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Dissertation Research

Price Discrimination in-store, in mobility and in real-time

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ABSTRACT

Title: Price Discrimination in-store, in mobility and in real-time

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This dissertation focuses on the concepts of Mobility, Real-time Marketing and Price Discrimination, analyzing why it makes sense to study them together.

Boosted by the success of personalized offers in the e-commerce, the goal of this research is to understand if the market is prepared for real-time price discrimination by using smartphones.

A survey was conducted in order to gain some empirical knowledge, and the collected data was characterized regarding the research question and by using some descriptive statistics and cross tabulations.

The results showed that in the observed sample, customers are willing to use the mobile channel through a product barcode scanning process in order to get a discount.

These findings contribute with further insights into understanding how the mobile channel can be used by retail stores in order to bring additional sales for companies by reaching the most price sensitive customers.

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1 INTRODUCTION

1.1 OBJECTIVE

The focus of this dissertation is on people's willingness to engage in Real-time (RT) Price Discrimination (PD) where retailers can offer an in-store technological solution that allows offering promotions and discounts to customers in a personalized way. The goal of this research project is to merge Mobility, RT Marketing and PD and understand if the market (customers) is ready to accept this technological hypothesis.

This study is relevant because research has shown that the concept of mobility evolved to a stage where is no longer perceived as the action of moving between physical places, but remaining in constant contact with each other regardless location (Rosen, 2011). In addition, Real-time Marketing (RTM) stands for the individual needs of customers in space, and the continuous evolution of those needs in time (Oliver et al., 1998).

At this point it becomes interesting to study how these new mobile technologies can work along with the existing RTM solutions and influence customers' buying decision. At the same time, PD is a practice in which a seller sets prices based on the estimated buyer's willingness to pay (Hinz et al., 2011) which increases output and social welfare (Varian, 1985).

Past experience is the evidence that Information Technology (IT) advances have given online retailers an unprecedented ability to track and analyze customer behavior, promising valuable information about customers' preferences and greater insight into their true willingness-to-pay (Hinz et al., 2011).

On the other hand, by using customer browsing behavior to learn about aggregate and individual preferences, online retailers can personalize pricing through devices such as coupons, promotional pricing, and customized banner ads or pop-up windows (Shapiro and Varian, 1998). These advances in IT allowed discriminating price online. However, such was not possible in mobility because of a lack of technology.

Thus, it becomes interesting to understand what will happen when we merge mobility with RT and with PD, and understand if what happened online with e-commerce can also happen in mobility once there is already available technology to do it.

1.2 ASSUMPTIONS

For the purposes of this dissertation the following assumption is made: (1) the predictions for both Mobility and RT will become true.

In the context of this assumption, the predictions for mobility state that mobile platforms will hit critical mass and will be global (Murphy and Meeker, 2011) as the number of smartphone users in 2020 can reach 3 billion (Wong, 2010). Mobile devices will also evolve as remote controls for expanding types of RT cloud-based services empowering consumers in unprecedented and transformative ways (Meeker et al., 2009).

On the other hand, RT Business Intelligence (BI) infrastructures can leverage the power of data to meet organizational and customer's needs (Schroeck, 2000) and deliver value by enhancing customer experience (Vandemay, 2001).

Moreover, and also assuming that (2) People use smartphones and (3) there are real-time Customer Relationship Management (CRM) capabilities, the Research Question (RQ) addressed in this dissertation is the following:

R.Q.1. Is the market prepared for real-time price discrimination by using smartphones?

1.3 METHODOLOGY

The methodology used throughout this research is disposed in the following order:

(1) Adaptation of the e-commerce consumer model proposed by Helander and Khalid (2000) to the mobile context. The original version of this model is revised in the literature review chapter.

(2) Connecting the hypotheses below with the model referred in (1). The explanation on why these hypotheses can help to answer the research question is made in section 3.3.2.

H1. Adding or removing information to products influences buying decision and so it is possible to discriminate prices in function of that.

H2. The perception of buying speed is intrinsically related to discounts.

H2a. Customers can spend extra time in their shopping if they get a discount.

H2b. Customers are willing to scan the products systematically in-stores with their smartphones if they get a discount.

H3. Customers prefer personalized marketing communications even if it is done via mobile, but discounts provide leverage to the usage of this channel.

H4. Customers are not available to use the mobile channel if they feel it is not secure, even if they get a discount.

(3) Elaborating the questions for the survey out of the posed hypothesis. The questions are then used to conduct an online survey and collect primary data as an empirical support to verify the hypotheses.

(4) Analyze data regarding the research question. Once the data is analyzed and interpreted it is answered the research question and the main goal of this study is achieved.

1.4 STRUCTURE

The structure of this study is disposed as following:

Chapter 2 revises the fundamental theory, by over viewing the concepts under scrutiny (Mobility, RTM, PD and Helander and Khalid model), and by understanding why it makes sense to study them together.

Chapter 3 introduces the technological hypothesis proposed in this dissertation and explains the research methodology, the data collection process and the method used to make the analysis of the data.

Chapter 4 follows to discuss the results obtained through the online survey and the conclusions obtained.

Chapter 5 provides the final conclusion of the research.

2 STATE OF THE ART: LITERATURE REVIEW

2.1 INTRODUCTION OF THE CHAPTER

This chapter aims to provide a background overview on the theory that supports the remaining chapters of this research project and why it makes sense to study them together.

The three main themes approached in this chapter are: Mobility – one of the main subjects of the dissertation and the way it can influence the other themes, Real-Time Marketing (RTM) – its main drivers and the way it can interact with customers and enhance customer experience and, Price Discrimination (PD) – the reason for combining it with the other concepts.

Moreover, the E-commerce Consumer Model proposed by Helander and Khalid in 2000 is also overviewed, as it contributes with relevant theory that is applied later in this research.

This model interprets customer's behavior in an e-commerce environment and it serves as a base model in this dissertation, which allows extracting important pieces of information which are useful to answer the research question.

Thus, in this study, the hypotheses to answer the research question are built upon this model.

2.2 MOBILITY: A NEW CONCEPT

To start this section it is important to make a quick overview over the concept and definition of mobility. The goal is to understand how this concept has been evolving over time and the importance it has today both for individual users and for company businesses which are adapting their marketing strategies according to this new trend.

Mobility is present since ever, it is human's nature. Nomadic used it to move between physical locations long time ago. The concept evolved through time and the development of mobile communications and technologies led mobility to be perceived today as being in constant contact with each other regardless location (Rosen, 2011) and access and process information simultaneously while moving (Sun and Sauvola, 2002).

Moreover, it is also suggested that with the evolution of the concept of mobility it can now be achieved across the whole world and the ability to communicate is not contingent on being at the fixed physical location at a particular point in time and possesses the potential to be continuously maintained during a substantial physical movement from one location to another (Balasubramanian et al., 2002).

Additionally, the recent demands from the social market are leading to a boom on the development of mobile communications (Sun and Sauvola, 2002) and this may be the reason why the concept of mobility evolved so fast recently and, the reason for new emerging mobile scenarios such as:

1. **Service Mobility:** a personalized service is available to the user with one mobile device in one network but that same service can also be accessed in other device, network and location (Sun and Sauvola, 2002).
2. **Terminal Mobility:** is the ability of a device to roam with a network while it still reachable (Sun and Sauvola, 2002).
3. **User Mobility:** end-users can access personal services regardless of moving to any network or using any terminal, through unique user identification like a Universal Personal Telecommunication Number (Pandya, et al., 1997).

In the context of this dissertation it is crucial (1) to know the predictions for the usage of smartphones and (2) to underline the impact that those predictions may have on marketing, turning marketing strategies into mobile strategies.

2.2.1 PREDICTIONS

Many companies have been studying how the recent phenomenon of smartphones will evolve in the future and so they are making predictions on how the smartphones market will grow.

Nielson reports that 40% of adult US mobile phone owners have a smartphone as of July 2011, and the predictions is that by the end of 2011 it will become the majority. IMS Research expects 420 million smartphones will be sold in 2011 which represents 28% of the market but the predictions point to 1 billion in 2016 which means half of the whole market. IDC predictions point to 472 million smartphone sales across the globe in 2011 which can increase to 982 million in 2015.

Another company called Gartner is also making predictions in this area and they found out that from 2009 to 2011 smartphone sales grew 72,1% and is becoming the highest-selling consumer electronic device category.

These predictions point to a change in the way that people access to information and communicate. In the next section, the impact that these predictions may have on marketing strategies is analyzed.

2.2.2 IMPACT ON MARKETING

At the moment that people started carrying mobile devices (smartphones) in their pockets and increasing their mobility, the mass markets have fragmented and as a result impersonal mass communication has become less effective whereas targeted one-to-one marketing communications have become more important (Webster, 1992; Peppers and Dorf, 1999).

The question is that since 1960, firms have been adopting the marketing mix as its dominant design to develop marketing strategies (Leppäniemi and Karjaluoto, 2008) and so it is important to understand how firms can integrate and relate the mobile marketing with the overall firm communication strategy (Leppäniemi and Karjaluoto, 2008) or marketing mix.

First, it is important to define marketing mix, which is the set of controllable tactical marketing tools that the firm combines to produce the desired response among the target audience (Kotler et al., 2005 cited in Leppäniemi and Karjaluoto, 2008).

Second, it is important to define the concept that emerged later called Integrated Marketing Communications (IMC) which was defined as a concept of marketing communication that considers all forms of communication, all message delivery channels, customers and prospects, and all brand contact points, while they plan and implement marketing and marketing communication strategies (Kitchen et al., 2004).

Therefore, when relating mobility with the marketing strategy it is imperative to integrate all the firm's communication tools with all the communication channels of the firms in order to deliver a clear, consistent and compelling message about the company and its products (Leppäniemi and Karjaluoto, 2008). This means that the "mobile strategy" should

be integrated in the mobile channel of the firm marketing strategy instead of changing the whole strategy for the mobile concept.

2.3 REAL-TIME MARKETING: CONCEPT AND TECHNOLOGIES

It is also important to make a theoretical review on the concept of Real-time Marketing (RTM) and in what extent it can be related with mobility in order to understand the main goal of this dissertation.

RTM is defined as all the goods and services which are not only customizable to the individual consumer but they are also capable of adapting themselves over time (Oliver et al., 1998). Other authors define it as the logical conclusion resulting from powerful forces that have been transforming business and marketing from mass marketing to large segment marketing, niche marketing, and relationship marketing, and marketing to segments of one (Oliver et al., 1998).

Meanwhile, RTM demands a deeply change in organizations so that they can engage customers in an effective communication (McKenna, 1995) and RTM requires:

- ✓ Replacing the broadcast mentality by giving consumers access to the company, and to view their actions and feedback as integral to developing or improving products;
- ✓ Focusing on real-time customer satisfaction, providing the support, help, guidance, and information necessary to win customers' loyalty;
- ✓ Being willing to learn how information technology is changing both customer's behavior and marketing.

In the context of this dissertation and as the business focus of these technological solutions is interaction, RTM can be also called Interaction Management Technologies (IMT) because it has capabilities to make offers in real-time through one or more communications channels, and to monitor the effectiveness of these activities (Doyle, 2005).

After reviewing the broader and the narrow concept of RTM considering this dissertation context, it is also important to revise the concept of Customer Relationship Management (CRM) and Business Intelligence (BI) as:

“Marketing is becoming more of a battle based on information than based on sales power.”

(Kotler, 2000)

2.3.1 BUSINESS INTELLIGENCE (BI)

Effective business decisions depend on the acquisition, processing and utilization of relevant knowledge (Cooper, 1996 cited in Jimmy and Terry, 2004). Moreover, it is common sense that some information or knowledge is more valuable and sensitive than other information.

BI is defined as a set of concepts, methods and processes which help to improve business decisions, by using information from multiple sources and applying experience and adding assumptions to develop an accurate understanding of business dynamics (Brackett, 2001 cited in Jimmy and Terry, 2004). This same author also underlines that it is the gathering, management and analysis of data to produce information that is distributed to people throughout the organization that improves strategic and tactical decisions.

For the purposes of this research it is important to approach the concept of Data Warehousing which is a BI infrastructure that can help on a successful implementation of this technological proposal mainly in the support to a CRM system.

2.3.1.1 DATA WAREHOUSING

For one-to-one marketing communications it is very important to have knowledge about the customers in order to initiate and maintain relationships with them. The knowledge comes from information which comes from data and so there is a need to store the collected data about customers. DW allows accessing to multiple sources of data in Real-time (Doyle, 2005).

It is very important to manage knowledge by adding actionable value to information, capturing tacit knowledge and converting it to explicit knowledge (Nemati et al., 2002); on the other hand, it is also very important to have powerful infrastructures which are capable of enhancing knowledge management such as data warehouses.

Therefore, data warehousing can be defined as “subject-oriented, integrated, time-variant, non-volatile collection of data in support of management’s decision making process.” (Inmon, 1993 cited in Jimmy and Terry, 2004)

It is also said that a data warehouse is the ability of an organization to transact data between different databases coming up with an analytical view of historical information (Newman, 1999).

2.3.2 CUSTOMER RELATIONSHIP MANAGEMENT (CRM)

Many researchers have been studying CRM over the past decade (Hamid and Kassim, 2004) as it was identified by firms as a key success factor (Reinartz and Kumar, 2002) on managing customer relationships.

2.3.2.1 CRM DEFINITION

The main goal of a CRM system is to efficiently and effectively increase the acquisition and retention of profitable customers by selectively initiating, building and maintaining appropriate relationships with them (Payne and Frow, 2006). CRM is also suggested as a business strategy designed to optimize revenue and customer satisfaction which is able to organize firms around customer segments (Fayerman, 2002) or a traditional strategy to acquire new and profitable customers, improving the profitability of existing customers, and retaining the profitable customers (Kracklauer, 2001).

Meanwhile, literature says that these traditional strategies of CRM do not incorporate collaboration with customers to co-create value and as a result customer experience does not exist in this traditional process. Moreover, “the current problem with CRM is that it assumes that a company knows how to create value for customers” (Mascarenhas et al., 2004).

It is also important to say how technology has allowed the change in the traditional CRM strategies and created new channels to implement an evolution of a traditional CRM system. In the next paragraphs it is revised the concept of (1) Mobile CRM (mCRM) which emerges because of the new upcoming trend of social and mobile (Dickie, 2011); and (2) Virtual CRM (vCRM) which emerges because of the creation of Virtual Worlds as platforms to reach consumers where companies can create synergies between virtual and physical channels (Goel and Mousavidin, 2007).

In both cases there is the tendency to mistake the technology with the concept because both are deeply connected (Balasubramanian et al, 2002). This means that the difference between CRM and mCRM/vCRM is not the technology but the channel in which the technology is used, in this case is a mobile device. The communication between two parties facilitated by a device was called mediated interactivity (Hoffman and Novak, 1996).

2.3.2.2 MOBILE CRM - MCRM

Mobile devices perform the same function than other CRM channels; meanwhile, they have different characteristics (Sinisalo et al., 2006). Accordingly, mCRM is defined as the communication, either one-way or interactive, which is related to sales, marketing, and customer service activities conducted through the mobile medium for the purpose of building and maintaining customer relationships between a company and its customer (Sinisalo et al., 2006).

The specific characteristics of the mobile medium lead to the personalization of communication because generally, one mobile phone belongs to one person (Sinisalo et al., 2007). This fact, allows serving loyal customers on a personal and individual basis, sending relevant and time-sensitive information which may strengthen the emotional relationship between the company and its customers (Nysveen et al, 2005).

2.3.2.3 VIRTUAL CRM -VCRM

The evolution of technology allowed the creation of Virtual Worlds platforms which became an important channel for reaching a wide consumer base and to interact with them in a way that was not possible before (Goel and Mousavidin, 2007).

The vCRM allows companies to interact with costumers and co-create physical products and services with them which allow gaining feedback in a much richer way than traditional means (Goel and Mousavidin, 2007). The same authors also say that the presence and interaction in virtual worlds increase brand visibility and facilitate marketing to a new customer base and the experience of being part of this process also promotes a sense of buy-in from the customers towards the products or service.

The self-expression of an individual in the virtual world allows the company to know better their customers (Goel and Mousavidin, 2007) and there is an increase value of the

customer having an active role throughout the value chain which is proved by prior studies (Fournier and Mick, 1999; Keiningham et al., 1999).

Involving customers in the value chain process is an alternative to the traditional linear value chain approach to a value chain network in which customers are linked through layered and interconnected networks (Roberts, 1999). It is a social environment which contributes to social innovations and co-created value (Ramirez, 1999).

For the conceptualization of mCRM and vCRM it was very important the insights gained with what happened in the e-commerce and the respective implementation of electronic CRM (eCRM). Electronic CRM (eCRM) takes into account the online interaction via websites based on the role of customers in the communication process with firms (Romano and Fjermestad, 2002). In eCRM the data can be collected passively (e.g. through cookies), actively (e.g. through internet surveys), or interactively (e.g. through interactive online interviews).

The eCRM models collect customer data by interacting and adding value and by focusing on personalized one-to-one relationships with customers (Parvatiyar and Sheth, 2002).

2.3.2.4 PERMISSION MARKETING

The permission marketing concept is related with the fact that customers that give the permission to companies to inform them about products are more willing to listen to these companies and as a result, these companies can tailor their messages and offer what is more valuable to those customers leading to a higher receptivity for future communications (Arias Terry, 2000).

Further literature, defines permission marketing as an evolution of direct marketing that uses databases of customers that accept low-cost and customized marketing messages to attract increase customer support and change behavior (Tezinde et. al, 2002). These same authors also say that customers deliberately allow receiving commercial messages but they can stop this permission relationship at any time.

For an effective mobile marketing campaign the company must deliver relevant, demanded and interactive content to the customer and privacy issues must be respected with clear instructions to opt-in and opt-out (Kavassalis et. al, 2003).

These authors also state the permission relationships may increase loyalty and frequency what involves a complex marketing strategy and competencies to permanently obtain broader permissions.

In the context of this dissertation the importance of understanding permission marketing stands for the fact that this technological proposal interacts not with all the customers but only with the ones that deliberately use it.

2.3.2.5 CONTEXTUAL MARKETING

Contextual Marketing is the use of Internet to make available relevant information to customers in the right place at the right moment and in real-time (Kenny and Marshall, 2000). Contextual marketing is important because users are already information-overloaded (Lou and Seyedian, 2003).

It is also said that Contextual Marketing provides companies with more tools to communicate with their customers and more opportunities to better make the most of those relationships (Lou and Seyedian, 2003) leading in superior customer relationship management, loyalty and repeated purchases (Lou and Seyedian, 2003).

These authors also say that Contextual marketing can be a source of competitive advantage as it allows having more efficient targets of marketing segments, and also because today's society highly values time, and so customers are willing to pay higher prices for relevant products if they save time searching for information.

2.4 PRICE DISCRIMINATION

This section revises the literature on Price Discrimination, its concept and definition, as well as its various forms to reach customers such as Bundling, Versioning, Price-Matching etc.

Today it is very common for firms to segment their customers according to price sensitivity so that they can discriminate prices and increase profits (Stole, 2003). This is a process in which firms seek to price their wares as a function of each consumer's underlying demand elasticity, extracting more surpluses and increasing sales to elastic customers in the process (Stole, 2003).

There are three types of price discrimination. However, in the context of this dissertation only the third degree is analyzed because of its characteristics that better serve the purpose of this research.

In the third degree of PD, price varies according to customer's location or segment (Pigou, 1920). Recently, another name called Micromarketing surged as a new definition of third degree PD (Montgomery, 1997).

Micromarketing is the customization of marketing mix elements to the store level instead of having the same policy for all the stores what reflects a desire by managers to retain the cost savings and marketing clout of large national and regional chains while developing more customer-oriented strategies that cater to neighborhood markets (Montgomery, 1997).

Meanwhile, a micromarketing strategy can be difficult to design because "unless the chain is disciplined, individual stores will vary greatly on pricing and merchandising, destroying overall image and positioning. Therefore, the major cost for a chain is the management effort to reconcile store autonomy with presenting a uniform image to customers (Blattberg, 1988)." This problem could be solved by sharing data across the all stores (Gupta, Porter, and Wittink, 1993).

The forms of third degree PD used for the purposes of this research are Bundling, Versioning and Price Matching as this technological proposal demands CRM capabilities which can later be used to deliver personalized offers and discounts in any of these forms.

2.4.1 BUNDLING

Literature on this subject makes the distinction between price bundling and product bundling. It is suggested that price bundling is the practice of selling two or more separate products or services in a package at a special price or discount, independently of the integration of the products in the bundle (Gultinan, 1987; Simonin and Ruth, 1995; Stremersch and Tellis, 2002).

In contrast, product bundling is the integration and sale of two or more separate products that can be offered at any price (Stremersch and Tellis, 2002) and it is considered to be a marketing strategy that creates value by packaging complementary or related products (Harris and Blair, 2006; Sarin et al., 2003).

The benefits of bundling products is that the bundle transfers the consumer's surplus of one item to the other items of the bundle making the overall bundle to have positive consumer utility.

Other researchers say that consumers may view the bundled items as complementary what leads to a higher valuation of the bundle than the sum of the individual value of the item. Therefore, it is reflected in a positive incentive to purchase the bundle (Venkatesh and Kamakura, 2003).

2.4.2 VERSIONING

Versioning is considered to be the smart way to sell information (Varian and Shapiro, 1998), i.e., information goods, which are defined by these authors as goods capable of being distributed in digital form and have a distinctive cost structure: producing the first copy is often very expensive, but producing subsequent copies is very cheap.

Because Versioning is about selling information it is not possible to set a cost-based pricing strategy for information goods but instead, a price according to the value a customer places information (Varian and Shapiro, 1998). The problem of this strategy is that the value of information varies dramatically from person to person and so the ideal would be setting individual prices to each individual customer according his/her valuation of information (Varian and Shapiro, 1998).

In the context of this dissertation, Versioning follows to be relevant as the technological hypothesis presented allows adding valuable layers of information in retail products and, in function of that versioning can be used as a smart way to discriminate prices.

2.4.3 PRICE MATCHING

This literature suggests that “price-matching policies are means to reduce price competition allowing firms offering such policies to charge higher prices” (Salop, 1986). It is also suggested that a price matching policy is strategy to discriminate price that allows retailers to identify customers based on a search cost (Png and Hirshleifer, 1987).

Giving a price-matching guarantee is a way that companies use to communicate its low prices to uninformed consumers (Jain and Srivastava, 2000; Moorthy and Winter, 2006).

However, consumers that may have high time costs are unable to monitor prices and service in the market and so they cannot distinguish between different retailers using a price-matching refund policy (Moorthy and Winter, 2006). On the other hand, consumers that may have low time costs can do the opposite and so distinguish between different retailers using this strategy.

2.5 THE E-COMMERCE CONSUMER MODEL

The e-commerce consumer model (Fig.1) proposed by Helander and Khalid (2000) consists of three subsystems: Web Environment (WES), Customer (CS), and Web Technology (WTS).

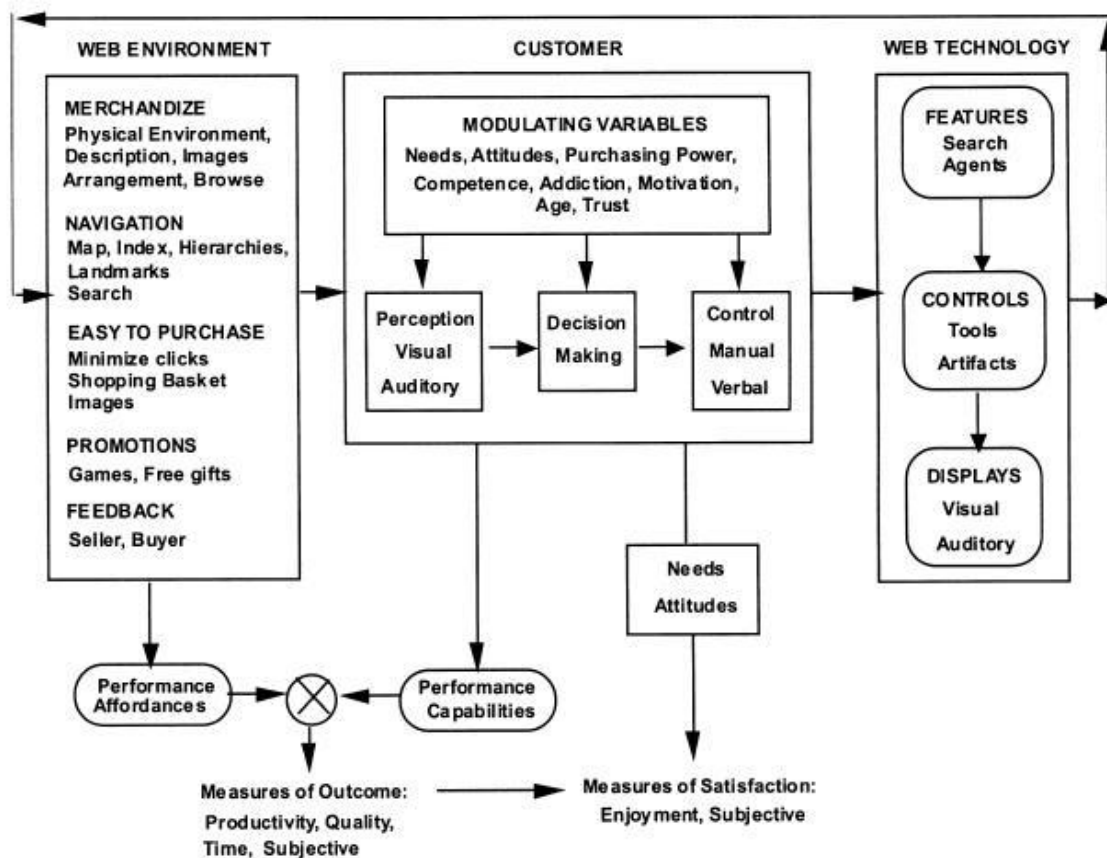
Moreover, there is a circular relationship between the subsystems of this model, meaning that WES impacts on CS which controls WTS and WTS determines what is available for use and implementation in WES (Helander and Khalid, 2000).

The arrows in the Fig.1 show the direction of information in this model. The model is dynamic and it must be conceptualized as a series of decisions potentially leading to a purchase and payment (Helander and Khalid, 2000).

It is seen in Fig. 1 that the customer is of central interest and this is because the action takes place at the user initiative (Vora, 1999, cited by Helander and Khalid, 2000).

The CS includes three phases related to human information processing: *Perception* (of the details in the store), *Decision Making* and *Control* (action). These processes are modulated by different characteristics of the customers such as individual needs, attitudes, competence and motivation. These different characteristics explain the differences in shopping behaviors of the customers (Helander and Khalid, 2000).

Figure 1- E-commerce Consumer Model



Source: Helander and Khalid, article

The WES, as Fig. 1 illustrates, relates to measures of outcome that intend to analyze the decision to purchase.

The decision to purchase is made as a result of a series of decisions: (1) the decision to visit, (2) the decision to navigate, (3) the decision to buy, (4) the decision to pay, and (5) the decision to keep. These set of decisions are affected by a variety of factors such as price, merchandize, interface and trusting environment (Helander and Khalid, 2000). Each of these factors should be supported by information that can facilitate efficient decision-making.

The WTS refers to technological features both in browsers and in the store environment that may have a sensorial impact on customers. For example, search filters options, price comparisons or auditory display (Helander and Khalid, 2000).

2.6 CONCLUSION OF THE CHAPTER

In this chapter, the needed theory applied along this dissertation was overviewed.

The evolution of the concept of mobility has an impact on marketing strategies, at the same time, that real-time infrastructures can leverage the power of data and make information easily accessible.

On the other hand, Price Discrimination increases output and social welfare by extracting extra surplus from the most price sensitive customers.

The next chapter presents the technological hypothesis of this study as well as the research methodology that is used to explore it.

3 TECHNOLOGICAL HYPOTHESIS, RESEARCH METHODOLOGY AND DATA COLLECTION

3.1 INTRODUCTION OF THE CHAPTER

The new concept of mobility along with the predictions for the use of smartphones (revised in the literature review chapter), lead to a new market opportunity.

Hence, this study aims to contribute with a technological hypothesis built upon this new mobile context and allied with two other concepts, namely, Price Discrimination and Real-time Marketing.

In this chapter, the technological hypothesis of this research is introduced. First, an explanation on why this study proposes this technology, what the technology is and, what the technology does.

Finally, the methodology used to answer the research question is explained in section 3.3. The rationale behind the chosen methodology is exposed in the following way: (1) why it makes sense to pose the referred research question (Is the market prepared for real-time price discrimination by using smartphones?); (2) the research model that is used to explore the dimensions of the problem statement; (3) the hypotheses that come from the research model in order to explore its dimensions; (4) the collected data that is used as an empirical support to verify the hypotheses and answer the research question.

3.2 TECHNOLOGICAL HYPOTHESIS

This section presents the technological hypothesis of this research, explains its fruitfulness to study and describes its functionality.

3.2.1 WHY THIS TECHNOLOGICAL HYPOTHESIS?

This proposal emerges as a consequence of connecting the dots, i.e., price discrimination was succeeded in e-commerce at the same time that it allowed, through web, to collect individual data from costumers, leading mass marketing campaigns to one-to-one marketing communications.

Moreover, the evolution of the concept of mobility, as revised in the literature chapter, establishes a new paradigm of communication, meaning that people are now accessible everywhere regardless location. Along with that, technological evolution allowed the development of new mobile equipment as a natural adaptation to a change in the mobile context.

As a result, cell phones are no longer call-making and message-sending devices, but mini computers with internet access, cameras etc that we call smartphones.

In a moment where it is possible to have ubiquitous internet in phones, it is pertinent to think if about the possibility of bringing the e-commerce experience to the mobile environment and, to price discriminate the mobile customers.

Bringing these concepts and trends together gave birth to this technological hypothesis.

3.2.2 WHAT IS THE TECHNOLOGICAL HYPOTHESIS?

The inclusion of powerful micro-processors in these devices (smartphones) allowed running new types of operative systems specifically designed for these devices such as Android and iOS, which give the possibility to install and run what we called applications or apps.

Apps created a new mobile channel for companies to interact with customers as they can use these apps as a vehicle to deliver real-time content.

The technological proposal of this research is a smartphone app that can be applied to retail stores and work as an interactive promotional platform between the company and its clients. The app of the presented technological hypothesis is designed to enhance customer experience in retail stores at the same time that it has the ability to discriminate price in real-time and in a personalized way, according to the customers' shopping habits.

When the app is downloaded and installed in the smartphone, the customer is ready to use it. Once the user runs the app he/she is asked to login (or register) with his/her number of client of the store in order to benefit from discounts. At this point, the user gives permission to the company to send offers and discounts.

Additionally, because the user logged in (or registered) the company knows when the customer is in the store using the app, and so it can initiate a one-to-one communication with this customer.

Moreover, the app also creates a new channel of communication between firms' data warehouses, CRM systems and the customer. This means that the company has now the ability to offer in mobility all kind of discounts in a personalized way and in an individual basis.

This fact increases the effectiveness of the offer and leads to a clearer and compelling message delivery as well as an increase in satisfaction and loyalty.

3.2.3 WHAT IS THE FUNCTIONALITY OF THE TECHNOLOGICAL HYPOTHESIS?

This technological hypothesis allows scanning the barcodes of the products by using the smartphone camera. As the firm knows who is the customer that is scanning the product, it can deliver a discount to that customer in real-time.

Therefore, this technological hypothesis allows:

1. Scanning the barcodes of the products: with the development of barcodes and QR codes is now possible to add new layers of information to products. This app allows reading any type of these codes redirecting customers directly to a virtual world where discounts are offered.



2. Virtual World: Once the barcode/QR code is read the user enters in a virtual world where he/she can browse and look for other users opinions on that product. Moreover, the user can also post own opinions and share on social networks. The greater the interaction with the virtual world is, the higher is the discount, meaning that if a user posts an opinion he gets a higher discount and if he posts an opinion and share on social networks he gets even a highest discount.



3. Bundling, Versioning and Price-matching: Since the technological hypothesis allows communication between the firm's Business Intelligence infrastructures and the user, it is possible for the firm to use its CRM as a source for price discrimination, personalizing offers and price according to each customer shopping habits. Therefore, different customers can be given different types of offers and discounts.

3.3 RESEARCH METHODOLOGY

To answer the research question, the methodology used in this study was based on a research model that is adapted from the e-commerce consumer model proposed by Helander and Khalid (2000).

This model was redefined and adapted to the mobile context allowing the creation of important dimensions that aim to study customers' willingness to engage in this technological hypothesis, by understanding the relationships that may lead customers to use the mobile channel or not.

Each dimension of the model is related to one particular subject that allows gathering pieces of information that help to understand the referred relationships. Those pieces of information are analyzed through posed hypotheses.

The methodology also includes an online survey where its questions are formulated according to the information that it is needed to know to verify the hypotheses.

The data collected is interpreted, analyzed and used as an empirical evidence to support the hypotheses.

Once the hypotheses are verified the research question is answered and the main goal of this research is achieved.

3.3.1 RESEARCH MODEL

In order to answer the research question, this study uses an adaptation of the E-Commerce Consumer Model proposed by Helander and Khalid (2000), and revised in the literature chapter.

3.3.1.1 ADAPTATION OF THE E-COMMERCE CONSUMER MODEL

The need for this adaptation emerges because the technological hypothesis of this dissertation involves a mobile context and, although one of the goals of this research is to prove that what happened with price discrimination in e-commerce can also happen in m-commerce, the technology involved and the environment are different and so other aspects have to be considered such as the smartphone use instead of a website use.

The adaptation made in this model starts with a redefinition of the subsystems of the E-commerce Consumer Model:

(1) Mobile Environment Subsystem (MES) instead of a Web Environment Subsystem (WES).

The WES intends to study the *Decision to Purchase* and this decision is the result of a series of 5 decisions (as revised in literature). In the context of this dissertation the subsystem redefined to a MES and it intends to study the *Decision to Get a Discount*, and this decision is the result of a series of decisions: the decision to scan, the decision to navigate, the decision to interact, the decision to buy and the decision to pay.

In order to study these decisions the MES includes four dimensions: Merchandise, Ease of Purchase, Promotions and Feedback. Additionally, Merchandise analyses two variables: Information Quality and Information Quantity. These dimensions are the same in the WES; the difference is that the collected data used to analyze the dimensions is approached using a mobile perspective. The goal of these dimensions is to understand in what extent the mobile environment impacts customers' shopping behavior in terms of how they value and perceive information, discounts, buying speed, one-to-one communication and personalization of offers (CRM).

(2) Customer Subsystem (CS) is not redefined as it already fits the purposes of this dissertation. However, the variables that test the dimensions of this subsystem are different from the ones in the original model. This happens because in the context of this study it is needed specific information to answer the research question and so it is needed to introduce specific variables.

Those variables are Satisfaction, Security and Price Sensitivity. The intention of this subsystem is to understand how the dimensions of the MES can influence customers' feelings in the mobile channel.

(3) Mobile Technology Subsystem (MTS) instead of a Web Technology Subsystem (WTS).

The WTS intends to study the *Technological Features* both in browsers and in the store environment that may have a sensorial impact on customers (search filters, price comparisons etc.)

For this research, the WTS is redefined to a MTS and it intends to study *Interaction*, through technological features that are included in the technological hypothesis, and that allow the users to interact with a virtual world. Depending on the level of interaction, the user may get a higher or lower discount.

Hence, the dimension of this subsystem is Sensory Impact as it tests if the technological features that allow different levels of interaction, have in fact, consequences in the way that customers will use the presented technological hypothesis.

3.3.2 HYPOTHESIS THAT ANALYZE THE RESEARCH QUESTION

The answer to the research question is the result of gathering different pieces of information.

In the context of this dissertation, it is important to know: (1) if customers are price sensitive and as a result they value discounts; (2) if customers are willing to interact with the mobile channel in order to get the discount; (3) if the product scanning process is a constraint for them in terms of time spent during their shopping; (4) if customers value personalized offers rather than generalized offers; and (4) if the security in the mobile channel is a factor of decision.

Therefore, in order to research this information, this study poses the following hypotheses:

H1. Adding or removing information to products influences buying decision and so it is possible to discriminate prices in function of that.

The technological hypothesis of this research allows adding or removing layers of information to products. Hence, knowing at what extent information affects customers' buying decision can be important as a source for price discrimination.

H2. The perception of buying speed is intrinsically related to discounts.

In the context of this research it makes sense to analyze customers' perception of the buying speed.

H2a. Customers can spend extra time in their shopping if they get a discount.

If costumers have to spend extra time in their shopping because they are using this technological proposal they may not like and not adopt it. This hypothesis tests if the given discounts can solve the problem of time spent.

H2b. Customers are willing to scan the products systematically in-stores with their smartphones if they get a discount.

This hypothesis tests if the constraint of scanning the products systematically in-stores can be solved by offering people a discount.

H3. Customers prefer personalized marketing communications even if it is done via mobile, but discounts provide leverage to the usage of this channel.

This hypothesis tests the importance of including a CRM system in this technological proposal as a key factor for its success. The scope of this hypothesis includes customers' preference for offers based on past shopping behavior, personalized prices and customers' satisfaction increments because of a personalized service.

H4. Customers are not available to use the mobile channel if they feel it is not secure even if they get a discount.

This hypothesis tests the importance that a safe environment has on customers' availability to use the mobile channel, measuring that importance with the inclusion of a discount.

These Hypotheses come from the research model and they are related in the following manner:

- ✓ Hypothesis 1 relates to the Merchandise dimension of the MES of the model and also with the MTS of the model.
- ✓ Hypothesis 2 is divided into two parts H2a and H2b. They both relate to the Ease of Purchase dimension of the MES of the model.
- ✓ Hypothesis 3 relates to the Satisfaction and Price Sensitivity dimensions of the CS of the model as well as to the Promotions and Feedback dimensions of the MES of the model.
- ✓ Hypothesis 4 relates to the Security dimension of the CS of the model.

3.4 DATA COLLECTION

To study the dimensions of the model a set of hypotheses were posed and the necessary data to test them was collected through an online survey that was conducted in November 2011, via an external online survey tool¹.

The conducted survey managed to access a total of 150 individuals through a Facebook group that was created, and where the link of the online survey was posted. It was asked people to contribute with their help and no monetary incentives were given.

A total of 356 people were contacted but only 150 actually accessed it. Of these, 135² (90%) started the survey and 103 (76,3%) fully completed the questionnaire.

Therefore, the number of observations considered in the analysis was 103 individuals of which 56 are *male* (54%), 47 are *female* (46%) and from these, 64 belong to the 21-23 *age group* (60%).

With the results of the survey a statistical analysis was done in order to interpret the results, verify the hypotheses and answer the research question.

¹ Website: <http://www.questionpro.com> – Question Pro – Online Research Made Easy

² Appendix I – Research Method and Profiling of Respondents

3.4.1 VARIABLES

The Table 2 below shows a summary of the variables used for the analysis. The survey questions³ allowed gathering the necessary data for each variable considered below.

Table 1 – Variables used in the analysis

<i>Dependent Variables</i>	
Discounts	
Scanning the barcode of Products	
<i>Independent Variables</i>	
Layers of Information	
Perception of Buying Speed	
Satisfaction	
Security	
<i>Control Variables</i>	
Demographic and Socioeconomic	Motivational
Gender	Price Sensitivity
Age	Information
Geographic Residence	Price
Perceived monthly income	Time Spent per purchase
Smartphone owner	Total Time Spent
Frequency of apps download	Permission Marketing allowed
Frequency of app use	Permission Marketing not allowed
-	Interaction
-	Privacy and Security

Source: Author

Dependent Variables

The dependent variables comprise *Discounts* and *Scanning the barcode of Products* which their importance for people acceptance of the mobile channel is measured in terms of how

³ Appendix II – Survey Questions

varying the amount of the discount will influence peoples' buying decision and how far are people willing to go and scan to get the highest discount.

Independent Variables

- a) Layers of Information – this variable identifies those users who are willing to add or remove layers of information to products in order to have the highest discount or the lowest price, respectively, and have to use their smartphones to do it. This variable is tested by questions 12 and 13 of the survey⁴.

- b) Perception of Buying Speed – this variable identifies those customers who are willing to spend extra time in their shopping to get the highest discounts. This variable is tested by questions 14 and 15 of the survey.

- c) Satisfaction – this variable identifies those customers who are willing to lose some satisfaction in their shopping but in exchange they will get personalized offers and higher discounts. This variable is tested by questions 16, 17 and 18 of the survey.

- d) Security – this variable identifies those customers who will abandon the mobile channel if they feel that privacy and security issues are in danger. This variable is tested by question 19 of the survey.

Control Variables

There are two sets of control variables, the set of demographic and the set of motivational variables. The demographic set of control variables consist of *Gender* (Male=1, Female=2); *Age* (<18=1, 18-20=2, 21-23=3, 24-26=4, 27-29=5, 30-35=6, >35=7); *Geographic Residence* (North of Portugal=1, Center of Portugal=2, South of Portugal=3, Other Country=4); *Perceived Monthly Income* (Very Low=1, Low=2, Medium=3, High=4, Very High=5); *Smartphone Owner* (Yes=1, No=2); *Frequency of apps download* (Never=1, Rarely=2, Sometimes=3, Often=4, Very Often=5); *Frequency of app use* (Never=1, Rarely=2, Sometimes=3, Often=4, Very Often=5).

⁴ Appendix II – Survey Questions

The set of motivational control variables consist of *Price sensitivity* (200€=1, 450€=2, 600€=3, 800€=4); *Information* (Add to Kart=1, Add to Kart + Post opinion about the product=2, Add to Kart + Post opinion about the product + Share on social networks=3); *Price* (Add to Kart=1, Add to Kart + Get access to detailed information about the product=2, Add to Kart + Get access to detailed information about the product +Add product insurance=3); *Time Spent per purchase* (scanning the product-time spent 15 seconds-Price 2,1€=1, not scanning the product-time spent 5 seconds-Price 2,9€=2); *Total Time Spent* (scanning all the products-time spent 2h-Savings 70€=1, scanning half of the products-time spent 1,5h-Savings 30€=2; not scanning the products-time spent 1h-Savings 0€=3); *Permission Marketing allowed* (Scanning the products-total discounts 25€=1, Not scanning the products; total discounts-10€=2); *Permission Marketing not allowed* (Scanning the products-total discounts 10€=1, Not scanning the products; total discounts-0€=2); *Interaction* (You buy everything on your own-Overall Satisfaction-50%-Discounts 20€=1; You buy with the help of a store employee-Overall Satisfaction 100%-Discounts 20€=2; You buy using the presented app-Overall Satisfaction-75%-Discounts 50€=3); *Privacy and Security* (Buy the product with discount=1, Not buy the product even with the discount=2).

3.5 METHOD TO ANALYZE THE COLLECTED DATA

In order to have a consistent sample only the respondents who fully completed the survey were included in the analysis. Hence, the analysis comprises 103 observations.

The method used to analyze the data has three phases:

(1)Characterize the collected data according to the answers given in the survey, by showing the results of the demographic, socioeconomic and motivational control variables in terms of percentages. The purpose of this characterization is to create a profile of the sample.

(2)Segment the data according to the given answers in order to determine the representativeness of the independent variables in the sample.

To do that, the questions of the survey which are related to each independent variable ⁵ are grouped. Then, it is summed the number of positive answers for each independent variable which are later weighted with the total of answers, in order to have the percentage of positive responses for each independent variable. That is considered the representativeness of the independent variable in this sample.

(3) Analyze the price sensitiveness of the sample and cross it with the results of the survey.

(4) Cross the profile of the sample with the research model, by finding relationships between the motivational control variables that can explain the association between the independent variables and the dependent variables.

To perform the fourth phase it is used statistical software⁶ to run some crosstabs between the motivational control variables. These allow finding some correlations and better understand and explain how the dependent variables (discounts and scanning) can contribute to a positive effect in the independent variables.

Therefore, the dependent variables (Discounts and Scanning) are assessed using the following crosstab models:

- **CT Model 1** – The model comprises the motivational control variables *Information* and *Total Time Spent*. The intention is to understand how the motivational control variables influence the dependent variables.
- **CT Model 2** – The model comprises the motivational control variables *Price* and *Time Spent per Purchase*. The intention is to understand how the motivational control variables influence the dependent variables.
- **CT Model 3** – The model comprises the motivational control variables *Permission Marketing Allowed* and *Interaction*. The intention is to understand how the motivational control variables influence the dependent variables.

Those correlations are then interpreted and crossed with the posed hypotheses so that they can be verified and finally answer the research question.

⁵ Refer to the Independent Variables, Research and Methodology Chapter, Page 24

⁶ SPSS – Statistical Package for Social Sciences

3.6 CONCLUSION OF THE CHAPTER

This chapter introduced the technological hypothesis of this study as well as the methodology used in order to research and develop this subject.

The next chapter follows to analyze and discuss the results of the survey and make the intermediary conclusions, which serve as a support to accomplish the main goal of this dissertation: answer the research question.

4 ANALYSIS AND DISCUSSION OF THE RESULTS

4.1 INTRODUCTION OF THE CHAPTER

In this chapter, the results from the survey are interpreted and from each interpretation an intermediary conclusion is made.

Those intermediary conclusions are then used in the discussion and crossed with the posed hypotheses in order to check if the empirical knowledge provided by the results of the survey, can support the hypotheses and answer the research question.

4.2 ANALYSIS OF THE RESULTS

To start this section the collected data is characterized in order to come up with a profile of the sample. Then, the independent variables are analyzed regarding the profile of the sample and its representativeness is determined.

Finally, the dependent variables (Discounts and Scanning) are assessed by finding the relationships between the motivational control variables through a crosstab statistical process.

4.2.1 DATA CHARACTERIZATION

The results below have a 95% probability to be part of the presented confidence interval⁷.

From the sample of 103 observations, 89 of the individuals live in the *center of Portugal* (83%) and the most part of their level perception of the monthly income varies between *low*, 41 individuals (39%) and *medium*, 48 individuals (45%).

Moreover, 55 individuals (53%) *own a smartphone* and from the 48 individuals (47%) who do not own a smartphone, 19 (40%) are thinking about buying one in a near future and 29 (69%) are not.

⁷ Appendix I and Appendix III – Confidence Interval section of the table

In terms of *price sensitivity*, 46 individuals (45%) consider the iPhone 4S to be expensive at a price of 600€, 97 individuals (94%) consider the iPhone 4S to be cheap at a price of 200€ and 56 individuals (55%) just consider to buy the iPhone 4S if the price was 450€.

Regarding *information, price and total time spent*, 50 individuals (49%) are willing to post opinions and share on social networks to get the highest discounts, 62 individuals (60%) prefer simple versions of the products in order to get the lowest price and 75 individuals (73%) are willing to scan all the products in order to get the highest shopping savings.

Furthermore, 66 individuals (64%) prefer a virtual interaction in-store (using the technological hypothesis of this study) instead of a personal interaction (with the help of a store employee) if they get a higher discount. This happens even if using the mobile channel means a decrease of 25% in satisfaction.

Finally, 59 individuals (57%) are not willing to use the mobile channel if they feel that there is a lack in security and privacy issues, independently of getting a discount or not.

These results from the motivational control variables are directly connected with the independent variables and are useful for determining the representativeness of the sample.

4.2.2 REPRESENTATIVENESS OF THE INDEPENDENT VARIABLES

The independent variable *Layers of Information* has associated the motivational control variables *Information* and *Price*. The most positive answers for these variables are “*Add to Kart + Post opinion about the product + Share on social networks*” and “*Add to Kart + Get access to detailed information about the product + Add product insurance*”, respectively. The number of responses for the most positive answer in *Information* was 50 and for *Price* were 62. Hence, the representativeness of the independent variable *Layers of Information* is 54,37%⁸.

Regarding the independent variable *Perception of the Buying Speed* the associated motivational control variables are *Time Spent per Purchase* and *Total Time Spent*. The most positive answers for these variables are “*scanning the product - time spent: 15*

⁸ $((50+62)/206)*100$

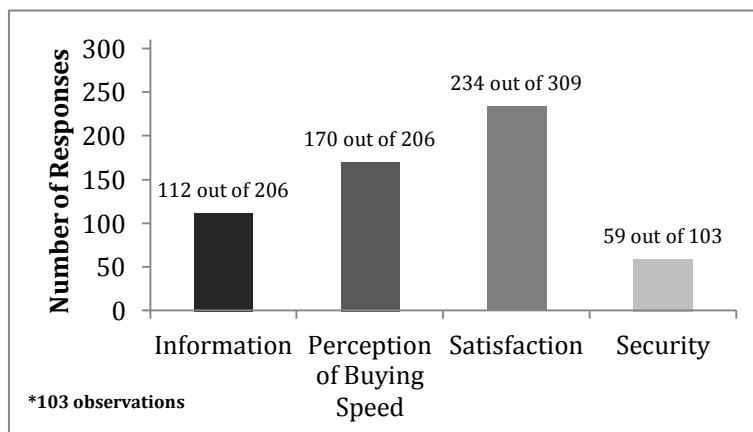
seconds – Price: 2,1€” and “scanning all the products - time spent: 2h – Savings: 70€”, respectively. The number of responses for the most positive answer in *Time Spent per Purchase* was 95 and for *Total Time Spent* were 75. Therefore the representativeness of the independent variable *Perception of Buying Speed* is 82,52%.

The independent variable *Satisfaction* has associated the motivational control variables *Permission Marketing allowed*, *Permission Marketing not allowed* and *Interaction*. The most positive answers for these variables are “*Scanning the products - total discounts: 25€*”, “*Scanning the products - total discounts: 10€*” and “*You buy using the presented app - Overall Satisfaction: 75% - Discounts: 50€*”, respectively. The number of responses for the most positive answer in *Permission Marketing Allowed* was 90, for *Permission Marketing not allowed* were 78 and for *Interaction* were 66. Therefore, the representativeness of the independent variable *Perception of Buying Speed* is 75,73%⁹.

Finally, the independent variable *Security* has associated the motivational control variable *Privacy and Security*. The most positive answer for this variable, taking into account what was established earlier in Hypothesis 4, is “*Not buy the product, even with the discount*” and its number of positive responses was 59. Therefore, the representativeness of the independent variable *Security* is 57,87%.

The table below shows the number of positive answers for each independent variable.

Chart 1 - Representativeness of the Independent Variables



Source: Author

⁹ $((90+78+66)/309)*100$

Across this sample of 103 observations these variables have an overall representativeness of 67,48% (average of the four independent variables).

From this section it is possible to make the first intermediary conclusion: **(1)** the effect, which the dependent variables *Discounts* and *Scanning*, measured by the motivational control variables, have on the independent variables, shows a positive representativeness of 67,48%, what indicates a considerable positive acceptance of the technological hypothesis of this study.

4.2.3 PRICE SENSITIVITY OF THE SAMPLE

In order to avoid a biased analysis due to the price sensitivity of the sample, it was asked in the survey at what price would the respondent consider the iPhone 4S *expensive*, *cheap* or *reasonable*, so that it was possible to trace the profile of the sample regarding this variable. The level of price sensitivity of the sample is rated according to the given answers and regarding the following parameters:

Table 2 – Level of Price Sensitivity

<i>Expensive</i>	<i>Level of price Sensitivity</i>	<i>Cheap</i>	<i>Level of price Sensitivity</i>	<i>Reasonable</i>	<i>Level of price Sensitivity</i>
200€	<i>Very High</i>	200€	<i>Low</i>	200€	<i>High</i>
450€	<i>High</i>	450€	<i>Medium</i>	450€	<i>Medium</i>
600€	<i>Medium</i>	600€	<i>High</i>	600€	<i>Low</i>
800€	<i>Low</i>	800€	<i>Very High</i>	800€	<i>Very Low</i>

Source: Author

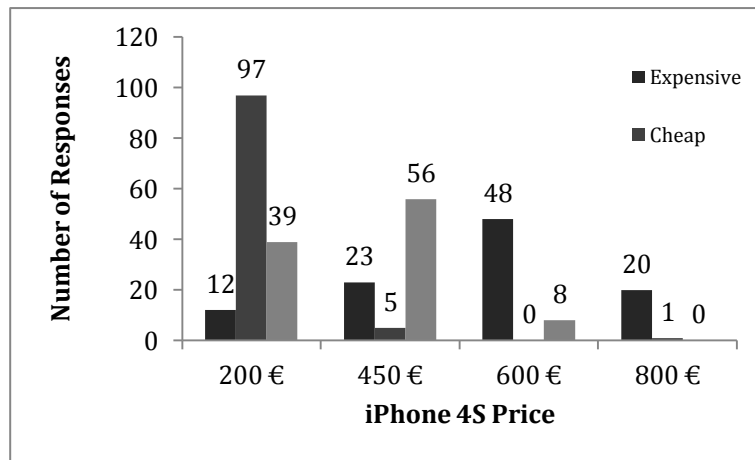
As seen in the Data Characterization section, 46 individuals (45%) consider the iPhone 4S to be expensive at a price of 600€, what according to the table above it is a *Medium* level of price sensitivity.

Moreover, 97 individuals (94%) consider the iPhone 4S to be cheap at a price of 200€ what means a *Low* level of price sensitivity.

Finally, 56 individuals (55%) consider the price of 450€ reasonable what means a *Medium* level of price sensitivity.

The Chart below shows the number of responses for each question:

Chart 2 – Price Sensitivity of the Sample



Source: Author

The iPhone 4S is available at the market with a price that varies between 600€ and 900€, depending on the version. As it is seen in Chart 4, most of the respondents consider it to be expensive at a price of 600€ and to be reasonable at a price of 450€.

This shows that in this sample there is a huge difference between the market price and the perceived value of it. These findings reflect that across this sample there are some budget constraints that lead to a higher price sensitivity.

From this section it is possible to make the second intermediary conclusion: **(2)** this sample reveals an overall *Medium* level of price sensitivity, which means that the enquired people reveal a stronger desire for obtaining a discount. This fact increases their willingness to accept the technological hypothesis of this study.

4.2.4 CT MODEL 1: INFORMATION VS. TIME SPENT

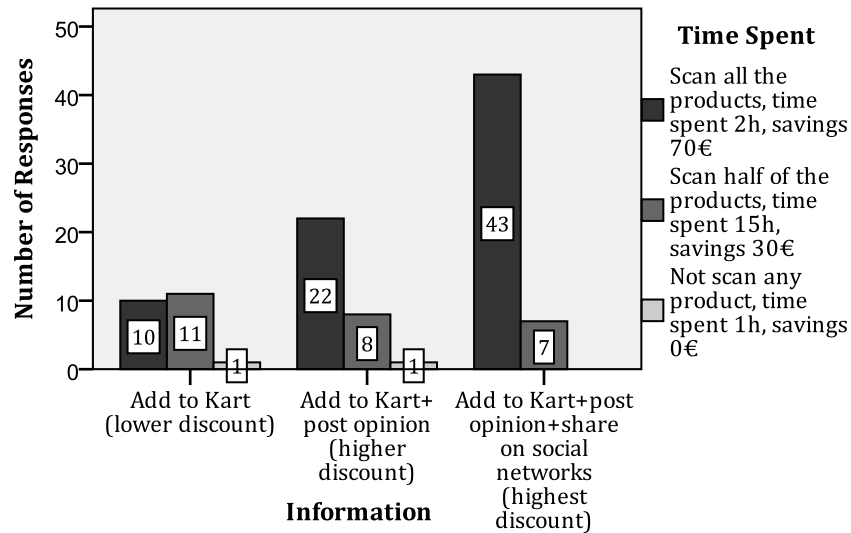
The control variables allow understanding better the relationships between the independent variables.

Therefore, after cross tabulating the motivational control variables *Information* and *Total Time Spent* the results showed that there is a correlation between them.

The chart below shows that most of the individuals enquired in the survey are willing to add layers of information to products and interact with the app to get the highest discount,

at the same time that they are willing to spend extra time in their shopping also to get the highest discount.

Chart 3 – Information vs. Total Time Spent



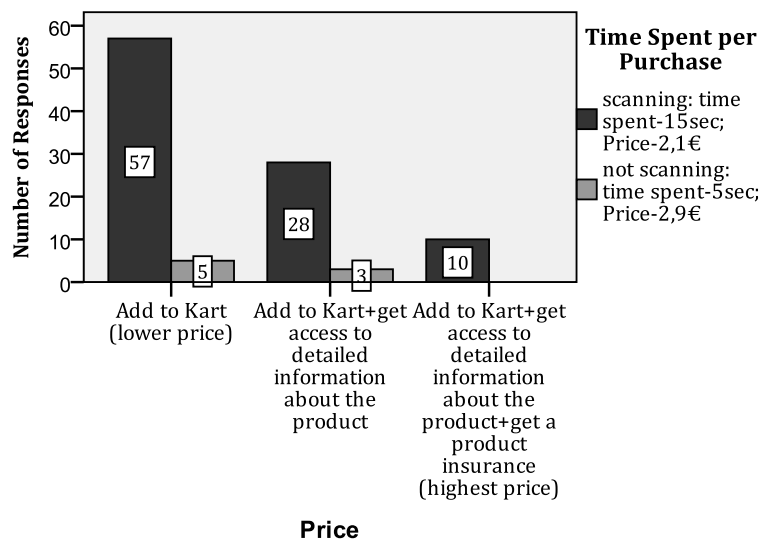
Source: Author

From this chart it is possible to make the third intermediary conclusion: **(3)** customers are willing to scan the products in-store to get a discount using their smartphones, even if it means spending extra time in their shopping. Moreover, customers are also willing to share information with the app in exchange for a discount.

4.2.5 CT MODEL 2: PRICE VS. TIME SPENT PER PURCHASE

The next chart shows that most of the individuals enquired in the survey prefer simple versions of the products in order to get the lowest price, at the same time that they are willing to shop through the proposed technological hypothesis in order to get the lowest price too, even if it means spending more time per shopping purchase.

Chart 4 – Price vs. Time Spent per Purchase



Source: Author

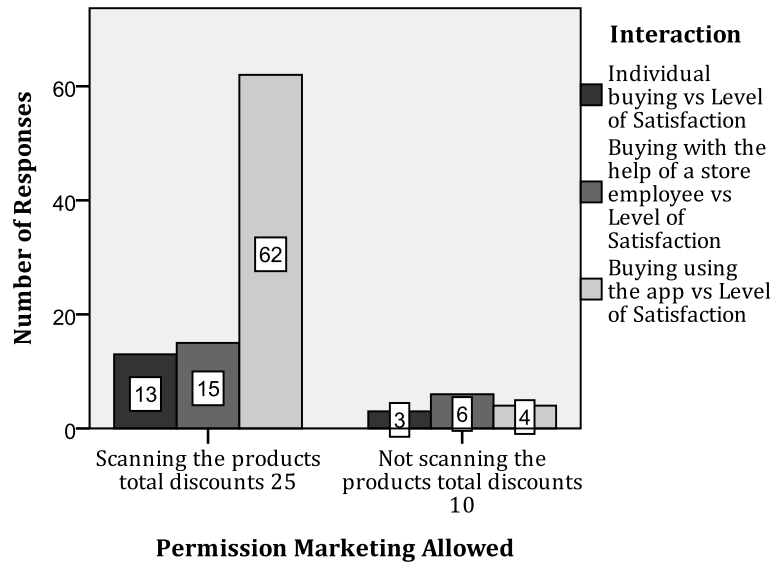
From this CT model chart, it is possible to make the fourth intermediary conclusion: **(4)** customers are willing to scan the products in-store to get the lowest price, even if it means shopping through their smartphones and spending extra time per shopping purchase. Moreover, customers are willing to add or remove product features in order to get the price that fits the most their wallets.

4.2.6 CT MODEL 3: PERMISSION MARKETING ALLOWED VS. INTERACTION

The next chart shows that most of the individuals enquired in the survey prefer personalized offers, at the same time that they are willing to shop through the proposed app, even if it means a decrease in satisfaction. However, it is also possible to see that the individuals value the introduction of a discount as an important driver for interaction.

Moreover, when cross tabulating the motivational control variables *Permission Marketing allowed* and *Interaction* the results showed that there is a correlation between them.

Chart 5 – Interaction vs. Permission Market allowed



Source: Author

From this chart, it is possible to make the fifth intermediary conclusion: **(5)** customers are willing to scan the products in-store to get a personalized offer using their smartphones, even if it means shopping through their smartphones and decreasing satisfaction. However, discounts provide a considerable leverage for people to have this reaction.

4.3 DISCUSSION OF THE RESULTS

This study aims to understand if customers are willing to engage in real-time, mobile and in-store price discrimination by using smartphones. In particular, it tests customers' price sensitivity and in what extent they are willing to go to get a discount through a product scanning process.

When analyzing the survey data it was found that this sample has a *Medium* level of price sensitivity what increases the desire to obtain a discount. It was possible to conclude that these people are willing to accept the technological hypothesis of this study, and that this intrinsic characteristic of their personalities can be a source of leverage for that acceptance. Regarding the less price sensitive customers it is not possible to make the same conclusion.

It was also found that 78,64% of the enquired individuals are available to post opinions about the products and share on social networks to get the highest discounts, at the same time that 90,29% of them prefer not to add too much extra features to products in order to

get the lowest price. These findings support Hypothesis 1 **“Adding or removing information to products influences buying decision and so it is possible to discriminate price in function of that”** and they are also confirmed by the CT Model 1. This fact validates one of the functionalities of the technological hypothesis presented in this study, confirming its potential.

Moreover, *Layers of Information* was considered as an independent variable in the analysis and after interpreting the results is seen that there is a relationship with the dependent variable *Discounts*, i.e., people add or remove information according to the amount of discount they want.

In the CT Model 1, it is also seen that the extra total time spent while shopping, due to scanning and adding information to products, is easily overcome with the introduction of better discounts. Customers are willing to scan systematically the products in-store to get a discount, but they are willing to go further and interact with the mobile channel to get better discounts. These findings support the Hypothesis 1 (referred above), Hypothesis 2a **“Customers can spend extra time in their shopping if they get a discount”** and the Hypothesis 2b **“Customers are willing to scan the products systematically in-stores with their smartphones if they get a discount”**. The verification of these two hypotheses allows verifying the Hypothesis 2 **“The perception of buying speed is intrinsically related to discounts”**.

Therefore, the *Perception of Buying Speed*, which was considered as an independent variable in the analysis, shows a relationship with the dependent variables *Discounts* and *scanning the barcode of products*, as people will decide the amount of time that they want to spend in their shopping scanning the products in function of the amount of the discount they want to get.

These findings validate another functionality of the technological hypothesis of this study, scanning products in-stores.

The CT Model 2 also supports the Hypothesis 2 as it confirms that customers do not mind to spend more time in buying each product if they get a better price. Moreover, it also supports Hypothesis 1 as it shows that adding or removing information on products influences buying decision.

The CT Model 3 reveals that customers are more willing to use the mobile channel instead of a physical channel in order to get a personalized offer or discount. Moreover, customers are even able to decrease their levels of satisfaction in terms of shopping experience, if it means that they will get a personalized offer and a higher discount. These findings support the Hypothesis 3 **“Customers prefer personalized marketing communications even if it is done via mobile, but discounts provide leverage to the usage of this channel”**.

The independent variable *Satisfaction* shows a relationship with the dependent variable *Discounts*.

The verification of the hypothesis 3 is very important in the context of this dissertation as it validates one of the functionalities of this technological hypothesis (personalized offers), but mainly because it shows that customers prefer to get a discount through a mobile device rather than a physical coupon.

Moreover, and considering that a 100% level of satisfaction happens when it is done via person-to person (store employee), the findings of this study show that customers are willing to decrease this level of satisfaction to get a personalized offer via mobile device.

This fact reinforces the potential of the technological hypothesis of this dissertation.

Regarding Hypothesis 4 **“Customers are not available to use the mobile channel if they feel it is not secure even if they get a discount”**, when analyzing the data it was found that 57,28% of the individuals would not buy a product if they felt their privacy and security issues were in risk, what supports this hypothesis.

The independent variable *Security* assumes a very relevant role in this technological hypothesis, as customers want to feel the mobile channel is safe in order to use it, and there is no discount that may lead them to “forget” that the platform they are using is not safe.

4.4 CONCLUSION OF THE CHAPTER

In this chapter, the results from the survey were interpreted and discussed regarding the research question.

The analysis of the results brought important insights to the discussion, which allowed crossing the acquired empirical knowledge with the hypotheses that were behind the research methodology of this study.

The next chapter presents the final conclusion of this research.

5 CONCLUSIONS

5.1 CONCLUSION

The main goal of this research was to answer the following research question: **Is the market prepared for real-time price discrimination by using smartphones?**

In order to answer this research question, the following hypotheses had to be verified:

H1. Adding or removing information to products influences buying decision and so it is possible to discriminate prices in function of that.

H2. The perception of buying speed is intrinsically related to discounts.

H2a. Customers can spend extra time in their shopping if they get a discount.

H2b. Customers are willing to scan the products systematically in-stores with their smartphones if they get a discount.

H3. Customers prefer personalized marketing communications even if it is done via mobile, but discounts provide leverage to the usage of this channel.

H4. Customers are not available to use the mobile channel if they feel it is not secure, even if they get a discount.

The intermediary conclusions made in the previous chapter, allow having an overall perspective regarding these hypotheses:

(1) The effect, which the dependent variables *Discounts* and *Scanning*, measured by the motivational control variables, have on the independent variables, shows a positive representativeness of 67,48%, what indicates a considerable positive acceptance of the technological hypothesis of this study.

(2) The collected sample reveals an overall *Medium* level of price sensitivity what means that the enquired people reveal a stronger desire for obtaining a discount. This fact increases their willingness to accept the technological hypothesis of this study.

(3) Customers are willing to scan the products in-store to get a discount using their smartphones, even if it means spending extra time in their shopping. Moreover, customers are also willing to share information with the app in exchange for a discount.

(4) Customers are willing to scan the products in-store to get the lowest price, even if it means shopping through their smartphones and spending extra time per shopping purchase. Moreover, customers are willing to add or remove product features in order to get the price that fits the most their wallets.

(5) Customers are willing to scan the products in-store to get a personalized offer using their smartphones, even if it means shopping through their smartphones and decreasing satisfaction. However, discounts provide a considerable leverage for people to have this reaction.

Taking into consideration the intermediary conclusions, it is clear that customers are willing to use the mobile channel via a product scanning process; at the same time, they are willing to interact with this channel, by sharing, adding and removing information, in order to get personalized offers and discounts, what confirms the hypotheses 1 and 3.

Moreover, it is also clear that the Perception of Buying Speed is intrinsically related to discounts and because of that, customers do not mind to spend extra time in their shopping to get a discount. This finding confirms the hypothesis 2.

Furthermore, the results also showed that customers are not willing to adopt the mobile channel if they feel it is not secure, even if they get a discount. This confirms the hypothesis 4.

As all the hypotheses have been confirmed, the answer to the research question is the following:

The market is ready to engage in real-time price discrimination by using smartphones, as there is available technology to do it, and customers are willing to scan systematically products in-stores to get better offers and better discounts.

5.2 LIMITATIONS OF THE STUDY

The main limitation of this study lies on the fact that the observed sample reveals a *Medium* level of price sensitivity, and because of that the answer to the research question is based on a set of some price sensitive customers.

Regarding the less price sensitive customers, this study is inconclusive and it is not possible to affirm that these that they are willing to engage in real-time price discrimination, as their desire to obtain a discount is lower than the more price sensitive customers.

5.3 FUTURE RESEARCH

Future research might explore the introduction of a new functionality in this technological hypothesis such as Mobile Payments.

Some developments have been occurring in this area, mainly due to the introduction of Near Field Communications (NFC) in mobile devices.

Therefore, allying the technological hypothesis presented in this study with an internal mobile payment system can be very interesting.

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7.1 APPENDIX I – ANALYSIS OF RESEARCH METHOD AND RESPONDENTS PROFILING

Table 3 – Research Method

Research Method		Total
Nº of Surveys Viewed		150
Nº of Surveys Started		135
% of Survey Started		90%
Nº of Surveys Completed		103
% of Survey Completed		76,30%

Table 4 – Socioeconomic and Demographic Traits

Profiling of Respondents – Socioeconomic and Demographic							
	N	Min	Max	Mean	Std. Dev.	95% Confidence Level	
Gender	103	1	2	1,46	0,501	1,37	1,56
Age	103	2	7	3,27	1,083	3,07	3,48
Geographic Residence	103	1	4	2,13	0,416	2,05	2,21
Perceived Income	103	1	5	2,56	0,782	2,41	2,71

Table 5 – Mobile Traits

Profiling of Respondents – Mobile Traits							
	N	Min	Max	Mean	Std. Dev.	95% Confidence Level	
Smartphone Owner	103	1	2	1,47	0,501	1,37	1,56
Potential Smartphone Buyer	48	1	2	1,6	0,494	1,46	1,75
Frequency of apps download	101	1	5	2,88	1,107	2,66	3,10
Frequency of apps use	101	1	5	3,16	1,138	2,93	3,38

Survey Questions

Variable: Price Sensitivity; Variable Coding: Ps_

Ps_Q8. At what price would you consider the iPhone 4S to be so expensive that you would not consider buying it? (Too expensive)

1. 200€
2. 450€
3. 600€
4. 800€

Ps_Q9. At what price would you consider the iPhone 4S to be priced so low that you would feel the quality couldn't be very good? (Too cheap)

1. 200€
2. 450€
3. 600€
4. 800€

Ps_Q10. At what price would you consider the iPhone 4S starting to get expensive, so that it is not out of the question, but you would have to give some thought to buying it? (Expensive/High Side)

1. 200€
2. 450€
3. 600€
4. 800€

Variable: Information; Variable Coding: Inf_

Inf_Q12. You are buying a certain product. After scanning the barcode you get a discount and you have different options. What would you do?

1. Add to Kart (lower discount)
2. Add to Kart + post your opinion about the product (higher discount)
3. Add to Kart + post your opinion about the product + share on social networks (highest discount)

Variable: Price; Variable Coding: Pr_

Pr_Q13. You are buying a certain product. After scanning the barcode you have different options with logical implications on price. What would you do?

1. Add to Kart (lower price)
2. Add to Kart + get access to detailed information about the product (Higher price)
3. Add to Kart + get access to detailed information about the product + add a product insurance (Highest price)

Variable: Buying Speed Perception per purchase; Variable Coding: BSPPP_

BSPPP_Q14. You are buying a certain product. Choose one option:

1. scanning the product; time spent 15 seconds; Price: 2,1€
2. not scanning the product; time spent: 5 seconds; Price: 2,9€

Variable: Overall Buying Speed Perception; Variable Coding: OBSP_

OBSP_Q15. You finish your shopping. Choose one option:

1. You scanned all the products; time spent: 2 hours; savings: 70€
2. You scanned half of the products; time spent: 1,5 hours; savings: 30€
3. You did not scan any product; time spent: 1 hour; savings: 0€

Variable: Permission Marketing allowed; Variable Coding: PerMa_

Per_Q16. The company knows your shopping habits and you allow them to use it. Choose one option:

1. Scanning the products; total discounts: 25€.
2. Not scanning the products; total discounts: 10€.

Variable: Permission Marketing not allowed; Variable Coding: PerMna_

NPer_Q17. The company knows your shopping habits but you do not allow them to use it. Choose one option:

1. Scanning the products; total discounts: 10€
2. Not scanning the products; total discounts: 0€

Variable: Interaction; Variable Coding: Int_

Int_Q18. You are buying a certain product. Choose one option:

1. You buy everything on your own. Overall Satisfaction: 50%. Discounts: 20€
2. You buy with the help of a store employee. Overall Satisfaction: 100%. Discounts: 20€
3. You buy using the presented app. Overall Satisfaction: 75%. Discounts: 50€

Variable: Privacy and Security; Variable Coding: PaS_

PaS_Q19. You get a discount in a product using this app, but you feel that there is a lack in security and privacy issues when using this app. Choose one option:

1. Buy the product with discount.
2. Not buy the product even with the discount

7.3 APPENDIX III - DESCRIPTIVE STATISTICS OF VARIABLES CONSIDERED IN THE ANALYSIS

Table 6 - Descriptive Statistics

Descriptive Statistics							
Variable	N	Min	Max	Mean	Std. Dev.	95% Confidence Level	
Question Coding							
PS_							
Ps_Q8	103	1	4	2,67	0,943	2,49	2,85
Ps_Q9	103	1	4	1,08	0,362	1,01	1,15
Ps_Q10	103	1	3	1,7	0,608	1,58	1,82
Inf_							
Inf_Q12	103	1	3	2,27	0,795	2,12	2,43
Pr_							
Pr_Q13	103	1	3	1,5	0,67	1,36	1,63
BSPPP_							
BSPPP_Q14	103	1	2	1,08	0,269	1,03	1,13
OBSP_							
OBSP_Q15	103	1	3	1,29	0,498	1,19	1,39
PerMa_							
Per_Q16	103	1	2	1,13	0,334	1,06	1,19
PerMna_							
NPer_Q17	103	1	2	1,24	0,431	1,16	1,33
Int_							
Int_Q18	103	1	3	2,49	0,752	2,34	2,63
PaS_							
PaS_Q19	103	1	2	1,57	0,497	1,48	1,67

7.4 APPENDIX IV – REPRESENTATIVENESS OF THE INDEPENDENT VARIABLES

Table 7 – Representativeness of the Independent Variables

Representativeness of the Independent Variables					
Independent Variable	Variable	Answer 1	Answer 2	Answer 3	
Variable	Coding				
		Nº of Individuals	Nº of Individuals	Nº of Individuals	Total
Layers of information	Inf_Q12	22	31	50	103
	Pr_Q13	10	31	62	103
TOTAL		32	62	112	206
Perception of Buying Speed	BSPPP_Q14	95	8	-	103
	OBSP_Q15	75	26	2	103
TOTAL		170	34	2	206
Satisfaction	Per_Q16	90	13	-	103
	NPer_Q17	78	25	-	103
	Int_Q18	66	21	16	103
TOTAL		234	59	16	309
Security	PaS_Q19	44	59	-	103
TOTAL		44	59	-	103

Table 8 – Representativeness of the Independent Variables in %

Representativeness of the Independent Variables in %				
	Answer 1	Answer 2	Answer 3	Total
Layers of Information	15,53%	30,10%	54,37%	100%
Perception of Buying Speed	82,52%	16,50%	0,97%	100%
Satisfaction	75,73%	19,09%	5,18%	100%
Security	42,72%	57,28%	-	100%

Note: From the different answer options of the survey, the values in bold are the ones which are considered more positive and interest the most to this study.