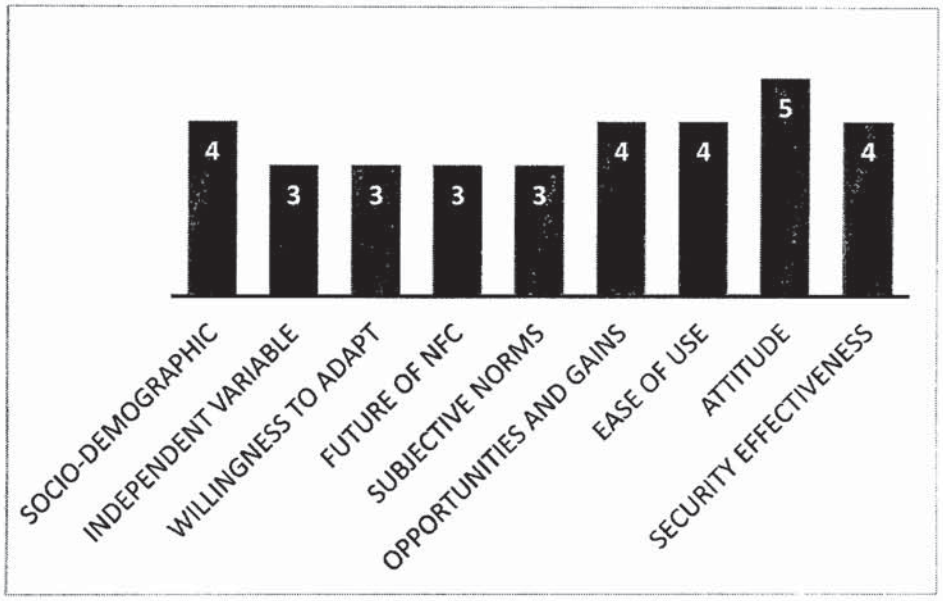

Figure 20: Questionnaire items count per category

Table 8 shows the interrelation of theories discussed in chapter 2, variables excerpted and questionnaire items corresponding to them.

Theory	Variables excerpted	Questionnaire item that correspond to the variables
Reasoned Action (TRA)	Intention to perform a specific behavior.	1. Willingness to adapt NFC technology 2. Attitude about using NFC-payment, when possible
	Person's positive or negative feeling about performing a specific behavior or act.	1. The future of NFC
	Person's decision is affected by what others think his behavior should be	1. My peers perception towards using NFC influences my behavior
Planned Behavior (TPB)	Intention to get involved in a specific behavior	1. Willingness to adapt NFC technology 2. Attitude about using NFC-payment, when possible
Technology Acceptance Model (TAM)	Perceived usefulness	1. Benefits and advantage of NFC
	Perceived ease of use	1. Easiness of NFC
	Individual differences	1. Age 2. Gender 3. Education level
Status Quo Bias	Rational decision-making	1. Willingness to adapt NFC technology 2. Attitude about using NFC-payment, when possible
	Cognitive misperceptions	1. Major security threats
	Psychological commitment	1. Willingness to adapt NFC technology 2. My peers perception towards using NFC influences my behavior
Theory of Consumption Values	Functional Value	1. Benefits and advantages of NFC
	Conditional Value	1. Benefits and advantages of NFC
	Emotional Value	1. Benefits and advantages of NFC 2. Major security threats
	Epistemic Value	1. Easiness of NFC 2. Attitude about using NFC-payment, when possible
Innovation Diffusion (IDT)	Relative advantage	1. Benefits and advantages of NFC
	Complexity	1. Easiness of NFC
	Observability	1. Attitude about using NFC-payment, when possible

Table 8: Variables Related To the Conceptual Framework

4.5.4.2. Questionnaire Translation

The translation was done from the English version to the Arabic version after following the guidelines provided by MAPI research trust. The survey items were translated into Arabic, and then back-translated into English. The results were compared with the original version and the differences were assessed and appropriate changes were made to keep the exact meaning of the intended message of the original version. The version was applied on ten of City Mall's customers to assess the ease of understanding. They were encouraged to report any difficulty that they have faced in understanding any of the items. Wherever the customers reported any difficulty, the issue was taken into consideration and the needed modifications were applied. Finally, the version of the Arabic questionnaire was created. This final version was used in this study.

4.5.5. Pilot test

In general, a pilot study is always a good idea in order to make sure that the questions in the questionnaire were clear and free from ambiguity. Therefore, a pilot test was done to assess the questionnaire for functionality in paper format. This assessment was anticipated to eliminate any instrument error and to enable the participants to complete the questionnaire without incident.

After performing the pilot test of both the English and Arabic versions of the questionnaire, some corrections were done for a better understanding of the questionnaire items.

4.5.6. Sample

The total number of responses is 214 of whom 104 (49.1%) were males as opposed to 108 (50.9%) females (see Figure 21).

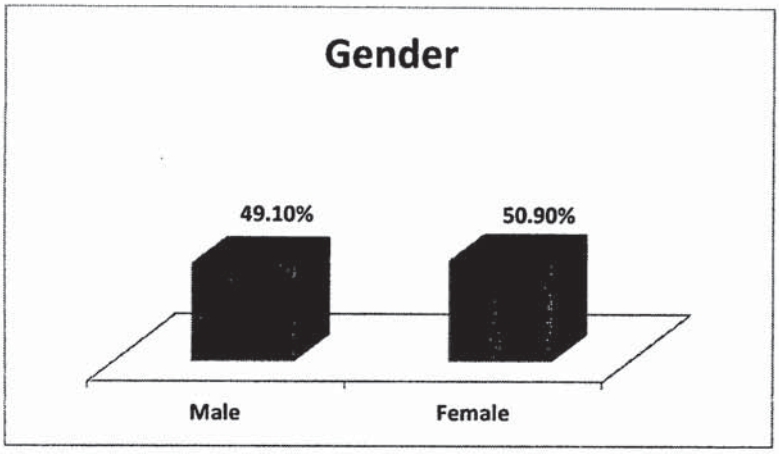

Figure 21: Gender

In terms of education level, 114 (53.8%) said they had a university (BA) and another 61 (28.8%) said they had a university degree (above BA). Pre-secondary 11 (5.2 %) and those with no formal education were only 2 (0.9 %). Judging by what respondents said; 81.8% of the sample has received formal education. Details of the breakdown are shown in Figure 22.

The results below are somehow reasonable since the survey was held in a big supermarket in the Matn area where most of the people who shop there have reputable jobs and fixed income dedicated for supermarkets shopping. In addition, educated individuals are presumably more interested in following new technologies and have the ability to understand it and grab its idea faster than non-educated ones.

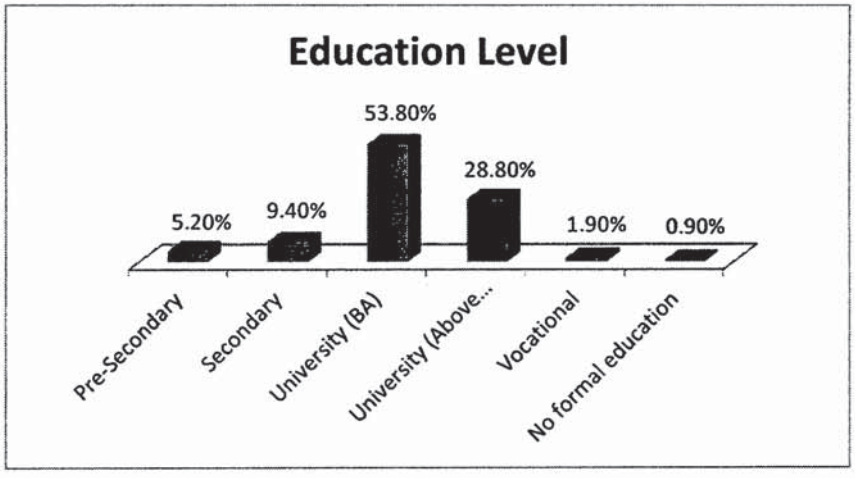

Figure 22: Education Level

The majority of respondents' occupation 65 (32%) was in business, followed by information technology n = 52 (25.6%). The lowest is for maintenance, translation and secretary with only 2 for each (0.9%). See Figure 23.

This result is due to the trend people are taking in their lives. Business and information technology are nowadays booming and touching people's lives. These two major things are very wide and interfere in all kind of companies and jobs.

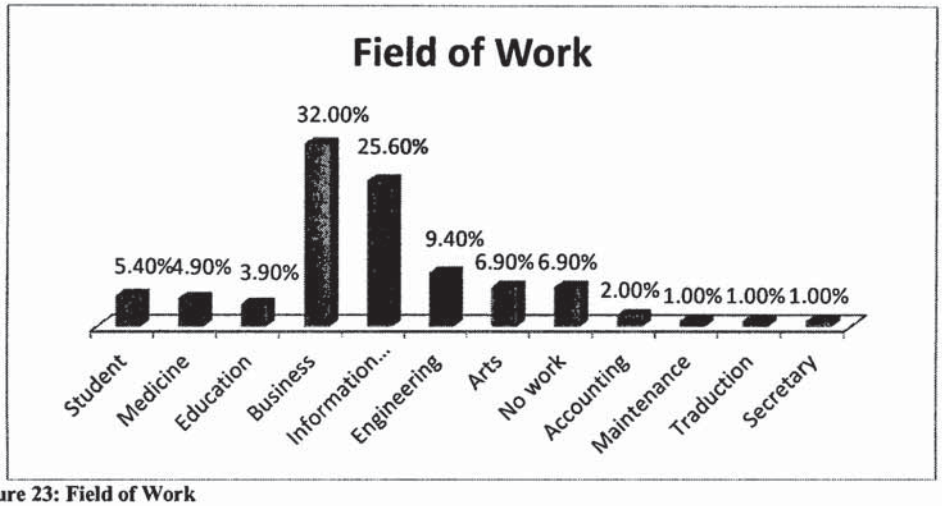

Figure 23: Field of Work

In terms of district, the majority of respondents came from Baabda and Matn with 51 (25.5%) from Baabda, 66 (33%) from Matn and the rest came from different areas. The highest response rate was from Matn since City Mall is situated in the Matn area and mostly visited by customers situated in the nearby vicinity (See Table 9 below).

District	n	%
Beirut	34	17
Baabda	51	25.5
Aley	3	1.5
Matn	66	33
Keserwan	31	15.5
Chouf	1	0.5
Jbeil	4	2
Akkar	3	1.5
Bsharri	2	1

Batroun	1	0.5
Zahle	1	0.5
Jezzine	1	0.5
Nabatiyeh	1	0.5
Marjeyoun	1	0.5

Table 9: District

Table 10 shows that the mean age of the respondents was 31 i.e., were young.

Since City Mall is a place where all kinds of shopping can be done (clothes, accessories, shoes, etc…), watch movies and shop in the grocery store; it is sort of targeted to young people. Besides, young people have more intention to learn about new technologies and have the ability to grab this kind of information with trust and will to apply it.

	n	Minimum	Maximum	$\overline{X}$	Std.
Age	210	15	68	31.28	10.465

Table 10: Age

4.5.7. Data Collection Process

The data were collected through direct surveys with City Mall's customers. First of all, after giving a brief explanation of the different use of NFC, the participants signed a consent form prior to filling the questionnaire. During the completion of the survey, the participants were able to ask questions for clarifications. At the end, participants were thanked for their time.

The responses from completed forms were used for data analysis.

4.5.8. Data Analysis

The quantitative data were entered into the Statistical Package for Social Sciences (SPSS) to determine the respondents' perception towards accepting or rejecting NFC in the grocery store in City Mall. The analysis of the hypothesis could be conducted

using parametric or non-parametric tests. Initially, non-parametric test of Kruskal-Wallis test and Mann-Whitney (2) samples were considered. Nevertheless, since parametric tests are more powerful than non-parametric ones[2], therefore an independent t-test for dichotomous independent variable was considered and a One-way Analysis of Variance (ANOVA) was considered for independent variables having more than two categories.

Anova test was used after applying Leven's test for homogeneity of variance and finding that the data did not violate the use of parametric testing[3].

4.5.9. Validity and Reliability

Recognizing the aim of the study and knowing the consistency of the measurements, is the best way to be certain that the survey results were reliable. Validity and reliability were the best methods to control this issue.

Validity of the research is one of the most important aspects that determine its trustworthiness and refers to the extent to which a research evaluates the exact concept that is being measured. However, reliability depends on the precision of the measuring instruments.

A discrete analysis on each scale was performed using factor analysis with varimax rotation and eigen-cut value of 1.

In order to measure the reliability of the survey instrument, it was assessed based on Cronbach alpha[4] (Crombach, 1961) test for convergence to check the correlation of the questions. A Cronbach alpha of 0.7 is considered to be acceptable and the higher it is, the better the internal consistency is.

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[2] http://www.mayo.edu/mayo-edu-docs/center-for-translational-science-activities-documents/berd-5-6.pdf

[3] http://www.itl.nist.gov/div898/handbook/eda/section3/eda35a.htm

[4] http://www.ijme.net/archive/2/cronbachs-alpha.pdf

Cronbach's alpha internal consistency measurement is introduced in the Table 11 below.

Cronbach's alpha	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.8 \leq \alpha < 0.9$	Good
$0.7 \leq \alpha < 0.8$	Acceptable
$0.6 \leq \alpha < 0.7$	Questionable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

Table 11: Cronbach alpha internal consistency

The Cronbach alpha of the first determinant "Willingness to adapt NFC technology" is equal to 0.77 which is acceptable. Moreover, the Cronbach alpha of the second determinant "The future of NFC" was equal to 0.80 which is considered to be good.

However, there was a problem with the third determinant which had a Cronbach alpha of 0.36 and considered to be unacceptable. This might be caused by the existence of a negative statement in the questions. Therefore, this statement "I will not use NFC if my friends or relatives have security concerns regarding NFC" was transformed to a positive one "I will use NFC if my friends or relatives have security concerns regarding NFC" by recoding. But still Cronbach alpha was poor with a value equal to 0.56.

As for the fourth determinant "Benefits and advantages of NFC", its Cronbach alpha was acceptable with a value of 0.78.

Whereas, the fifth determinant "Easiness of NFC", had a Cronbach alpha of .53 before recoding the question "I will not use NFC if it is hard to learn" into a positive one. After performing the recoding, this determinant's Cronbach alpha unexpectedly decreased to .34. After eliminating this question from the survey, the reliability level increased to .66 which is considered to be questionable.

The fifth determinant "Attitude about using NFC–payment, when possible" included also a negative question and therefore had a Cronbach alpha of .44 which is

unacceptable. After recoding the negative question "I will never use this technology", the reliability increased to .56 which is poor. However, after removing this question from the survey, the reliability increased to .62 which is questionable.

Finally, the sixth determinant "Major security threats" had a Cronbach alpha of .88 which is good.

In the below Table 12, a summary of the survey instrument reliability measured by determinant is shown.

	Reliability	
Variable	No. items	Cronbach's alpha
Willingness to adapt	3	.77
Future of NFC	3	.80
Subjective norms	3	.56
Opportunities and gains	4	.78
Ease of use	4	.66
Attitude about using NFC-payment	4	.62
Security threats	4	.88

Table 12: Survey instrument reliability measures by determinant

4.6. Conclusion

This approach in this study used a survey research design, using questionnaire (quantitative) instruments to gather consumers' perception towards the acceptance or rejection of NFC in the grocery store in City Mall. Participants were selected from the customers of City Mall. Data analysis included the preparation of descriptive statistics and a test of correlation.

The chapter that follows will discuss the findings and results of the survey.

Chapter 5. RESULTS AND FINDINGS

5.1. Introduction

To recap, the purpose of this thesis is to evaluate reasons for adopting NFC in the grocery store in City Mall. The research goal is to find the factors that will affect consumers whether to accept or reject this technology in City Mall.

These results have the potential to lay a foundation for further research in the adoption of NFC. The benefit to society is an increase understanding of the different use and application of this new technology.

This chapter is set to describe and discuss the survey findings and examine the statistical tests performed. The results of findings obtained and analyzed from fieldwork were divided into eight sections:

1. Data Cleaning
2. Sample
3. Descriptive Statistics
4. Factor Analysis
5. Main Results
6. Discussion of the findings
7. Discussion of the hypothesis
8. Conclusion

These sections will be discussed in sequence in the sections set forth

5.2. Data Cleaning

The first step before starting with the analysis of the results is to check for mistakes or invalid data entered into the Statistical Package for the Social Sciences (SPSS). The purpose of data cleaning was to correct possible data entry errors in order to minimize their effect on the study results.

This step is done using frequency data distribution. After identifying the surveys in which the errors were found, correction was done by going back to the hard copies

using the reference on each one to recognize the specified surveys. After correcting data entry; a check for extreme cases was done. For example, a respondent entered his age as being equal to 1. These extreme cases were removed from the sample.

The following section will describe the results of each variable.

5.3. Descriptive Statistics

The descriptive statistics for the different variables or concepts addressed in the survey are listed in the charts (Figure 25, Figure 26, Figure 29, Figure 30, Figure 31, Figure 32, Figure 33, Figure 34, Figure 35, Figure 36, Figure 37, Figure 38, Figure 36, Figure 37, Figure 38). For full responses see APPENDIX E.

As shown in Figure 24 below, 87 (40.8%) of the respondents usually shop in the same place; whereas 56 (26.3%) of them do not. However 70 (32.7%) of the respondents reported they shop from time to time in the same place.

Usually, individuals like to shop in the same place because it is easier for them to find the products they need to buy. However, sometimes they shop in different places based on the location of the supermarket, diversity in brands, products offers and discounts.

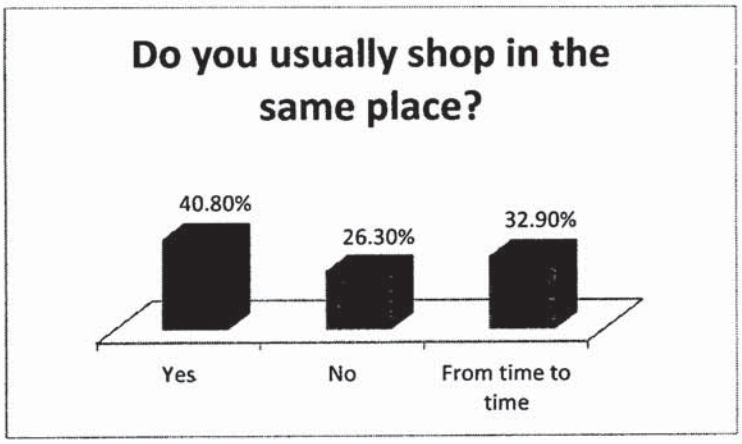

Figure 24: Do you usually shop in the same place?

It can be noticed that respondents shop in supermarkets between 1 to 4 times per month. The highest three are: 79 (37.1%) shops 1 or 2 times, 55 (25.8%) shops 2 or 3 times and 43 (20.2%) shops 3 or 4 times. However, the lowest two are: 19 (8.9%) shops less than once and 17 (8%) shops more than 4 times per month (See Figure 25 below).

Because time is very critical nowadays, most individuals try to do their bulk of shopping once. This could be the reason that 1-2 times had the highest ranking.

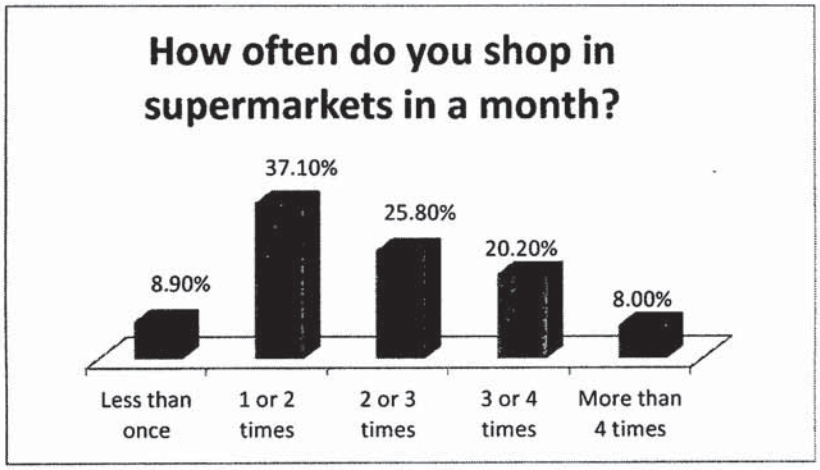

Figure 25: How often do you shop in supermarkets in a month?

Most of the people spend from half an hour to 2 hours while shopping. Referring the Figure 26 below, 83 (39%) of the respondents spend from half an hour to 1 hour while shopping, 63 (29.6%) spend from 1-2 hours, 34 (16%) spend from 2-3 hours, 27 (12.7%) spend less than half an hour and 6 (2.8%) spend more than 3 hours.

Figure 26: Time spent while shopping

Most of the people are sometimes having problem finding store representatives to help them while they are shopping. Referring the Figure 27 below, 96 (45.1%) of the respondents said that sometimes they are having trouble with finding store representatives in the supermarket, 51 (23.9%) agreed with this statement, while 66 (31%) disagreed.

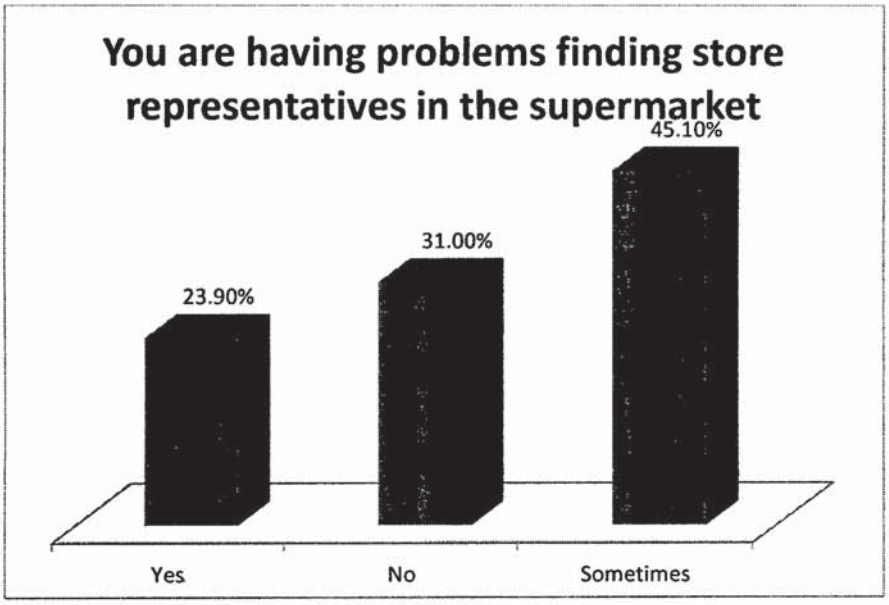

Figure 27: You are having problems finding store representatives in the supermarket

Most of the people sometimes find that store representatives don't have enough product knowledge to assist them. Referring the Figure 28 below, 117 (54.7%) of the respondents said that sometimes they find that store representatives doesn't have enough product knowledge to assist them, 53 (24.8%) agreed with this statement, while 44 (20.6%) disagreed.

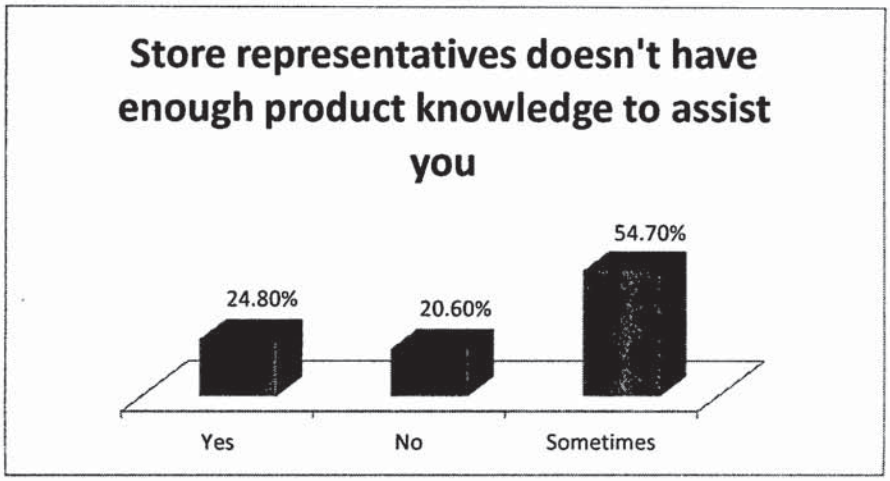

Figure 28: Store representatives doesn't have enough product knowledge to assist you

It can be noticed that cash is the most preferred payment method. One hundred and forty seven respondents constituting 68.7% of the sample prefer cash, 65 (30.4%) prefer credit card and only 2 (0.9%) prefer check (see Figure 29 below). Cash had the highest ranking maybe because people have security concerns regarding payment using credit cards.

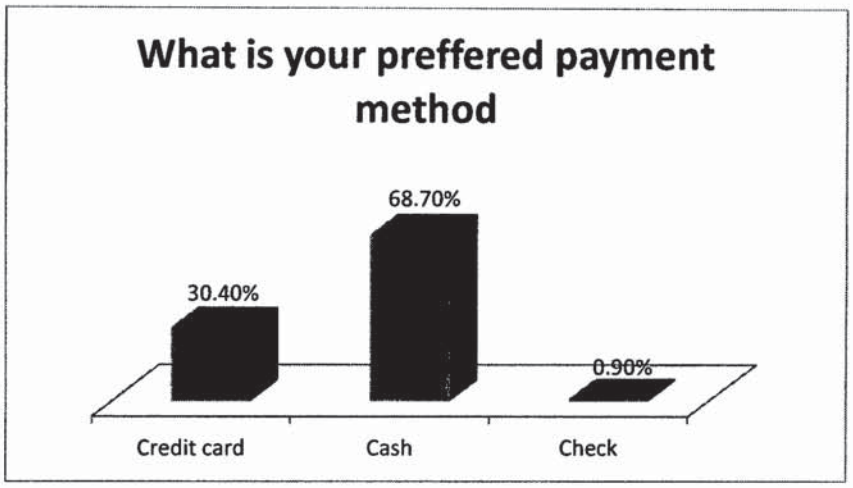

Figure 29: What is your preferred payment method

Most people (36.4%) spend from 100$ to 199$ each time they shop. 78 (36.4%) spend from 100$ to 199$, 60 (28%) spend from 50$ to 99$, 33 (15.4%) spend less than 50$, 30 (14%) spend from 200$ to 300$ and the rest 13 (6.1%) spend more then 300$ (see Figure 30 below).

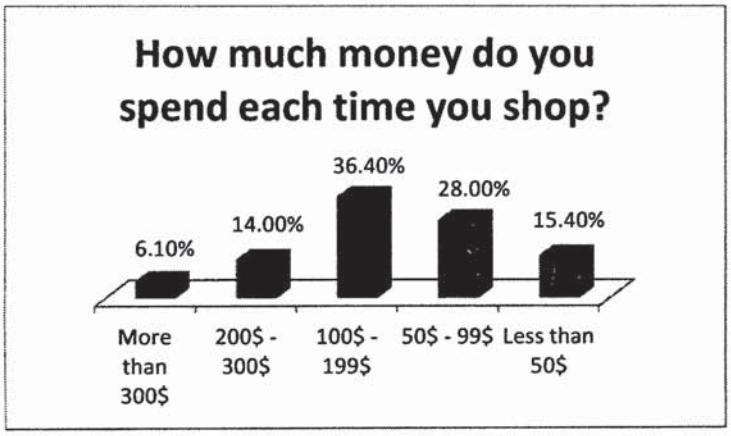

Figure 30: How much money do you spend each time you shop?

Here we can find the surprising results where only 57 (26.8%) have NFC in their mobiles and 156 (73.2%) do not and have to buy a new one if they want to use NFC in City Mall (see Figure 31 below).

NFC is still not used in Lebanon and not included in all mobiles. Therefore customers do not look for this option when buying a new phone.

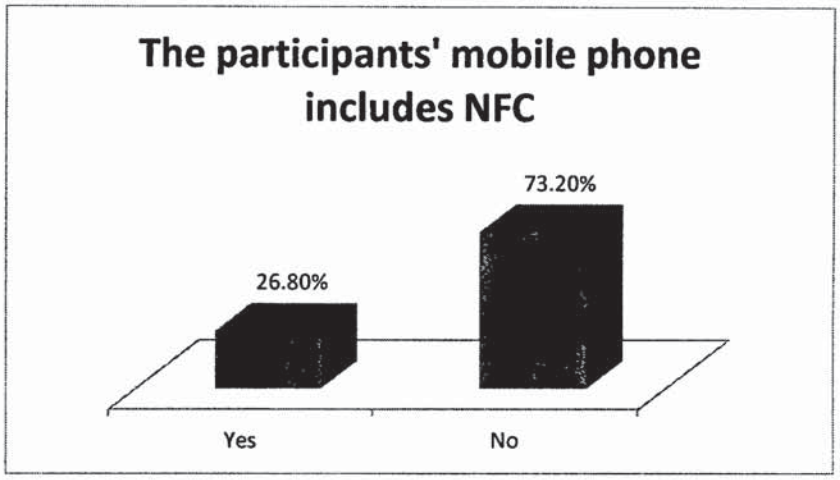

Figure 31: The participants' mobile phone includes NFC

As seen in the Figure 32 below, almost the half of the respondents change their cell phone once every 2 years. One hundred and one constituting 47.2%) of respondents change their cell phone once every 2 years, 53 (24.8%) change their cell phone one per year and 46 (21.5%) one every 3 years. A very small number of respondents change their cell phone more than once per year, where only 2 (0.9%) three times per year and 6 (2.8%) twice per year and more than three times per year.

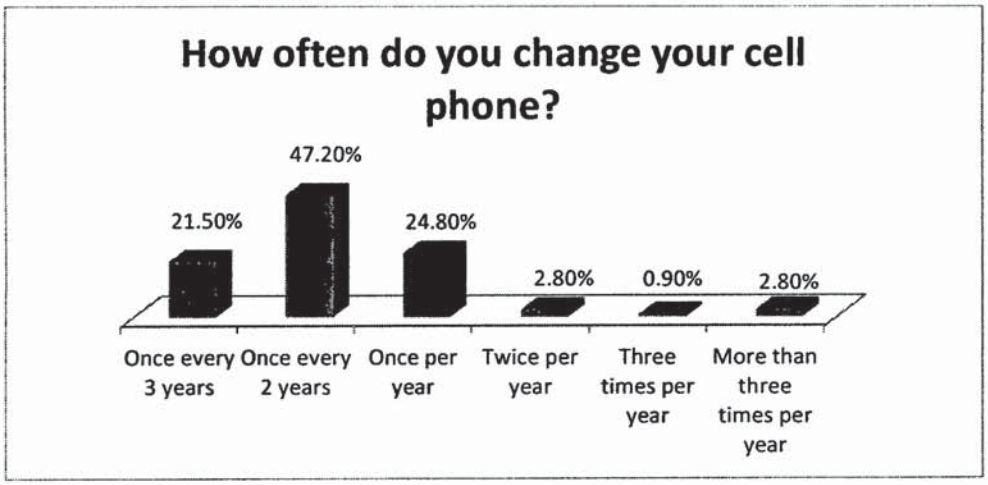

Figure 32: How often do you change your cell phone?

It is noticed in Figure 33 that peer pressure is the least variable that affects users to change their cell phone however new features in cell phone is the highest determinant factor. Where 86 (40.6%) are affected by the new features, 54 (25.5%) change their cell phone because it is broken, 52 (24.5%) because it is old, 17 (8%) because it is stylish and 3 (1.4%) because of peer pressure.

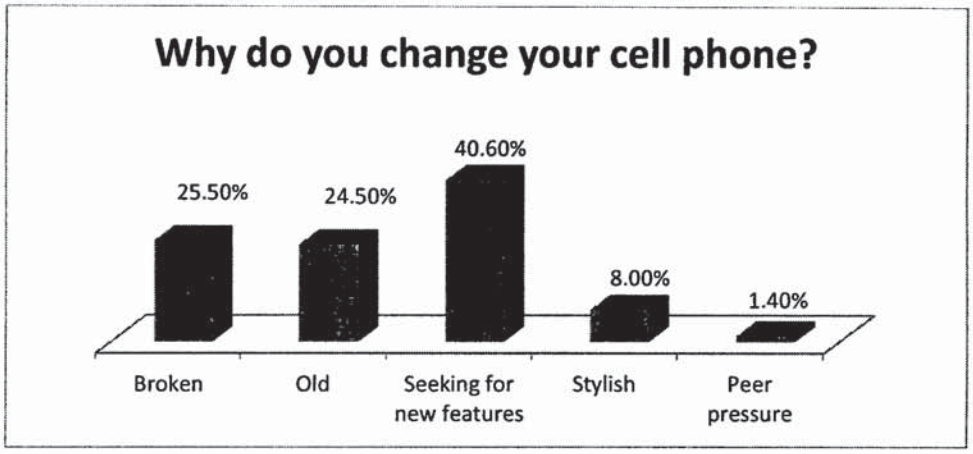

Figure 33: Why do you change your cell phone?

Most peoples' budget when buying a new cell phone is between 500$ - 500$ and 300$ - 399$. Forty (18.8%) of respondents pay between 300-399 while 39 (18.3%) said they pay between 500-499. A small percentage of people have a budget less than 200$ (see Figure 34 below).

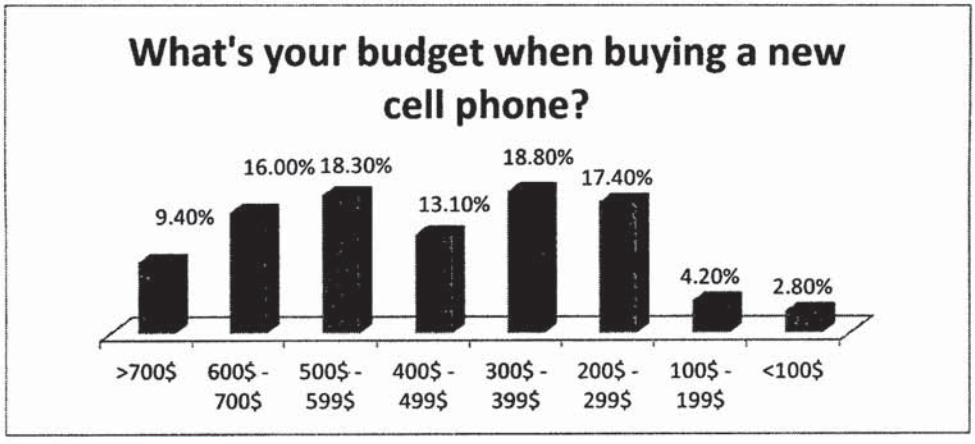

Figure 34: What's your budget when buying a new cell phone?

The two most preferred supermarkets are Charcutier Aoun and City Mall. Charcutier Aoun is ranked to be the first maybe because it has lots of branches and can be easily accessible. The least two preferred supermarkets are Bou Khalil and Metro (see Figure 35).

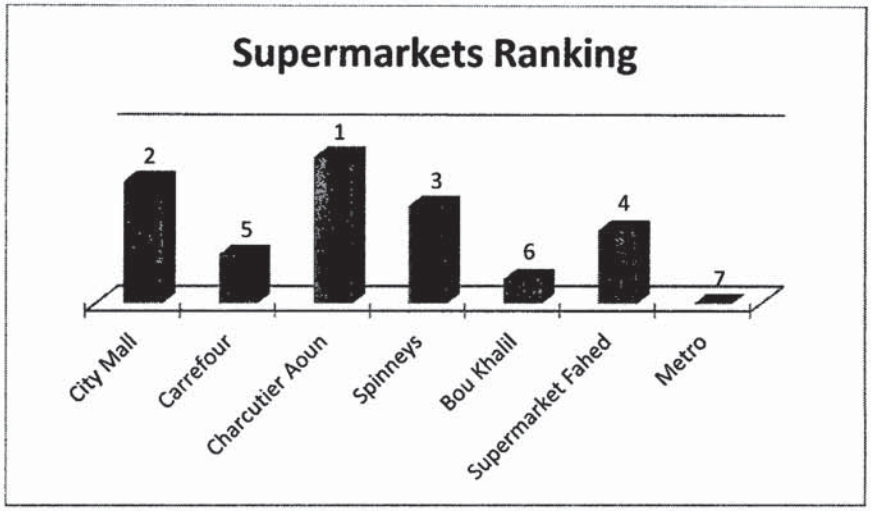

Figure 35: Supermarkets Ranking

The most three important characteristics to prefer shopping in supermarket A rather than supermarket B are: Location, hygiene and lower items' price. However, the least three are: Size, number of cashier and number of store representatives (See Figure 36).

Figure 36: Shopping in specific supermarket depends on

As shown in Figure 37, features in a cell phone are the most important characteristic that a person looks for when buying a new cell phone and brand name is the least important one after the price. Appearance is the third most important one which comes after the user friendly characteristic.

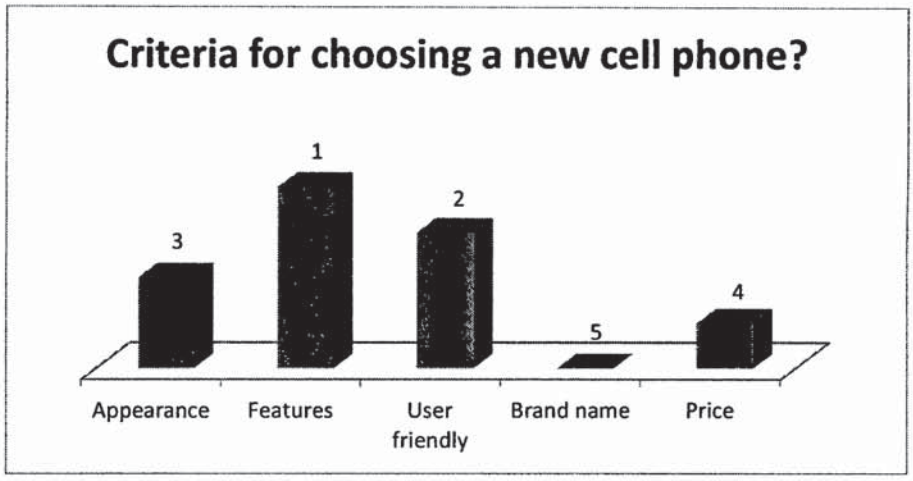

Figure 37: Criteria for choosing a new cell phone?

It can be noticed in Figure 38 that most respondents use their mobiles to make phone calls and for social networking. The least two utilized features in mobiles are reading news and video streaming.

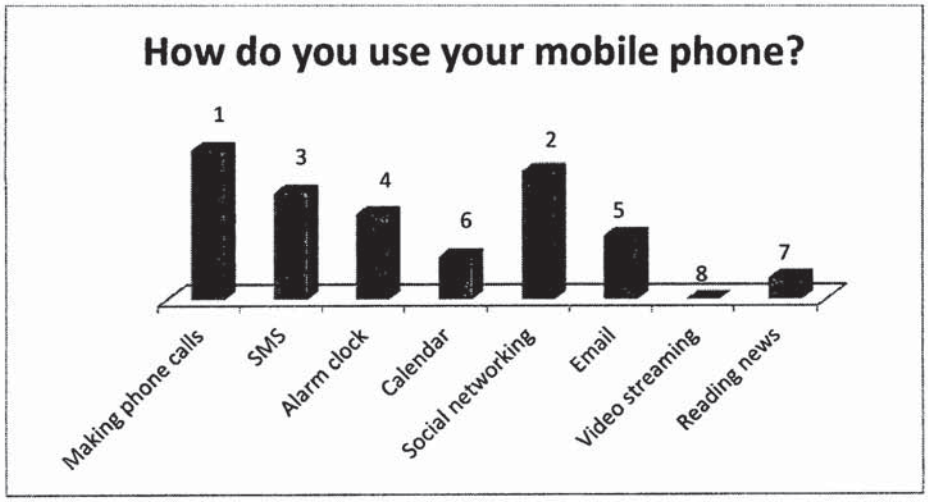

Figure 38: How do you use your mobile phone?

In the Table 13 that follows, a detailed result of the respondents' responses for each question is found.

1. Willingness to adapt NFC technology:
    a) The majority of the respondents (52.7%) were positive towards the usage of their Smartphone as their wallet, however only 20.6% were against it.
    b) Respondents had equal attitude towards storing their credit cards details on their cell phone.
    c) Respondents with neutral and positive willingness to buy a new phone if their cell phone doesn't have NFC are more than the unwilling ones.
2. The future of NFC:
    a. The minority of the respondents (8.9%) disagreed that NFC will accelerate the checkout process in the supermarket. However 67.7% stated that they find NFC useful for the speeding up the checkout process.
    b. Almost half of the respondents were interested to use NFC in other supermarkets with 52.3% positive attitude and 14.6% negative attitude.
    c. More than half the respondents agreed that most people will be likely using NFC in the future.
3. My peers perception towards using NFC influences my behavior:
    a. Almost equal response rate existed for the question "I will use NFC if my friends or relatives use it" where the highest response rate was neutral. This means that respondents were almost equally affected by their friends or relatives decisions whether to adopt NFC or not.
    b. Respondents that are not affected or neutral about the effect of their friends or relatives security concerns on their decision to adopt NFC are equal. However, respondents that are affected by their friends or relatives concerns constituted a smaller share.
    c. Almost half of the respondents agreed that they will use NFC if their friends or relatives find it useful. A small portion of the respondents said that they are not affected by their friends or relatives' attitude towards NFC.

4. Benefits and advantage of NFC:
    a. More than half of the respondents (59.5%) find that storing their credit cards, tickets and coupons on their cell phone saves them from carrying several cards in their wallet. However, only 17.1% of the respondents didn't find NFC as being useful in this case.
    b. More than half of the respondents (60.4%) find that storing their credit cards, tickets and coupons on their cell phone saves them from losing some cards. However, only 15.2% of the respondents didn't find NFC as being useful in this case.
    c. The majority of the respondents (71.9%) find that NFC will increase the speed of payment however only 7.6% disagreed.
    d. More than half of the respondents (58.5%) stated that NFC will help them better select the products they want to buy and only 12.4% disagreed with this statement.
5. Easiness of NFC:
    a. A big part of the respondents (79.6%) said that they can easily adapt to a new technology however only 7.6% said that they finds it difficult. This is probably because the majority of the respondents were young with $\bar{X} = 31$ and everything nowadays is running towards new technologies and innovations.
    b. Positive and negative attitudes towards the use of NFC if it is hard to learn were almost equal with a small portion of the population (26.8%) were neutral towards this statement.
    c. A big share of the respondents (66.5%) agreed that they will use NFC if it is simple, however only 10.6% disagreed.
    d. A large portion of the respondents (80.4%) agreed that they will use NFC if it is quick, nevertheless only 4.3% disagreed.
6. Attitudes about using NFC-payment, when possible:
    a. Half of the respondents agreed that they want to use NFC as soon as it is possible, nonetheless only 13.8% disagreed.
    b. Only 8.6% of the respondents said that they will never use NFC whereas more than half of the respondents (62.8%) were positive towards using NFC.

c. More than half of the respondents (63.8%) agreed that they will use NFC if it gives the discount, however only 8.1% disagreed.
d. More than half of the respondents (66.2%) agreed that they will use NFC when they do not have cash or debit card. However, only 10.9% disagreed.
e. More than half of the respondents (63.4%) agreed that they will use NFC when they are in a hurry. However, only 9% disagreed.

7. Major security threats:
   a. More than half of the respondents (63%) agreed that eavesdrop is a major security threat, however only 4.8% disagreed. Thirty two point three percent were neutral about this question since a large number of people do not have enough knowledge about NFC and its security threats.
   b. Concerning data modification threats, more than half of the respondents (67.3%) agreed that it is a major security threat. However, only 4.4% disagreed.
   c. Concerning data corruption threats, here also more than half of the respondents (68.2%) agreed that it is a major security threat. However, only 6.2% disagreed.
   d. Almost third quarter of the respondents agreed that interception of a third party is a major security threat. Nonetheless, only 4.8% disagreed.

Item	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	n	%	n	%	n	%	n	%	n	%
1) Willingness to adapt NFC technology										
1. I'm in favor of using my Smartphone as my wallet	11	5.3	32	15.3	56	26.8	85	40.7	25	12
2. I'm okay with storing my credit cards details on my cell phone	21	9.9	55	25.9	51	24.1	70	33	15	7.1
3. If my phone doesn't have NFC, I am willing to buy a new one	14	6.6	37	17.4	85	39.9	58	27.2	19	8.9
It can be concluded that people had a positive attitude towards using NFC. They are willing to use their Smartphone as their wallet, do not mind storing their credit card details on their cell phone and most importantly are willing to buy a new cell phone if theirs doesn't have NFC.										
2) The future of NFC										
4. NFC will accelerate the checkout process in the supermarket	6	2.8	13	6.1	50	23.5	116	54.5	28	13.1
5. I am interested to use NFC in other supermarkets	7	3.3	24	11.3	70	33	87	41	24	11.3
6. Most people will be likely using NFC in the future	3	1.4	11	5.2	66	31	105	49.3	28	13.1
Respondents find that NFC will have a future in the market. They find it useful since it will accelerate the checkout process and think that it will be adapted by lots of people.										
3) My peers perception towards using NFC influences my behavior										
7. I will use NFC if my friends or relatives uses it	16	7.5	54	25.5	77	36.3	57	26.9	8	3.8
8. I will not use NFC if my friends or relatives have security concerns regarding NFC	6	2.9	72	34.3	78	37.1	42	20	12	5.7
9. I will use NFC if my friends or relatives finds it useful	9	4.3	33	15.7	71	33.8	88	41.9	9	4.3
It can be noticed that respondents are not affected by subjective norms when talking about the adoption of NFC.										

Table 13 Continued: Consumers' attitudes towards using NFC in City Mall

Item	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	n	%	n	%	n	%	n	%	n	%
4) Benefits and advantage of NFC										
10. Storing my credit cards, tickets and coupons on my cell phone saves me from carrying several cards in my wallet	12	5.7	24	11.4	48	22.7	98	45.8	29	13.7
11. Storing my credit cards, tickets and coupons on my cell phone saves me from losing some cards	7	3.3	25	11.9	51	24.3	95	45.2	32	15.2
12. Using NFC will increase the speed of payment	5	2.4	11	5.2	43	20.5	118	56.2	33	15.7
13. NFC will help me to better select the products I want to buy	8	3.8	18	8.6	61	29	91	43.3	32	15.2
More than half of the respondents were positive about this point. They think that NFC has many benefits and advantages such as: It will save them from carrying several cards in their wallet, it will also save them from losing their card; it will increase the speed of payment and help them to better select the products they want to buy.										
5) Easiness of NFC										
14. I can easily adapt to a new technology	7	3.3	9	4.3	27	12.8	127	60.2	41	19.4
15. I will not use NFC if it is hard to learn	11	5.3	70	33.5	56	26.8	56	26.8	16	7.7
16. I will use NFC if it is simple	2	1	20	9.6	48	23	110	52.6	29	13.9
17. I will use NFC if it is quick	0	0	9	4.3	32	15.3	125	59.8	43	20.6
The majority of the respondents said that they can easily adapt to a new technology, however they agreed that they will not use NFC if it is hard to learn, not simple and not quick.										

Table 13 Continued: Consumers' attitudes towards using NFC in City Mall

6) Attitude about using NFC-payment, when possible										
18. I want to use it as soon as the technology is possible	5	2.4	24	11.4	83	39.3	79	37.4	20	9.5
19. I will never use this technology	36	17.1	96	45.7	60	28.6	12	5.7	6	2.9
20. I will use it if it gives me discount	2	1	15	7.1	59	28.1	100	47.6	34	16.2
21. I will use it when I do not have neither cash or debit card	4	1.9	19	9	48	22.9	109	51.9	30	14.3
22. I will use it when I'm in a hurry	4	1.9	15	7.1	58	27.6	102	48.6	31	14.8
The majority of the respondents had a positive attitude about using NFC-payment when possible. Judging from the results above, the respondents were anxious about using NFC as soon as it is possible.										
7) Major Security Threats										
23. Eavesdropping	5	2.4	5	2.4	67	32.3	101	48.6	30	14.4
24. Data Modification	2	1	7	3.4	59	28.4	106	51	34	16.3
25. Data Corruption	4	1.9	9	4.3	53	25.5	102	49	40	19.2
26. Interception of a third party	5	2.4	5	2.4	50	23.9	100	47.8	49	23.4
A big percentage of people were neutral in this question, it could be because not everyone is familiar with this new technology and identifies its security threats.										

Table 13: Consumers' attitudes towards using NFC in City Mall

The section that follows summarizes the positive and negative outcomes that City Mall's customers reported from the questionnaire.

5.3.1. Summary of positive outcomes

The survey revealed that most of the respondents are willing to buy a new cell phone if the existing one doesn't have NFC. This is a good outcome for City Mall since 73.2 % of the respondents' mobile phone does not include NFC and will not be able to benefit from this option if they do not change their phone.

After checking the results, the majority of the respondents showed interest in using NFC for the benefits and facilities that it can offer once implemented in the grocery store in City Mall. Respondents found that NFC can accelerate the checkout process in the supermarket by increasing the speed of payment and can also help them in better selecting the products they want to buy by having all the needed information about them. Furthermore, they also found that storing credit cards, tickets and coupons on their Smartphone can save them from carrying several card in their wallet, in addition to preventing them from losing some cards.

The majority of the respondents were enthusiastic about using this technology as soon as it is possible. In addition, they are interested to use it in other supermarkets and believe that NFC has a potential and that most people will be using it in the future. Moreover, some of them will use it if it offers discount, when they are in hurry or when they do not have cash or debit card. However, some of the respondents were affected by subjective norms and said that they will use NFC if their friends or relatives finds it useful.

Several respondents had some conditions to use NFC. They are affected by its easiness for learning and will use it if it is simple and quick.

5.3.2. Summary of negative outcomes

The most significant part where respondents were negative is towards NFC security threats. A very large portion of the respondents had fear regarding NFC's security threats such as: Eavesdropping, data modification, data corruption and interception of a third party. Despite the fact that half of the respondents are educated, this technology is at the very beginning of its maturity and a small share of the population is aware of its security threats.

To conclude, major security threats is the consumers major concern about using NFC since they are paying online and thus their transactions could be threatened. In addition, NFC is a new emerging technology and not all the individuals have knowledge about it; hence, they will definitely fear this issue.

5.4. Hypothesis 1

As already stated in section 1.7 of Chapter 1; the hypothesis 1 that this research paper seeks to test is:

> "Variables extracted from multiple technology theories employed in this study will yield new dimensions emerging from the Lebanese context."

There are eight independent variables: transition cost, security effectiveness, subjective norms, opportunities and gains, ease of use, age, gender and educational level; and one dependent variable: adoption.

Since multiple questions were asked about each of the independent and dependent variables, data reduction was necessary. In order to prepare for the regression analysis and ANOVA, data reduction was completed using a principle component factor analysis[5] with varimax rotation and eigen cut off value of one. Items loading above 0.3 were considered a loading in that factor. Factor analysis results yielded 7 factors of which the first 4 factors were accounted for because they explained the largest variance in the data.

The first factor loaded 26% variance and was named "NFC opportunities and advantages". The second loaded 11.6% and was named "NFC security threats." The third with 7.8% was named "NFC usefulness or trend." And the last factor with 5.8% of the variance in the data was named "NFC adaptability."

The results of the principle component analysis are found in the Table 14 below.

	NFC opportunities and advantages	NFC security threats	NFC Usefulness or trend	NFC adaptability	H^2
I'm in favor of using my Smartphone as my wallet	X				.554
I'm ok with storing my credit cards details on my cell phone	X				.532
If my phone doesn't have NFC, I am willing to buy a new one	X				.669
NFC will accelerate the checkout process in the supermarket	X				.684

[5] http://www.yorku.ca/ptryfos/f1400.pdf

I am interested to use NFC in other supermarkets	X				.764
Most people will be likely using NFC in the future	X				.518
I will use NFC if my friends or relatives uses it			X		.631
Storing my credit cards, tickets and coupons on my cell phone saves me from carrying several cards in my wallet	X				.645
Storing my credit cards, tickets and coupons on my cell phone saves me from losing some cards	X				.578
Using NFC will increase the speed of payment	X				.539
NFC will help me to better select the products I want to buy	X		X		.534
I can easily adapt to a new technology				X	.703
I will not use NFC if it is hard to learn					.738
I will use NFC if it is simple					.786
I will use NFC if it is quick				X	.748
I want to use it as soon as the technology is possible	X			X	.512
I will never use this technology					.486
I will use it if it gives me discount			X		.569
I will use it when I do not have neither cash or debit card			X		.656
I will use it when I'm in a hurry	X		X		740
Eavesdropping		X			.645
Data Modification		X			.761
Data corruption		X			.727
Interception of a third party		X			.797

Table 14: Principle component analysis with Varimax rotation

5.4.1. NFC opportunities and advantages

The results of the factor analysis from the NFC opportunities and advantages questions revealed significant correlations between the 12 below concepts:

- I'm in favor of using my Smartphone as my wallet
- I'm ok with storing my credit cards details on my cell phone
- If my phone doesn't have NFC, I am willing to buy a new one
- NFC will accelerate the checkout process in the supermarket
- I am interested to use NFC in other supermarkets
- Most people will be likely using NFC in the future
- Storing my credit cards, tickets and coupons on my cell phone saves me from carrying several cards in my wallet
- Storing my credit cards, tickets and coupons on my cell phone saves me from losing some cards
- Using NFC will increase the speed of payment
- NFC will help me to better select the products I want to buy
- I want to use it as soon as the technology is possible
- I will use it when I'm in a hurry

As pointed out above, most of the individuals are observing the opportunities and advantages of using NFC in the grocery store in City Mall and hence are willing to switch from using their old mobiles and buy a new one that is NFC enabled in order to be able to exploit and use this new innovative technology.

Furthermore, individuals are in favor of using their Smartphone as their wallet and do not have a problem with storing their credit card details on their cell phone since it can help in increasing the speed of payment which will accelerate the check-out process in the grocery store. Moreover, using their Smartphone as their wallet will save them carry several cards in their wallet that might be lost.

In addition to the above benefits, NFC will increase the customers' product knowledge which will help them to better select the products they want to buy.

The next analysis shows the security threats of NFC.

5.4.2. NFC security threats

As for the results of the factor analysis from the NFC security threats questions, they revealed significant correlations between the 4 below concepts:

- Eavesdropping
- Data modifications
- Data corruption
- Interception of a third party

Eavesdropping is when an illegal personnel "spy" on a transaction to gather information. NFC can prevent eavesdropping using two techniques. First, NFC transactions are preformed through a short distance of maximum 4 centimeters which makes it very hard for any personal to intercept the signals. In addition, transactions are done through a secure channel with encrypted information and only an authorized device can decode it (Kazmi, 2011).

Data modification occurs when an illegal personnel manipulates the information being sent so it is useless when it arrives to the reader. Secure channels prevent data modification to happen by stopping them before running.

Data corruption occurs when an illegal personnel interferes with the information being sent so it is corrupted when it arrives to the reader. Secure channels also prevent data corruption to happen by stopping them before running.

Interception of a third party is similar to data manipulation. But here, the personnel operate as a middleman between the two devices and collect and modify the data as it passes between them. To avoid this type of thread, devices should operate in an active-passive pairing.

Security is a very important issue in NFC since payment can be done using it and therefore we are dealing with sensitive information. All the above threats are solved because the devices communicate through a short distance in addition to the secure channels. However, this technology is new and few people have enough knowledge about its security and therefore have concerns towards this issue.

5.4.3. NFC Usefulness or trend

The results of the factor analysis from the NFC usefulness or tend questions revealed significant correlations between the 5 below concepts:

- I will use NFC if my friends or relatives uses it
- NFC will help me to better select the products I want to buy
- I will use it if it gives me discount
- I will use it when I do not have neither cash or debit card
- I will use it when I'm in a hurry

Because NFC is a new technology, not deployed by any business nor used by any individual; adapting this technology will be a challenge for users.

Sometimes, individuals are affected by the choice of their relatives or friends whether to adopt a technology or not. From the above statistics, the results showed that the respondents were positively correlated with their friends or relatives' choice whether to use NFC in the grocery store in City Mall or not.

Most of the respondents believe that NFC has many advantages. It can save time by accelerating the checkout process and help them in better selecting the products they wants to buy. However, consumers' choice about using NFC is affected by whether NFC gives them discount or if they do not have cash or debit card.

5.4.4. NFC adaptability

The results of the factor analysis from the NFC adaptability questions revealed significant correlations between the 3 below concepts:

- I can easily adapt to a new technology
- I will use NFC if it is quick
- I want to use it as soon as the technology is possible

Seventy nine point 6 percent of the respondents said that they can easily adapt to a new technology and 80.4% will use NFC if it is quick. And since NFC is easy, fast and user friendly, City Mall's customers will not have a problem with adapting to it.

Furthermore, 46.9% wants to use NFC as soon as it is possible and only 13.8% were against using it.

To conclude, the new dimensions resulting from factor analysis are shown in the Figure 39.

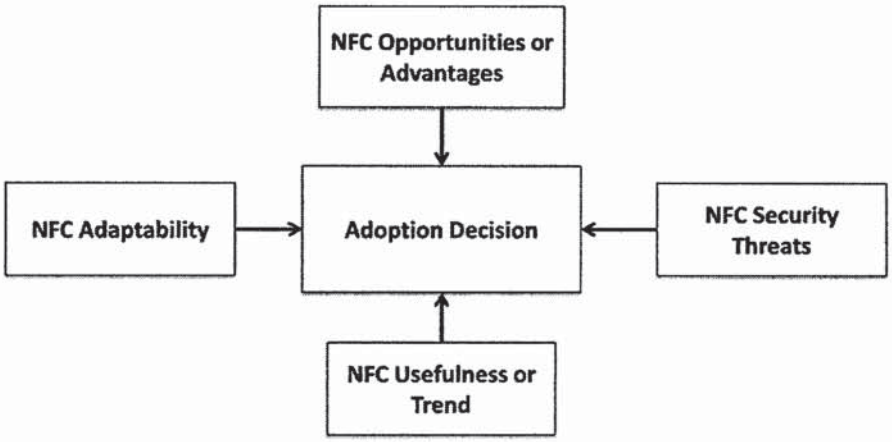

Figure 39: New Dimension of NFC model

Summary of Hypothesis 1
NFC opportunities and advantages
• Increase the speed of payment • Accelerate the checkout process • NFC will save customers from carrying several cards in their wallets • NFC will save customers from losing some of their cards • Help customers to better select the products they want to buy • Increase customers product knowledge
NFC security threats
• Eavesdropping • Data modifications • Data corruption • Interception of a third party
NFC Usefulness or trend

• Customers are affected by subjective norms
• Advantages
  o Helps in better selecting the products to buy
  o Accelerate the checkout process
• Will use it if it gives discount
• Will use it when there are no cash and neither debit card

NFC adaptability

- Customers can easily adapt to a new technology
- They will use NFC if it is quick
- They want to use it as soon as the technology is possible

Table 15: Summary of Hypothesis 1

5.5. Hypothesis 2

As already stated in section 1.7 of Chapter 1; the hypothesis 2 that this research paper is aiming to study is:

> "Because of different value systems nourishing respondents' attitude to technology (Teo, 2010), variations on the new emerging dimensions will be found based on respondents' gender and educational level."

In the following sections, a detailed analysis about the effect of gender and educational level on the consumer's acceptance of NFC in City Mall will be discussed.

5.5.1. Gender

Items loading high on a factor were summed up together and then divided by the number of items on that factor in order to obtain a mean score for each factor separately. Therefore, an independent t-test between gender and the four established dimensions was done. This test is accomplished in order to understand if there is a difference in any of the four dimensions based on gender.

Table 16 below, details the t-test for gender.

	Gender	N	$\bar{X}$	Std	t-values
NFC opportunities or advantages	Male	101	3.54	.66	1.22^{NS}
	Female	104	3.43	.62	1.22^{NS}
NFC security threats	Male	102	3.75	.77	$-.784^{NS}$
	Female	105	3.82	.66	$-.782^{NS}$
NFC usefulness or trend	Male	101	3.42	.69	-1.91^{NS}
	Female	106	3.59	.55	-1.90^{NS}
NFC Adaptability	Male	103	3.78	.68	$.91^{NS}$
	Female	105	3.70	.59	$.91^{NS}$

Table 16: t-test for gender

NS = Not Significant

As seen in Table 16, gender was not significant in the four dimensions: NFC Opportunities or advantages, NFC security threats, NFC usefulness or trend and NFC adaptability. Therefore, the alternative hypothesis which states that there will be gender variations on the four dimensions was rejected.

Gefen and Straub stated in 1997 that people's perceptions and behaviors are significantly affected by gender. Usually, women are more sensitive, nurturing and cooperative whereas men are more assertive and competitive which consequently might have an effect on their evaluation of a new technology (Gefen & Straub, 1997). However, the results of gender mean differences on consumer's acceptance of NFC in City Mall were not consistent with the findings of Gefen and Straub. These findings could be because both males and females will benefit from this innovation and since nowadays almost all women has a job; both men and women are involved together in the shopping experience to help each other. Consequently, regardless of the gender; respondents are interested to use a technology that can help them with their shopping and that can save them some time. In addition, these days women are more educated than before and has almost equal level of education as men, therefore both of them has interest in new technologies and new trends.

5.5.1.1. Gender and NFC opportunities or advantages

The results showed that there are no significant mean differences between males and females on the consumers' choice whether to use NFC in City Mall based on their perception towards NFC opportunities or advantages. Both males and females will use NFC if they perceive the opportunities and advantages that NFC can offer.

5.5.1.2. Gender and NFC security threats

Cazier et al. declared in 2007 that consumer's intentions to adapt a new technology is influenced by the privacy risk factors (Cazier, E., & B., 2007). In addition, in 1999, Hoffman stated that users are less likely to purchase online when they perceive that the online environment is risky. One the main reason behind this issue is that many consumers do

not have the knowhow about how their private data are being manipulated and used in the online environment (Hoffman, T., & M., 2004).

This research found that regardless of the gender, consumers have concerns towards NFC security threats. Since NFC is a new technology with a completely new environment where most customers are expected to be unfamiliar with, it might have some adoption issues.

5.5.1.3. Gender and NFC usefulness or trend

Many studies suggested that perceived usefulness of technology is more significant for men, whereas perceived ease of use is more important for females.

For example, Venkatesh et al. stated in 2000 that men focus on outcome when it comes to adopting a new technology, whereas women on ease of use (Venkatesh, 2000). Therefore, women's decision whether to adopt a new technology or not is highly affected by the difficulty of using it.

However, contrary to the results of previous studies (Venkatesh, 2000); this research found that men and women are both affected by the usefulness and trend of NFC in order to adopt this new technology. This might be due to the reason behind implementing NFC in the grocery store in City Mall. The main purpose of this implementation is to facilitate the shoppers' experience at City Mall by assisting them while they shop and by accelerating the checkout process. If NFC is not found as being useful then regardless of the gender, people will not be motivated to adopt it.

5.5.1.4. Gender and NFC adaptability

Many previous studies found that in general men are more likely to adopt new technologies than women (Doss & Morris, 2001) . This

result may be due to resource and time limitations that women often face.

This study found that regardless of the gender, men and female are both capable of adapting to NFC and are enthusiastic to use the technology as soon as it is available.

5.5.2. Educational level

To study the effect of educational level on the four established dimensions; one-way analysis of variance (Anova) for educational level was performed.

First of all, a recoding for the educational level was performed which reduced the number of possible answers from six to four. The recoding was done by categorizing the educational level to Pre-University instead of Pre-Secondary and secondary since both means that the respondent has no university degree; University and above university are still the same; and as for the vocational and no formal education, they were transformed to vocational given that they both means that the respondent is non educated. This recoding was done by dividing the cumulative percentage into four sections.

Below, you can see the modified highest education level attained Table 17.

		N	Valid Percent	Cumulative Percent
Valid	Pre-University	31	14.6	14.6
	University	114	53.8	68.4
	Above University	61	28.8	97.2
	Vocational	6	2.8	100.0
	Total	212	100.0	
Missing	System	2		
Total		214		

Table 17: Modified highest education level attained

University and vocational levels agreed that they will use NFC if they perceive its opportunities and advantages. However, university and above university and vocational levels had concerns related to the security of NFC. Nevertheless, university and vocational levels will use NFC if they perceive its usefulness or if

their relatives or friends use it. University and above university levels has no problem with adapting to NFC. The results are shown in Table 18.

		N	$\bar{X}$	Std.
NFC opportunities or advantages	Pre-University	30	3.25	.69
	University	110	3.57	.63
	Above University	59	3.45	.65
	Vocational	6	3.51	.16
	Total	205	3.48	.64
NFC security threats	Pre-University	31	3.59	.85
	University	110	3.83	.70
	Above University	60	3.80	.62
	Vocational	6	3.79	1.08
	Total	207	3.78	.72
NFC usefulness or trend	Pre-University	30	3.36	.70
	University	111	3.58	.61
	Above University	60	3.43	.63
	Vocational	6	3.76	.19
	Total	207	3.51	.63
NFC Adaptability	Pre-University	31	3.47	.76
	University	111	3.80	.64
	Above University	60	3.78	.50
	Vocational	6	3.66	.81
	Total	208	3.74	.64

Table 18: Anova test for educational level

Education level is believed to have a great significance in relation to attitude towards technology acceptance and adoption. Individuals with high education level uses technology easily knowing that it is often positively correlated with his level of internet literacy (Burke, 2002). Therefore, the alternative hypothesis which states that there will be education level variations on the four dimensions was accepted.

Many previous researches have proven that highly educated persons are likely to adopt new technologies more than less educated ones (Lleras-Muney & Lichtenberg, 2002). Being educated and having information about the new technology will reduce adoption costs and uncertainty which will consequently increase the potential for adoption.

5.5.2.1. Educational level and NFC opportunities or advantages

As you can see in the above Table 18, the results were almost equal. Besides, individuals that have a university degree or vocational level are found to be a little more affected by NFC's opportunities or advantages to adapt NFC in City Mall. It is commonly known that when a person does not observe the advantages or opportunities of a new innovation he/she will likely reject it and search for an alternative that satisfies his/her needs. Therefore, everyone wants to use NFC if they perceive its opportunities and advantages.

5.5.2.2. Educational level and NFC security threats

Many studies (Schultz, 2005) have shown that organizations are still experiencing security breaches regardless of the number of technical support. And since we are dealing with sensitive data with NFC-payment, people will definitely have questions regarding its security threats.

The results of this study has shown that the decision of consumers with vocational level, university and above university degrees of whether to adopt NFC or not is affected by the perceived information security. However, Pre-University individuals were less caring for NFC's security.

5.5.2.3. Educational level and NFC usefulness or trend

This research found that vocational level consumers are affected by the usefulness and trend of NFC in order to adopt this new technology. This might be because vocational persons do not have the knowhow and therefore needs to use something easy and useful at the same time.

5.5.2.4. Educational level and NFC adaptability

The ability to learn and adapt to new technologies is associated with the level of education. Meaning that, educated persons are able to adapt and learn new technologies easily as compared to less educated ones. The results of this study were consistent with this theory where

individuals with university or above university degrees found themselves capable to adapt to NFC.

5.6. Hypothesis 3

As already stated in section 1.7 of Chapter 1 hypothesis 3 states:

"Since age appears to be a determinant in explaining attitudes to technology (Alharbi, 2012), it is hypothesized that age will explain variance in the new devised technology dimensions yielded from factor analysis."

Many previous studies ((Tacken, Marcellini, Mollenkopf, Ruoppila, & Szeman, 2005), (Richonnier, 1995) on technology acceptance found a strong relationship between age and the acceptance of a new technology. Meaning that, young individuals are more interested in using and adopting new technologies as compared to older individuals who have a negative attitude towards innovations and technology.

First of all, a recoding for the age was done in order to define a range for the age. This was done by dividing the cumulative percentage into 4 sections. Below you can see the modified age Table 19.

		N	Valid Percent	Cumulative Percent
Valid	15-23	49	23.4	23.4
	24-28	56	26.8	50.2
	29-35	51	24.4	74.6
	Above 36	53	25.4	100.0
	Total	209	100.0	
Missing	System	5		
Total		214		

Table 19: Age ranges

An Anova test was performed on age to determine its effect on the consumer's acceptance of NFC in City Mall. The results were inconsistent with previous researches where the test revealed no significance in relation to the four dimensions.

Below you can find a detailed analysis of these findings.

		n	$\bar{X}$	Std.
NFC opportunities or advantages	15-23	48	3.39	.56
	24-28	55	3.48	.65
	29-35	48	3.68	.60
	Above 36	51	3.42	.69
	Total	202	3.49	.63
NFC security threats	15-23	49	3.67	.70
	24-28	55	3.87	.76
	29-35	47	3.85	.67
	Above 36	53	3.79	.69
	Total	204	3.80	.71
NFC usefulness or trend	15-23	49	3.45	.64
	24-28	55	3.52	.54
	29-35	49	3.61	.67
	Above 36	51	3.48	.61
	Total	204	3.52	.62
NFC Adaptability	15-23	49	3.76	.66
	24-28	55	3.74	.55
	29-35	48	3.90	.61
	Above 36	53	3.61	.70
	Total	205	3.75	.64

Table 20: Anova test for age

Even though early adopters are found in all age groups, the older the individual, the less he/she is expected to adapt to a new technology.

5.6.1. Age and NFC opportunities or advantages

As stated by Richonnier in the European Martel forum, older people finds a new technology helpful if it supplies extra information needed in the domain of teleshopping, transport, etc. (Richonnier, 1995).

This research found that individuals between the age group of 29 and 35 are affected by NFC's opportunities and advantages more than other age groups. The least affected age group is between 15 and 23. It can be noticed in the Table 20 above that the results for all age groups were almost identical. However the mean of the age group of 29-35 was higher maybe because the sample was young.

5.6.2. Age and NFC security threats

As already stated above, consumers have security concerns towards NFC since they are storing their credit card information and paying through their mobiles. Therefore, they will definitely have concerns about the security and safety of their private information.

Whitman declared in 2001 that the best way to make sure that a security policy is feasible is to ensure that consumers understand it and accept necessary precautions (Whitman, A., & R., 2001).

Although the results of this survey were almost identical for all age groups; this study found that consumers between the age group of 24 and 35 are a little bit more affected by NFC security threats towards the adoption of this new technology in City Mall.

5.6.3. Age and NFC usefulness or trend

This research found that individuals between the age group of 29-35 are affected by NFC usefulness or trend in order to adopt it more than other age groups. This might be because young age groups are always looking for new trends and new technologies that might facilitate their lives.

5.6.4. Age and NFC adaptability

In 2008, Morrison and Barnett found shocking figures on old individual's use of technology. Seventy percent of individuals over 65 stated that they have never used internet. In addition, 81% of

individuals between the age group of 65 and 74 have a mobile however only 50% of individuals over 75 own one (Morrison & Barnett, 2008).

This study found that individuals between 29 and 35 are the most capable ones in adapting to new technology. However, the individuals that is older than 36 are the least ones capable of adapting it. This might be because they have difficulty learning to use new systems and that they would require more time to learn them than would younger people. Therefore, the alternative hypothesis which states that there will be age variations on the four dimensions was accepted.

5.7. Research Question #1

As already stated in section 1.6 of Chapter 1; the research question #1 that this research paper is aiming to answer is:

"What are the respondents' views towards the implementation of NFC in the grocery store in City Mall?"

The results of the survey showed that people had positive attitudes towards using NFC in City Mall. Respondents were found to be willing to use their Smartphone as their wallet and did not have a problem with storing their credit card details on their cell phones. In addition, they are willing to buy a new mobile if theirs doesn't have NFC. This is a very important issue, since few individuals has NFC enabled mobiles which will delay the use of NFC in City Mall.

Respondents were aware of the opportunities and advantages that NFC can offer. As they find it useful since it will accelerate the checkout process given that it increases the speed of payment. In addition, it can help them in better selecting the products they want to buy, save them from carrying several cards in their wallet and prevent them from losing them. Furthermore, they were positive about using NFC-payment when possible and were anxious about using this new technology as soon as it is possible.

The majority of the respondents said that they can easily adapt to a new technology and that it will be adapted by lots of people, however they agreed that they will not use NFC if it is hard to learn, not simple and not quick.

Nevertheless, a big percentage of people were neutral about the security of NFC, this might be because not everyone is familiar with this new technology and can hardly identify its security threats.

5.8. Research Question #2

As already stated in section 1.6 of Chapter 1; the research question #2 that this research paper is aiming to answer is:

"What type of dimensions did the eclectic model produce as yielded from respondents' views?"

To recapitulate; the variables that affect consumers acceptance of NFC in City Mall and extracted from the conceptual framework were the following:

1. Subjective norms
2. Ease of use
3. Opportunities and gains
4. Security effectiveness
5. Transition cost
6. Individual differences

These variables yielded new dimensions emerging from the Lebanese context. The new extracted dimensions that have effect on consumers' adoption of NFC in City Mall are:

1. NFC opportunities or advantages
2. NFC security threats
3. NFC usefulness or trend
4. NFC adaptability

The see the details of this research question, refer back to Table 15 of section 5.4.

5.9. Research Question #3

As already stated in section 1.6 of Chapter 1; the research question #3 that this research paper is aiming to answer is:

"What variations are found on the new dimensions according to age, gender and educational level variables?"

5.9.1. Gender

Based on the survey and the above analysis, no significant variation was found between males and females. Their choice whether to accept to use NFC in the grocery store in City Mall or not are both affected by NFC opportunities or advantages, security threats and usefulness or trend. In addition, they both find themselves capable to adapt to NFC.

Men and women are nowadays almost equally educated which consequently integrates women more into the use and acceptance of technology. As already mentioned before, both men and women are keen of NFC benefits and therefore are almost equally interested in using it in the grocery store in City Mall.

5.9.2. Educational level

Small variation was found concerning the effect of educational level on the acceptance of NFC in the grocery store in City Mall. The results showed that individuals with a university degree or vocational level are more affected by the opportunities or advantages that NFC can offer in relation to its adoption. Furthermore, individuals with vocational level showed interest to its usefulness or trend. Besides, all consumers had concerns for NFC's security threats except for ones with Pre-University degree that were a little bit less caring.

5.9.3. Age

Almost all age groups were found to accept the use of NFC in the grocery store in City Mall. However, a small variation was found towards the acceptance of this technology by older people; where older people needed to see the opportunities and advantages that NFC can offer and were perceived to have little concerns towards its adaptability. However, younger people between 15 and 23 had concerns towards NFC security threats more than other age groups and were less caring about its opportunities or advantages.

5.10. Conclusion

The aim of this chapter was to highlight the findings of significance to specify the factors affecting City Mall's customers' decision towards accepting NFC in the grocery store.

Below a summary of the significance of each independent variable on the dependent variables is given Table 21.

	NFC opportunities or advantages	**NFC security threats**	**NFC usefulness or trend**	**NFC adaptability**
Gender				
Female	+	-	-	+
Male	-	+	+	-
No or small variation was found concerning the acceptance of NFC in City Mall between men and women. As stated above, females are nowadays more educated and are interested in new technology and trends similar to males. Therefore, this study found no difference between male and female concerning the acceptance of NFC in the grocery store in City Mall.				
Education Level				
Pre-University	-	-	-	-
University	+	+		
Above				+

University				
Vocational			+	+
Concerning education level, only a small variation was found. Where individuals with Pre-University level of education were less affected by all the dimensions in relation to the adoption of NFC in the grocery store in City Mall. However, individuals with University degree were found to have more concerns towards NFC security threats and were more affected by the opportunities and advantages that NFC can offer in relation to the adoption decision. Furthermore, vocational and above university educational levels were found to be more capable to adapt to NFC than others. Nevertheless, individuals with vocational level were more interested in NFC usefulness or trend in order to adopt NFC.				
Age				
15-23	-	-	-	
24-28		+		
29-35	+	+	+	+
Above 36	-		-	-
Individuals with the age less than 23 and above 36 were found to have less significance towards NFC opportunities or advantages. In contrary, the age group of 29-35 was found to be affected by NFC opportunities or advantages in relation to the adoption of NFC in the grocery store at City Mall. Furthermore, the age group of 15-23 was found to be less caring about the security threats of NFC. However, individuals between 24 and 35 had more concerns towards NFC security threats in relation to the adoption decision. Moreover, individuals between 29 and 35 are influenced by the usefulness or trend of NFC and find themselves capable to adapt to NFC more than the age groups of 15-23 and above 36.				

Table 21: Summary of all hypothesis

Chapter 6. CONCLUSIONS AND RECOMMENDATIONS

6.1. Introduction

This chapter discusses the findings and limitations of this research. This research explored how education level, age and gender have the potential to impact consumers' acceptance of NFC in the grocery store in City Mall. Future research suggestions are suggested to advance knowledge in the field.

The goal of this research was to determine the effect of age, education level and gender on the acceptance of a new technology. In addition, determine and assess the perceived benefits and challenges of implementing this new technology in the grocery store in City Mall and the consumers' acceptance of this technology.

This research yielded new dimensions developed from the eclectic NFC model from which the dependent variables were extracted: NFC opportunities or advantages, NFC security threats, NFC usefulness or trend and NFC adaptability. Then, the effect of age, gender and educational level was studied to determine the significance of each of the independent variables on the dependent variables.

6.2. Main findings

This study found that cash is the most preferred payment method. Where 68.7% chose cash, 30.4% chose credit card and only 0.9% preferred to use check. This finding is contrary to the results of Roeen Roashan who investigated if consumers in Denmark will adopt Near Field Communication based mobile payment and found that 84% of the population prefers credit card payment method, 8% prefer internet banking and the remaining 8% prefer cash (Roashan, 2011).

Venkatesh found in 2000 that women's decision whether to adopt a new technology or not is highly affected by the difficulty of using it (Venkatesh, 2000). The findings of this research argues with Venkatesh's findings where men and women were found to be both affected by the usefulness of NFC in order to adopt it in the grocery store in City Mall.

In 2011, Tan and Ooi synthesized that Perceived usefulness has positive relationship towards mobile credit card adoption in Malaysia (Tan W., 2011). This study found that both males and females whether educated or not will use NFC if they perceive the opportunities and advantages that it can offer. A very small variation was found for the age group of 29-35 where they were found to be more affected by NFC's advantages more than other age groups.

In 2011, Peter and Rasmus found that perceived security is essential to old generations rather than younger ones (Stalfors & Nykvist, 2011). However, this study found that consumers, whether males or females, between the age group of 24 and 35 were a little bit more affected by NFC security threats towards the adoption of NFC.

6.3. Limitation of the research

The survey of this research was performed using an opportunistic sampling technique rather than a clustered one. Respondents were selected because they happened to be at City Mall at a particular time. This kind of sampling is not generalizable to a large population.

A basic assumption was set to conduct this study where respondents are assumed to be honest with their answers. This assumption was supported by providing each respondent a full disclosure of the nature of the study, risks, benefits and alternatives, with an extended opportunity to ask questions. In addition, an informed consent document was handed to the respondents to ensure that they are voluntarily participating in the research with full knowledge of relevant risks and benefits.

6.4. Managerial implications

The findings of this study indicate that for City Mall's managers to fully satisfy and indentify customers' needs and behaviors; they must address the factors studied in this research. Their decision about whether to implement this new technology in the grocery store in City Mall should depend on the customers' decision towards adopting this technology. Customers' decision appeared to depend on the

opportunities or advantages that NFC can offer, employs effective security measures, is useful and can be easily adapted.

6.5. Recommendations

This research could be expanded to include various supermarkets distributed across Lebanon. This might demonstrate if the results of this study were consistent across multiple districts and thereby generalizable.

Furthermore, to be able to complete a more complex analysis, a larger sample size is needed for more thorough results. The larger the sample size, the more the interrelation between the independent and the dependent variables is.

Data collected were not gathered to determine if any of the subjects were married. Studies could be performed to assess the impact of being married on the need for shopping and the need of using NFC in the supermarket.

Other potential options could also be studied such as implementing NFC in parking lots, using NFC for warehouse control and venue reviews and finally using NFC as a tool for marketing.

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APPENDIX A

CONSENT FORM FOR RESPONDANTS

Consent Form for Respondents

My name is Rita Merheb and I am a graduate student of Notre Dame University Louaize (NDU) in the Masters of Business Administration and International Business. I am conducting a research on user acceptance of Near Field Communication (NFC) in City Mall. The purpose of this research is to identify the challenges, benefits, success factors and barriers to implementing NFC in City Mall.

Your answers are very important to this research. You do not have to answer any question that you do not wish to. In addition, no identifying information is required in this survey; I do not want you to put your name. Your identity will be kept confidential. There are no anticipated risks or direct benefits to you as a participant. No compensation will be granted for participating. After our research is completed, I will be happy to discuss the results with you.

If you choose to participate, you are free to withdraw your consent at any time and discontinue participation at any time without prejudice or repercussion. If, at any time, there are questions about the procedure, contact me at rita-merheb@hotmail.com. Questions or concerns about research participants' rights may be directed to me. If you would like to participate please read the following statement and sign and date the appropriate line below.

I have read the procedure described above. I agree to participate in the procedure and I have received a copy of this description.

_____ _____

Participant's Signature Date

_____ _____

Researcher's Signature Date

APPENDIX B

Ref:_____

QUESTIONNAIRE

This questionnaire will take approximately 15 minutes to complete.

It is designed to provide understanding about your ideas and current perspectives towards accepting Near Field Communication (NFC) in City Mall. NFC is a wireless connection technology integrated in mobile phones that enables you to pay using your Smartphone, get product information, store tickets and coupons by just touching your phone with an NFC equipped device.

The questions that follow will assist in assessing your perceptions about this new technology.

All information collected will be kept strictly confidential and your identity will not be revealed to anyone other than the researcher and research supervisors at Notre Dame University Louaize (NDU).

Section A: Please answer the following questions by placing an 'X' only once in the appropriate response box.

1. Do you usually shop in the same place?
   - ☐ Yes
   - ☐ No
   - ☐ From time to time

2. How often do you shop in supermarkets in a month?
   - ☐ Less than once
   - ☐ 1 or 2 times
   - ☐ 2 or 3 times
   - ☐ 3 or 4 times
   - ☐ More than 4 times

3. Time spent while shopping
   - ☐ More than 3 hours
   - ☐ 2 – 3 hours
   - ☐ 1 – 2 hours
   - ☐ 1/2 – 1 hour
   - ☐ Less than half an hour

4. You are having problems finding store representatives in the supermarket
   - ☐ Yes
   - ☐ No
   - ☐ Sometimes

5. Store representatives doesn't have enough product knowledge to assist you
   - ☐ Yes
   - ☐ No
   - ☐ Sometime

6. What is your preferred payment method?
   - ☐ Credit card
   - ☐ Cash
   - ☐ Check

7. How much money do you spend each time you shop?
   - ☐ More than 300 $
   - ☐ 200 $ – 300 $
   - ☐ 100 $ - 199 $
   - ☐ 50 $ - 99 $
   - ☐ Less than 50 $

8. What kind of mobile phones do you carry and specify the model (Samsung S2, S3 ...)
   - ☐ Iphone ----------
   - ☐ Samsung ----------
   - ☐ HTC ----------
   - ☐ Nokia ----------
   - ☐ Blackberry ----------
   - ☐ Sony ----------
   - ☐ Other ----------

9. How often do you change your cell phone?
   - ☐ Once every 3 years
   - ☐ Once every 2 years
   - ☐ Once per year
   - ☐ Twice per year
   - ☐ Three times per year
   - ☐ More than three times per year

10. Why do you change your cell phone?
   - ☐ Broken
   - ☐ Old
   - ☐ Seeking for new features
   - ☐ Stylish
   - ☐ Peer pressure

11. What's your budget when buying a new cell phone?
   - ☐ > 700 $
   - ☐ 600 $ - 700 $
   - ☐ 500 $ – 599 $
   - ☐ 400 $ - 499 $
   - ☐ 300 $ - 399 $
   - ☐ 200 $ - 299 $
   - ☐ 100 $ - 199 $
   - ☐ < 100 $

12. How many times do you recharge your battery?
   - ☐ More than 2 times per day
   - ☐ 2 times per day
   - ☐ 1 time per day
   - ☐ 1 time per 2 days
   - ☐ 1 time per 3 days

Section B: Please rank order the following possible answers in order of your preference

1. Please rank order the following supermarkets in order of your preference of shopping (1 being the highest and 7 being the lowest)
   - City Mall _____
   - Carrefour _____
   - Charcutier Aoun _____
   - Spinneys _____
   - Bou Khalil _____
   - Supermarket Fahed _____
   - Metro _____

2. Shopping in a specific supermarket depends on (1 being the highest and 8 being the lowest)
   - Location _____
   - Lower items' price _____
   - Hygiene _____
   - Variety of brands _____
   - Size _____
   - Parking space _____
   - Number of cashier _____
   - Number of store representatives _____

3. What are the criteria for choosing a new cell phone? (1 being the highest and 5 being the lowest)
   - Appearance _____
   - Features _____
   - User friendly _____
   - Brand name _____
   - Price _____

4. How do you use your mobile phone? (1 being the highest and 8 being the lowest)
   - Making phone calls _____
   - SMS _____
   - Alarm clock _____
   - Calendar _____
   - Social networking _____
   - Email _____
   - Video streaming _____
   - Reading news _____

Section C: Please answer the following questions by placing an 'X' in the appropriate response box.

1) Willingness to adapt NFC technology	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
8. I'm in favor of using my Smartphone as my wallet					
9. I'm okay with storing my credit cards details on my cell phone					
10. If my phone doesn't have NFC, I am willing to buy a new one					

2) The future of NFC	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
11. NFC will accelerate the checkout process in the supermarket					
12. I am interested to use NFC in other supermarkets					
13. Most people will be likely using NFC in the future					

3) My peers perception towards using NFC influences my behavior	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
14. I will use NFC if my friends or relatives uses it					
15. I will not use NFC if my friends or relatives have security concerns regarding NFC					
16. I will use NFC if my friends or relatives finds it useful					

4) Benefits and advantage of NFC	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
17. Storing my credit cards, tickets and coupons on my cell phone saves me from carrying several cards in my wallet					
18. Storing my credit cards, tickets and coupons on my cell phone saves me from losing some cards					
19. Using NFC will increase the speed of payment					
20. NFC will help me to better select the products I want to buy					

5) Easiness of NFC	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
21. I can easily adapt to a new technology					
22. I will not use NFC if it is hard to learn					
23. I will use NFC if it is simple					
24. I will use NFC if it is quick					

6) Attitude about using NFC-payment, when possible	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
25. I want to use it as soon as the technology is possible					
26. I will never use this technology					
27. I will use it if it gives me discount					
28. I will use it when I do not have neither cash or debit card					
29. I will use it when I'm in a hurry					

7) Major Security Threats	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
30. Eavesdropping					
31. Data Modification					
32. Data Corruption					
33. Interception of a third party					

Section D: Background Information

1. Age : _____

2. Gender
   - ☐ Male
   - ☐ Female

3. Highest education level attained
   - ☐ Pre-secondary
   - ☐ Secondary
   - ☐ University (BA)
   - ☐ University (Above BA)
   - ☐ Vocational
   - ☐ No formal education

4. Field of work
   - ☐ Student
   - ☐ Medicine
   - ☐ Education
   - ☐ Business
   - ☐ Information technology
   - ☐ Engineering
   - ☐ Arts
   - ☐ Others, please specify _____

5. Residence Area
   - ☐ Beirut
   - ☐ Mount Lebanon
   - ☐ North Lebanon
   - ☐ South Lebanon
   - ☐ Beqaa
   - ☐ Nabatieh

6. District (قضاء) _____

Thank you for taking the time to complete this questionnaire. Your input is a valuable and important contribution to the results of this research project.

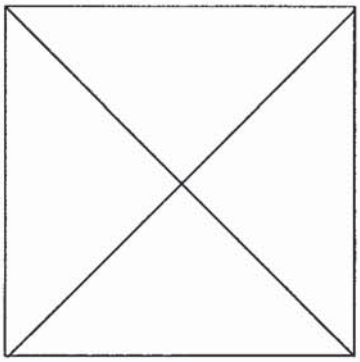
APPENDIX C

استمارة الموافقة للمستجيبين

اسمي ريتا مرعب، طالبة دراسات عليا في جامعة سيدة اللويزة (NDU) في شهادة الماجستير في إدارة الأعمال وإدارة الأعمال الدولية. إنّني أجري بحثاً عن قبول المستخدم من الاتّصالات الميدانيّة الأدنى (NFC) في City Mall. والغرَض من هذا البحث هو تحديد التحدّيات، والفوائد، عوامل النجاح والحواجز التي تؤثّر على تنفيذ NFC في City Mall.

إجاباتك مهمّة جداً لهذا البحث. لستَ مجبراً للإجابة على أيّ سؤالٍ إن كنت لا ترغبُ بذلكَ. وبالإضافةِ إلى ذلكَ، لا يلزمُ تحديد أيّ معلوماتٍ خاصّةٍ في هذه الدراسة، و لا أريدُ منكَ أن تضعَ اسمكَ. لن يتمَّ الكشف عن هويّتك. لا يوجد أي مخاطر متوقعة أو فوائد في المشاركة. لن يتمَّ منح أي تعويض للمشاركة. بعد اكتمال البحث لدينا، سوف أكون سعيدة لمناقشة النتائج معك.

إذا اخترت المشاركة، أنت حر في سحب الموافقة في أي وقت والتوقف عن المشاركة في أي وقت دون تحيُّز أو تداعيات. إذا كانت لديك أسئلة يمكنك أن ترسل لي رسالة على Rita-merheb@hotmail.com. أيّة أسئلة أو إستفسار حول حقوق المشاركين في البحث موجّهة إليّ. إذا كنت ترغب في المشاركة يرجى قراءة البيان التالي والتّوقيع و تحديد التاريخ في الخطّ المناسب أدناه.



لقد قرأت الإجراء المذكورة أعلاه. أوافق على المشاركة في الإجراء وأنا قد استلمت نسخة من هذا الوصف.

_____	_____
ألتاريخ	توقيع المشارك
_____	_____
ألتاريخ	توقيع الباحث

APPENDIX D

رقم الإستمارة: _____

هذا الإستبيان يستغرق حوالي ١٥ دقيقة لإكمال.

إنّه مصمّم للتعرُّف على الاتّجاهات نحو قبول الاتّصالات الميدانية الأدنى (NFC) في NFC .City Mall هي تقنيّة اتّصال لاسلكي متكاملة في الهواتف النقالة والتي تمكّنك من الدفع باستخدام الهاتف الخاص بك، والحصول على معلومات عن المنتجات، وتذاكر السفر وقسائم تخزين فقط عن طريق لمس هاتفك مع جهاز مجهَّزة NFC

الأسئلة التي تلي تساعد في تقييم التصوُّرات الخاصّة بك عن هذه التكنولوجيا الجديدة.

جميع المعلومات التي تمّ جمعها ستبقى في سريّة تامّة ولن يتمّ كشف هويتُك إلى أي شخص آخر من الباحث والبحوث المشرّفين في جامعة سيدة اللويزة.

ألقسم أ: ألرَّجاء الإجابة على الأسئلة التّالية عن طريق وضع 'X' مرّة واحدة فقط في مربّع الرد المناسب

أ . هل تتسوّق عادةً في نفس المكان؟

- ☐ نعم
- ☐ لا
- ☐ من آن لآخر

ب. كم مرّة تتسوّق في السوبر ماركت في شهر؟

- ☐ أقل من مرّة واحدة
- ☐ ١ أو ٢ مرّات
- ☐ ٣ أو ٤ مرّات
- ☐ أكثر من ٤ مرّات

ت. الوقت الّذي تمضيهِ أثناء التسوُّق

- ☐ أكثر من ٣ ساعات
- ☐ ٢ – ٣ ساعات
- ☐ ١ - ساعتين
- ☐ نصف ساعة إلى ساعة
- ☐ أقل من نصف ساعة

ث . من الصعب إيجاد موظّف لمساعدتك في السوبر ماركت

☐ نعم

☐ لا

☐ احياناً

ج . يفتقر الموظّفين للمعلوماتِ الكافية لمساعدتك في عمليّة التسوُّق

☐ نعم

☐ لا

☐ احياناً

ح . ما هي طريقة الدفع المفضّلة لديك

☐ بطاقة إئتمان

☐ نقداً

☐ شيك

خ . كم تبلغ القيمة الشرائيّة لكلّ عمليّة تسوُّق تقوم بها

☐ أكثر من ٣٠٠ $

☐ ٢٠٠ $ - ٣٠٠ $

☐ ١٩٩ $ - ١٠٠ $

☐ ٩٩ $ - ٥٠ $

☐ أقل من ٥٠ $

د . ما نوع الهاتف الخليوي الّذي تستخدمه وحدّد النوع (Samsung S2, S3)

☐ Iphone ----------

☐ Samsung ----------

☐ HTC ----------

☐ Nokia ----------

☐ Blackberry ----------

☐ Sony ----------

☐ اخر ----------

ذ . متى تجدّد هاتفك الخلوي؟

- ☐ مرّة واحدة كلّ ٣ سنوات
- ☐ مرّة واحدة كلّ سنتين
- ☐ مرّة واحدة كلّ سنة
- ☐ مرتين سنوياً
- ☐ ثلاث مرّات في السّنة
- ☐ أكثر من ثلاث مرأت في السّنة

ر . لماذا تجدّد هاتفك الخلوي؟

- ☐ معطّل
- ☐ قديم
- ☐ تسعى لميّزات جديدة
- ☐ على الموضة
- ☐ ضغط المجتمع

ز . ما هي ميزانيّتك لشراء هاتف خليوي جديد

- ☐ أكثر من ٧٠٠ $
- ☐ ٦٠٠ $ - ٧٠٠ $
- ☐ ٥٩٩ $ - ٥٠٠ $
- ☐ ٤٩٩ $ - ٤٠٠ $
- ☐ ٣٩٩ $ - ٣٠٠ $
- ☐ ٢٩٩ $ - ٢٠٠ $
- ☐ ١٩٩ $ - ١٠٠ $
- ☐ أقل من ١٠٠ $

س. كم مرّة تشحن بطّاريّة هاتفك الخليوي

- ☐ أكثر من مرّتين في اليوم الواحد
- ☐ مرّتين في اليوم الواحد
- ☐ مرّة واحدة في اليوم
- ☐ مرّة واحدة في يومين
- ☐ مرّة واحدة في ثلاثة أيّام

ألقسم ب: ألرجاء ترقيم الإجابات المحتملة التالية حسب الأفضليَّة

أ . ألرجاء ترقيم السوبر ماركت حسب أفضليَّة التسوُّق (١ هي أعلى و ٧ أدنى)

- City Mall ----------
- Carrefour ----------
- Charcutier Aoun ----------
- Spinneys ----------
- Bou Khalil ----------
- Supermarket Fahed ----------
- Metro ----------

ب. قرار التسوُّق في سوبر ماركت محدَّدة تعتمد على (١ هي أعلى و ٨ أدنى)

- الموقع ----------
- أسعار منخفضة ----------
- النظافة ----------
- تنوُّع العلامات التجارية ----------
- حجم السوبر ماركت ----------
- أماكن لوقوف السيارات ----------
- عدد صناديق الدفع ----------
- عدد الموظَّفين ----------

ت. ما هي المعايير لاختيارك هاتف خليوي جديد (١ هي أعلى و ٥ أدنى)

- المظهر ----------
- مواصفات ----------
- سهل الإستخدام ----------
- العلامة التجاريَّة ----------
- السعر ----------

ث. كيف تستخدم هاتفك الخليوي (١ هي أعلى و ٨ أدنى)

- إجراء مكالمات هاتفيَّة ----------
- رسالة نصيَّة ----------
- منبِّه ----------
- حفظ المواعيد ----------
- شبكات التواصل الإجتماعيَّة ----------
- البريد الإلكتروني ----------
- فيديو ----------
- متابعة الأخبار ----------

ألقسم ت: ألرّجاء الإجابة على الأسئلة التّالية عن طريق وضع 'X' في مربّع الرد المناسب

١) استعدادك للتكيُّف مع تقنيّة NFC	لا أوافق بشدّة	لا أوافق	محايد	أوافق	أوافق بشدّة
أ. أنا مع إستخدام هاتفي الخليوي كأداةٍ للدفع					
ب. أنا مع تخزين تفاصيل بطاقات الائتمان الخاصّة بي على هاتفي الخلوي					
ت. إذا كان هاتفي لا يحتوي على NFC، أنا على استعدادٍ لشراء واحدٍ جديد					

٢) مستقبل NFC	لا أوافق بشدّة	لا أوافق	محايد	أوافق	أوافق بشدّة
أ. NFC سوف تساعد في تسريع عمليّة الدفع في السوبر ماركت					
ب. أنا مهتم لإستخدام NFC في محلات السوبر ماركت الأخرى					
ت. معظم الناس سوف يستخدمون NFC في المستقبل					

٣) وجهة نظر زملائي تجاه إستخدام NFC تؤثّر على سلوكي	لا أوافق بشدّة	لا أوافق	محايد	أوافق	أوافق بشدّة
أ. سوف أستخدم NFC إن أصدقائي أو أقاربي إستخدموه					
ب. لن استخدم NFC إن أصدقائي أو أقاربي لديهم مخاوف أمنية تجاهه					
ت. سوف أستخدم NFC إن أصدقائي أو أقاربي يرون أنّه مفيد					

٤) فوائد NFC	لا أوافق بشدّة	لا أوافق	محايد	أوافق	أوافق بشدّة
أ. تخزين بطاقات الائتمان الخاصّة بي، وتذاكر السفر وكوبونات على هاتفي الخلوي يوفّر عليّ من حمل في محفظتي عدّة بطاقات					
ب. تخزين بطاقات الائتمان الخاصّة بي، وتذاكر السفر وكوبونات على هاتفي الخلوي يوفّر عليّ فقدان بعض بطاقات					
ت. إستخدام NFC سوف يزيد سرعة الدفع					
ث. NFC سوف تساعدني لتحديد أفضل المنتجات الّتي أريد شرائها					

٥) سهولة إستخدام NFC	لا أوافق بشدّة	لا أوافق	محايد	أوافق	أوافق بشدّة
أ. يمكنني أن أتكيّف بسهولة مع تكنولوجيا جديدة					
ب. لن استخدم NFC إذا كان تعلّمها صعب					
ت. سوف أستخدم NFC إذا كانت غير معقّدة					
ث. سوف أستخدم NFC إذا كانت سريعة					

٦) موقفك حيال إستخدام NFC للدفع، عندما يكون ذلك ممكنا	لا أوافق بشدّة	لا أوافق	محايد	أوافق	أوافق بشدّة
أ. أريد أن استخدمها حالما تتوفّر التكنولوجيا					
ب. لن استخدم هذه التكنولوجيا					
ت. سوف أستخدمها إذا تؤمّن أسعار منخفضة					
ث. سوف أستخدمها عندما لا أملك لا نقداً و لا بطاقة إئتمان					
ج. سوف أستخدمها عندما أكون في عجلة					

٧) مخاطر إستعمال NFC	لا أوافق بشدّة	لا أوافق	محايد	أوافق	أوافق بشدّة
أ. التنصت					
ب. تعديل المعلومات					
ت. تلف المعلومات					
ث. تدخل طرف ثالث					

ألقسم ث: معلومات شخصيَّة

أ. العمر: _____ سنة

ب. الجنس
- ☐ ذكر
- ☐ انثى

ت. أعلى مستوى التحصيل العلمي
- ☐ ما قبل الثانوي
- ☐ الثانوية
- ☐ جامعة (دراسات عليا)
- ☐ جامعة (ماجستار)
- ☐ التدريب المهني
- ☐ لا تعليم رسمي

ث. مجال العمل
- ☐ طالب
- ☐ طبّ
- ☐ تعليم
- ☐ تجارة
- ☐ تكنولوجيا المعلوماتيّة
- ☐ هندسة
- ☐ فنون
- ☐ أخرى، يرجى التحديد

ج. منطقة سكن
- ☐ بيروت
- ☐ جبل لبنان
- ☐ شمال لبنان
- ☐ جنوب لبنان
- ☐ البقاع
- ☐ النبطية

ح. قضاء: _____

أشكرك على وقتك للمشاركة في هذا الاستطلاع. الإدخال الخاص بك هو مساهمة قيِّمة ومهمَّة لنتائج هذا البحث.

APPENDIX E

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15	1	.5	.5	.5
	17	2	.9	1.0	1.4
	18	1	.5	.5	1.9
	19	2	.9	1.0	2.9
	20	7	3.3	3.3	6.2
	21	11	5.1	5.2	11.4
	22	11	5.1	5.2	16.7
	23	15	7.0	7.1	23.8
	24	14	6.5	6.7	30.5
	25	10	4.7	4.8	35.2
	26	11	5.1	5.2	40.5
	27	11	5.1	5.2	45.7
	28	10	4.7	4.8	50.5
	29	9	4.2	4.3	54.8
	30	14	6.5	6.7	61.4
	31	9	4.2	4.3	65.7
	32	10	4.7	4.8	70.5
	33	4	1.9	1.9	72.4
	34	2	.9	1.0	73.3
	35	3	1.4	1.4	74.8
	36	4	1.9	1.9	76.7
	37	4	1.9	1.9	78.6
	38	1	.5	.5	79.0
	39	4	1.9	1.9	81.0
	40	2	.9	1.0	81.9
	41	3	1.4	1.4	83.3
	42	2	.9	1.0	84.3
	43	1	.5	.5	84.8
	44	2	.9	1.0	85.7
	45	3	1.4	1.4	87.1
	46	1	.5	.5	87.6

	47	5	2.3	2.4	90.0
	49	2	.9	1.0	91.0
	50	3	1.4	1.4	92.4
	52	1	.5	.5	92.9
	53	4	1.9	1.9	94.8
	54	3	1.4	1.4	96.2
	55	2	.9	1.0	97.1
	56	2	.9	1.0	98.1
	60	2	.9	1.0	99.0
	67	1	.5	.5	99.5
	68	1	.5	.5	100.0
	Total	210	98.1	100.0	
Missing	System	4	1.9		
Total		214	100.0		

Table 22: Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	104	48.6	49.1	49.1
	Female	108	50.5	50.9	100.0
	Total	212	99.1	100.0	
Missing	System	2	.9		
Total		214	100.0		

Table 23: Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Pre-secondary	11	5.1	5.2	5.2
	Secondary	20	9.3	9.4	14.6
	University (BA)	114	53.3	53.8	68.4
	University (above BA)	61	28.5	28.8	97.2
	Vocational	4	1.9	1.9	99.1
	No formal education	2	.9	.9	100.0
	Total	212	99.1	100.0	
Missing	System	2	.9		

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Pre-secondary	11	5.1	5.2	5.2
	Secondary	20	9.3	9.4	14.6
	University (BA)	114	53.3	53.8	68.4
	University (above BA)	61	28.5	28.8	97.2
	Vocational	4	1.9	1.9	99.1
	No formal education	2	.9	.9	100.0
	Total	212	99.1	100.0	
Missing	System	2	.9		
Total		214	100.0		

Table 24: Education Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Student	11	5.1	5.4	5.4
	Medicine	10	4.7	4.9	10.3
	Education	8	3.7	3.9	14.3
	Business	65	30.4	32.0	46.3
	Information Technology	52	24.3	25.6	71.9
	Engineering	19	8.9	9.4	81.3
	Arts	14	6.5	6.9	88.2
	No work	14	6.5	6.9	95.1
	Accounting	4	1.9	2.0	97.0
	Maintenance	2	.9	1.0	98.0
	Traduction	2	.9	1.0	99.0
	secretary	2	.9	1.0	100.0
	Total	203	94.9	100.0	
Missing	System	11	5.1		
Total		214	100.0		

Table 25: Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Beirut	34	15.9	17.0	17.0

	Baabda	51	23.8	25.5	42.5
	Aley	3	1.4	1.5	44.0
	Matn	66	30.8	33.0	77.0
	Keserwan	31	14.5	15.5	92.5
	Chouf	1	.5	.5	93.0
	Jbeil	4	1.9	2.0	95.0
	Akkar	3	1.4	1.5	96.5
	Bsharri	2	.9	1.0	97.5
	Batroun	1	.5	.5	98.0
	Zahle	1	.5	.5	98.5
	Jezzine	1	.5	.5	99.0
	Nabatiyeh	1	.5	.5	99.5
	Marjeyoun	1	.5	.5	100.0
	Total	200	93.5	100.0	
Missing	System	14	6.5		
Total		214	100.0		

Table 26: District

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	87	40.7	40.8	40.8
	No	56	26.2	26.3	67.1
	From time to time	70	32.7	32.9	100.0
	Total	213	99.5	100.0	
Missing	System	1	.5		
Total		214	100.0		

Table 27: Do you usually shop in the same place

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than once	19	8.9	8.9	8.9
	1 or 2 times	79	36.9	37.1	46.0
	2 or 3 times	55	25.7	25.8	71.8
	3 or 4 times	43	20.1	20.2	92.0

	more than 4 times	17	7.9	8.0	100.0
	Total	213	99.5	100.0	
Missing	System	1	.5		
Total		214	100.0		

Table 28: How often do you shop in supermarkets in a month?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than 3 hours	6	2.8	2.8	2.8
	2 - 3 hours	34	15.9	16.0	18.8
	1 - 2 hours	63	29.4	29.6	48.4
	1/2 - 1 hour	83	38.8	39.0	87.3
	Less than half an hour	27	12.6	12.7	100.0
	Total	213	99.5	100.0	
Missing	System	1	.5		
Total		214	100.0		

Table 29: Time spent while shopping

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	51	23.8	23.9	23.9
	No	66	30.8	31.0	54.9
	Sometimes	96	44.9	45.1	100.0
	Total	213	99.5	100.0	
Missing	System	1	.5		
Total		214	100.0		

Table 30: You are having problems finding store representatives in the supermarket

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	53	24.8	24.8	24.8
	No	44	20.6	20.6	45.3
	Sometime	117	54.7	54.7	100.0
	Total	214	100.0	100.0	

Table 31: Store representatives doesn't have enough product knowledge to assist you

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Credit Card	65	30.4	30.4	30.4
	Cash	147	68.7	68.7	99.1
	Check	2	.9	.9	100.0
	Total	214	100.0	100.0	

Table 32: What is your preferred payment method?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than 300$	13	6.1	6.1	6.1
	200$ - 300$	30	14.0	14.0	20.1
	100$ - 199$	78	36.4	36.4	56.5
	50$ - 99$	60	28.0	28.0	84.6
	Less than 50$	33	15.4	15.4	100.0
	Total	214	100.0	100.0	

Table 33: How much money do you spend each time you shop?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	57	26.6	26.8	26.8
	No	156	72.9	73.2	100.0
	Total	213	99.5	100.0	
Missing	System	1	.5		
Total		214	100.0		

Table 34: The participants' mobile phone includes NFC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Once every 3 years	46	21.5	21.5	21.5
	Once every 2 years	101	47.2	47.2	68.7

	Once per year	53	24.8	24.8	93.5
	Twice per year	6	2.8	2.8	96.3
	Three times per year	2	.9	.9	97.2
	More than three times per year	6	2.8	2.8	100.0
	Total	214	100.0	100.0	

Table 35: How often do you change your cell phone?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Broken	54	25.2	25.5	25.5
	Old	52	24.3	24.5	50.0
	Seeking for new features	86	40.2	40.6	90.6
	Stylish	17	7.9	8.0	98.6
	Peer pressure	3	1.4	1.4	100.0
	Total	212	99.1	100.0	
Missing	System	2	.9		
Total		214	100.0		

Table 36: Why do you change your cell phone?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	>700$	20	9.3	9.4	9.4
	600$ - 700$	34	15.9	16.0	25.4
	500$ - 599$	39	18.2	18.3	43.7
	400$ - 499$	28	13.1	13.1	56.8
	300$ - 399$	40	18.7	18.8	75.6
	200$ - 299$	37	17.3	17.4	93.0
	100$ - 199$	9	4.2	4.2	97.2
	< 100$	6	2.8	2.8	100.0
	Total	213	99.5	100.0	
Missing	System	1	.5		
Total		214	100.0		

Table 37: What's your budget when buying a new cell phone?

	n	$\bar{X}$	Std.
City Mall	209	3.09	1.927
Carrefour	208	4.64	1.878
Charcutier Aoun	210	2.60	1.625
Spinneys	208	3.21	1.680
Bou Khalil	206	4.91	1.686
Supermarket Fahed	208	4.18	1.853
Metro	207	5.22	1.795
Valid N (listwise)	206		

Figure 40: Supermarkets Ranking

	n	$\bar{X}$	Std.
Location	210	2.28	1.854
Lower item's price	209	3.52	2.019
Hygiene	210	3.28	1.989
Variety of brands	211	4.00	1.863
Size	209	5.02	1.721
Parking Space	212	4.53	1.861
Number of cashier	208	5.98	1.515
Number of store representatives	208	7.03	1.449
Valid N (listwise)	207		

Figure 41: Shopping in specific supermarket depends on

	n	$\bar{X}$	Std.
Appearance	210	3.17	1.361
Features	211	2.03	1.228
User friendly	209	2.89	1.283
Brand name	209	3.47	1.279
Price	209	3.40	1.445
Valid N (listwise)	209		

Figure 42: Criteria for choosing a new cell phone?

	n	$\bar{X}$	Std.
Making phone calls	212	1.92	1.511
SMS	211	3.46	1.733
Alarm Clock	209	4.41	1.725

Calendar	208	5.37	1.674
Social networking	210	3.05	1.974
Email	208	4.93	1.968
Video streaming	208	6.46	1.490
Reading news	208	6.30	1.903
Valid N (listwise)	208		

Figure 43: How do you use your mobile phone?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	11	5.1	5.3	5.3
	Disagree	32	15.0	15.3	20.6
	Neutral	56	26.2	26.8	47.4
	Agree	85	39.7	40.7	88.0
	Strongly Agree	25	11.7	12.0	100.0
	Total	209	97.7	100.0	
Missing	System	5	2.3		
Total		214	100.0		

Figure 44: I'm in favor of using my Smartphone as my wallet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	21	9.8	9.9	9.9
	Disagree	55	25.7	25.9	35.8
	Neutral	51	23.8	24.1	59.9
	Agree	70	32.7	33.0	92.9
	Strongly Agree	15	7.0	7.1	100.0
	Total	212	99.1	100.0	
Missing	System	2	.9		
Total		214	100.0		

Figure 45: I'm ok with storing my credit cards details on my cell phone

		Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Strongly Disagree	14	6.5	6.6	6.6
	Disagree	37	17.3	17.4	23.9
	Neutral	85	39.7	39.9	63.8
	Agree	58	27.1	27.2	91.1
	Strongly Agree	19	8.9	8.9	100.0
	Total	213	99.5	100.0	
Missing	System	1	.5		
Total		214	100.0		

Figure 46: If my phone doesn't have NFC, I am willing to buy a new one

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	2.8	2.8	2.8
	Disagree	13	6.1	6.1	8.9
	Neutral	50	23.4	23.5	32.4
	Agree	116	54.2	54.5	86.9
	Strongly Agree	28	13.1	13.1	100.0
	Total	213	99.5	100.0	
Missing	System	1	.5		
Total		214	100.0		

Figure 47: NFC will accelerate the checkout process in the supermarket

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.3	3.3	3.3
	Disagree	24	11.2	11.3	14.6
	Neutral	70	32.7	33.0	47.6
	Agree	87	40.7	41.0	88.7
	Strongly Agree	24	11.2	11.3	100.0
	Total	212	99.1	100.0	
Missing	System	2	.9		
Total		214	100.0		

Figure 48: I am interested to use NFC in other supermarkets

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	1.4	1.4	1.4
	Disagree	11	5.1	5.2	6.6
	Neutral	66	30.8	31.0	37.6
	Agree	105	49.1	49.3	86.9
	Strongly Agree	28	13.1	13.1	100.0
	Total	213	99.5	100.0	
Missing	System	1	.5		
Total		214	100.0		

Figure 49: Most people will be likely using NFC in the future

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	16	7.5	7.5	7.5
	Disagree	54	25.2	25.5	33.0
	Neutral	77	36.0	36.3	69.3
	Agree	57	26.6	26.9	96.2
	Strongly Agree	8	3.7	3.8	100.0
	Total	212	99.1	100.0	
Missing	System	2	.9		
Total		214	100.0		

Figure 50: I will use NFC if my friends or relatives uses it

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	2.8	2.9	2.9
	Disagree	72	33.6	34.3	37.1
	Neutral	78	36.4	37.1	74.3
	Agree	42	19.6	20.0	94.3
	Strongly Agree	12	5.6	5.7	100.0
	Total	210	98.1	100.0	
Missing	System	4	1.9		
Total		214	100.0		

Figure 51: I will not use NFC if my friends or relatives have security concerns regarding NFC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	9	4.2	4.3	4.3
	Disagree	33	15.4	15.7	20.0
	Neutral	71	33.2	33.8	53.8
	Agree	88	41.1	41.9	95.7
	Strongly Agree	9	4.2	4.3	100.0
	Total	210	98.1	100.0	
Missing	System	4	1.9		
Total		214	100.0		

Figure 52: I will use NFC if my friends or relatives find it useful

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	12	5.6	5.7	5.7
	Disagree	24	11.2	11.4	17.1
	Neutral	48	22.4	22.7	39.8
	Agree	98	45.8	46.4	86.3
	Strongly Agree	29	13.6	13.7	100.0
	Total	211	98.6	100.0	
Missing	System	3	1.4		
Total		214	100.0		

Figure 53: Storing my credit cards, tickets and coupons on my cell phone saves me from carrying several cards in my wallet

		Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Strongly Disagree	7	3.3	3.3	3.3
	Disagree	25	11.7	11.9	15.2
	Neutral	51	23.8	24.3	39.5
	Agree	95	44.4	45.2	84.8
	Strongly Agree	32	15.0	15.2	100.0
	Total	210	98.1	100.0	
Missing	System	4	1.9		
Total		214	100.0		

Figure 54: Storing my credit cards, tickets and coupons on my cell phone saves me from losing some cards

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	2.3	2.4	2.4
	Disagree	11	5.1	5.2	7.6
	Neutral	43	20.1	20.5	28.1
	Agree	118	55.1	56.2	84.3
	Strongly Agree	33	15.4	15.7	100.0
	Total	210	98.1	100.0	
Missing	System	4	1.9		
Total		214	100.0		

Figure 55: Using NFC will increase the speed of payment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	8	3.7	3.8	3.8
	Disagree	18	8.4	8.6	12.4
	Neutral	61	28.5	29.0	41.4
	Agree	91	42.5	43.3	84.8
	Strongly Agree	32	15.0	15.2	100.0
	Total	210	98.1	100.0	
Missing	System	4	1.9		
Total		214	100.0		

Figure 56: NFC will help me to better select the products I want to buy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	3.3	3.3	3.3
	Disagree	9	4.2	4.3	7.6
	Neutral	27	12.6	12.8	20.4
	Agree	127	59.3	60.2	80.6
	Strongly Agree	41	19.2	19.4	100.0
	Total	211	98.6	100.0	
Missing	System	3	1.4		
Total		214	100.0		

Figure 57: I can easily adapt to a new technology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	11	5.1	5.3	5.3
	Disagree	70	32.7	33.5	38.8
	Neutral	56	26.2	26.8	65.6
	Agree	56	26.2	26.8	92.3
	Strongly Agree	16	7.5	7.7	100.0
	Total	209	97.7	100.0	
Missing	System	5	2.3		
Total		214	100.0		

Figure 58: I will not use NFC if it is hard to learn

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	.9	1.0	1.0
	Disagree	20	9.3	9.6	10.5
	Neutral	48	22.4	23.0	33.5
	Agree	110	51.4	52.6	86.1
	Strongly Agree	29	13.6	13.9	100.0
	Total	209	97.7	100.0	
Missing	System	5	2.3		

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	.9	1.0	1.0
	Disagree	20	9.3	9.6	10.5
	Neutral	48	22.4	23.0	33.5
	Agree	110	51.4	52.6	86.1
	Strongly Agree	29	13.6	13.9	100.0
	Total	209	97.7	100.0	
Missing	System	5	2.3		
Total		214	100.0		

Figure 59: I will use NFC if it is simple

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	9	4.2	4.3	4.3
	Neutral	32	15.0	15.3	19.6
	Agree	125	58.4	59.8	79.4
	Strongly Agree	43	20.1	20.6	100.0
	Total	209	97.7	100.0	
Missing	System	5	2.3		
Total		214	100.0		

Figure 60: I will use NFC if it is quick

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	2.3	2.4	2.4
	Disagree	24	11.2	11.4	13.7
	Neutral	83	38.8	39.3	53.1
	Agree	79	36.9	37.4	90.5
	Strongly Agree	20	9.3	9.5	100.0
	Total	211	98.6	100.0	
Missing	System	3	1.4		
Total		214	100.0		

Figure 61: I want to use it as soon as the technology is possible

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	36	16.8	17.1	17.1
	Disagree	96	44.9	45.7	62.9
	Neutral	60	28.0	28.6	91.4
	Agree	12	5.6	5.7	97.1
	Strongly Agree	6	2.8	2.9	100.0
	Total	210	98.1	100.0	
Missing	System	4	1.9		
Total		214	100.0		

Figure 62: I will never use this technology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	.9	1.0	1.0
	Disagree	15	7.0	7.1	8.1
	Neutral	59	27.6	28.1	36.2
	Agree	100	46.7	47.6	83.8
	Strongly Agree	34	15.9	16.2	100.0
	Total	210	98.1	100.0	
Missing	System	4	1.9		
Total		214	100.0		

Figure 63: I will use it if it gives me discount

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	1.9	1.9	1.9
	Disagree	19	8.9	9.0	11.0
	Neutral	48	22.4	22.9	33.8
	Agree	109	50.9	51.9	85.7
	Strongly Agree	30	14.0	14.3	100.0
	Total	210	98.1	100.0	
Missing	System	4	1.9		

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	1.9	1.9	1.9
	Disagree	19	8.9	9.0	11.0
	Neutral	48	22.4	22.9	33.8
	Agree	109	50.9	51.9	85.7
	Strongly Agree	30	14.0	14.3	100.0
	Total	210	98.1	100.0	
Missing	System	4	1.9		
Total		214	100.0		

Table 38: I will use it when I do not have neither cash or debit card

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	1.9	1.9	1.9
	Disagree	15	7.0	7.1	9.0
	Neutral	58	27.1	27.6	36.7
	Agree	102	47.7	48.6	85.2
	Strongly Agree	31	14.5	14.8	100.0
	Total	210	98.1	100.0	
Missing	System	4	1.9		
Total		214	100.0		

Figure 64: I will use it when I'm in a hurry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	2.3	2.4	2.4
	Disagree	5	2.3	2.4	4.8
	Neutral	67	31.3	32.2	37.0
	Agree	101	47.2	48.6	85.6
	Strongly Agree	30	14.0	14.4	100.0
	Total	208	97.2	100.0	
Missing	System	6	2.8		
Total		214	100.0		

Figure 65: Eavesdropping

Data Modification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	.9	1.0	1.0
	Disagree	7	3.3	3.4	4.3
	Neutral	59	27.6	28.4	32.7
	Agree	106	49.5	51.0	83.7
	Strongly Agree	34	15.9	16.3	100.0
	Total	208	97.2	100.0	
Missing	System	6	2.8		
Total		214	100.0		

Figure 66: Data Modification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	1.9	1.9	1.9
	Disagree	9	4.2	4.3	6.2
	Neutral	53	24.8	25.5	31.7
	Agree	102	47.7	49.0	80.8
	Strongly Agree	40	18.7	19.2	100.0
	Total	208	97.2	100.0	
Missing	System	6	2.8		
Total		214	100.0		

Figure 67: Data corruption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	2.3	2.4	2.4
	Disagree	5	2.3	2.4	4.8
	Neutral	50	23.4	23.9	28.7
	Agree	100	46.7	47.8	76.6
	Strongly Agree	49	22.9	23.4	100.0
	Total	209	97.7	100.0	

Missing	System	5	2.3	
Total		214	100.0	

Figure 68: Interception of a third party

	1	2	3	4	H^2
I'm in favor of using my Smartphone as my wallet	.663	-.007	.085	.237	.554
I'm ok with storing my credit cards details on my cell phone	.661	-.126	.116	-.045	.532
If my phone doesn't have NFC, I am willing to buy a new one	.757	-.079	-.047	.063	.669
NFC will accelerate the checkout process in the supermarket	.770	.157	.046	.240	.684
I am interested to use NFC in other supermarkets	.805	.052	.157	.149	.764
Most people will be likely using NFC in the future	.648	.137	-.026	-.026	.518
I will use NFC if my friends or relatives uses it	.285	-.105	.357	.310	.631
Storing my credit cards, tickets and coupons on my cell phone saves me from carrying several cards in my wallet	.660	-.034	.166	.271	.645
Storing my credit cards, tickets and coupons on my cell phone saves me from losing some cards	.620	-.009	.268	.276	.578
Using NFC will increase the speed of payment	.604	-.001	.247	.076	.539
NFC will help me to better select the products I want to buy	.565	.076	.348	-.004	.534
I can easily adapt to a new technology	.287	.084	.056	.768	.703
I will not use NFC if it is hard to learn	.126	.145	-.086	-.438	.738
I will use NFC if it is simple	.149	.033	.269	.173	.786
I will use NFC if it is quick	.190	.009	.232	.327	.748

I want to use it as soon as the technology is possible	.391	-.012	.030	.561	.512
I will never use this technology	-.268	-.045	-.084	-.232	.486
I will use it if it gives me discount	.165	.089	.681	.036	.569
I will use it when I do not have neither cash or debit card	.019	.015	.726	.212	.656
I will use it when I'm in a , hurry	.348	.134	.744	-.125	740
Eavesdropping	.030	.750	.195	.097	.645
Data Modification	.011	.862	.020	.006	.761
Data corruption	.040	.850	.011	.017	.727
Interception of a third party	-.011	.892	.010	.021	.797