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Smartification of Retail Environment

The case of AB Vassilopoulos

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I hereby declare that the work submitted is mine and that where I have made use of another's work, I have attributed the source(s) according to the Regulations set in the Student's Handbook.

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Abstract

The dissertation concentrates on creating a retail environmental smartification model for AB Vassilopoulos supermarkets. In order to achieve this objective the project emphasizes on investigating and exploring the current state of AB Vassilopoulos stores, the way that retail environmental smartification could change the overall consumption experience and the potential challenges and opportunities of AB Vassilopoulos stores smartification. Additionally, an investigation towards consumers' preferences regarding AB Vassilopoulos stores smartification is further developed. In order to fulfill its purpose the study follows a phenomenological approach using a mixed method strategy in order to capture all the elements of AB Vassilopoulos stores environmental smartification through a combination between qualitative and quantitative research. In the context of the research strategy, from the qualitative research perspective, the study utilizes the single-case study design via which the literature review findings are supported by conducting semi-structure interviews with AB Vassilopoulos Business Intelligence & Strategy Director and customers. From the quantitative perspective the study utilizes designed questionnaires as a tool in order to address the present study's research objectives which are formulated in examining questions. Smartifying AB Vassilopoulos supermarkets could create a more pleasant and interactive shopping environment allowing easier and faster shopping, in a more comfortable and effective way. This fact along with increasing customers' satisfaction by allowing them to give direct feedback about the store's service and environment and creating a superior shopping experience based on their preferences are considered the main existing opportunities of AB Vassilopoulos supermarkets smartification for the customers. There are also benefits for the company including the creation of an upper- level customer-store relationship that would facilitate acquiring more loyal customers and retrieving valuable knowledge about their preferences and the implementation of more effective promotional strategies. The existing challenges of AB Vassilopoulos supermarkets environmental smartification are related with customers' security and privacy concerns, difficulty in adjusting to the new smart retail environment and potential lack of human interaction. Eventually, all these finding along with the ones referring to consumers' preferences and perceptions towards retail environmental smartification were combined for the creation of a retail environmental smartification model for AB Vassilopoulos supermarkets.

Key words: retail environmental smartification, IoT applications, multi-sensory UX, AB Vassilopoulos, smart retail applications, consumption experience

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Bortziou Marianthi

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Table of Contents

Table of Tables

Table of Figures

List of abbreviations

IoT	Internet of Things
UX	User Experience
CRM	Customer Relationship Management
RFID	Radio Frequency IDentification
WSN	Wireless Sensor Networks
POS	Point of Sale

Introduction

In a constantly "opening" world that is defined by socioeconomic changes, the globalization of the market, and the availability of new technologies has laid the ground work for the Third Industrial Revolution, allowing the creation of an Internet of Things (IoT) infrastructure. As stressed by Jeremy Rifkin (2008) the undergoing Third Industrial Revolution refers to issues such as digital communication interface, energy efficiency, and smart transport under the umbrella of IoT ecosystems.

A similar study (Smith, 2014), reports that in this new era of continuous alterations Internet of Things technologies will be installed into every device, allowing them to communicate with each other, while it is estimated that by 2020 there will be more than 38 million sensors connecting everything and everyone via the Internet of Things in a global distributed intelligent network. This environment provides an opportunity for IoT applications to explode almost all industries as can be seen in Figure 1.

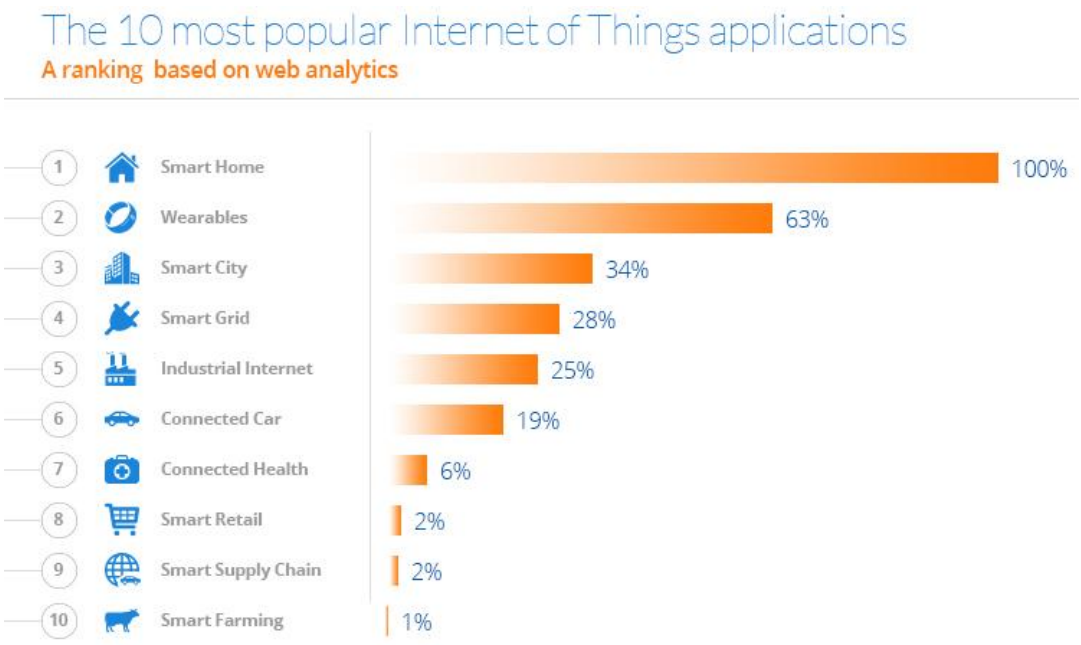

Figure 1. The ten most popular IoT application areas (Source: Lueth, 2015)

As the Internet of Things is entering more and more the mainstream consumer market, retail stores need to explore a broad range of options regarding their customer shopping experience approach.

Recent research findings (Lee et al., 2015) indicated that the smartification of a store, defined as "the entrance of smart devices, such as wearable technologies, or monitoring sensors into a store environment", can improve customer services and convenience, work efficiency and profitability, using IoT technologies. Furthermore, a report (Mazhelis et al., 2013) regarding applying IoT value systems in store environments argues that the emerging market makers, while creating, delivering and capturing value, should follow the simple rules strategy, build the IoT awareness and customer loyalty through introducing the basic IoT solutions first, and then gradually offer more advanced IoT solutions and systems, combined with multisensory branding techniques. The smartification of a store could be combined with applying multisensory branding techniques involving consumers' all five senses, in order to create an engaging, high-quality shopping experience. Until today only a few brands have recognized the hidden value that can be created by applying IoT and multi-sensory UX strategies in order to smartify their store environment.

The present dissertation study aims at providing novel insights concerning the retail environmental smartification of AB Vassilopoulos Greek supermarket chain stores using IoT and multi-sensory UX applications. In order to achieve this objective, the study initially emphasizes on the exploration of the current state of AB Vassilopoulos stores, the way that retail environmental smartification could change the overall shopping experience and the challenges and opportunities regarding the human interaction with IoT and multi-sensory UX applications. Additionally, an investigation towards the consumers' preferences and perceptions regarding AB Vassilopoulos stores environmental smartification is further developed. The analysis of the findings aims at the creation of a retail environmental smartification model for AB Vassilopoulos supermarkets that could facilitate the generation of a unique and consistent retail experience.

Spanning five chapters this study begins by conducting a detailed discussion of international literature surrounding the underlying environmental smartification IoT and multi-sensory UX technologies and applications and the challenges and opportunities regarding the human interaction with them. In the second chapter a detailed review of each and every methodological aspect of the study is presented. More concretely, this chapter engulfs the presentation of the research purpose, approach, methodological choice, and research strategy. Subsequently, it provides the necessary information related to data collection and data analysis and the sampling followed procedure, from a methodological perspective. The third chapter entails the results derived from the data analysis. The fourth chapter refers to the discussion of the derived findings. Eventually, the last chapter summarizes the conclusions and major points of the current dissertation study. Subsequently, the chapter presents the limitations of the overall study, while based on these limitations and challenges suggestions towards future research has been generated in order to enrich the current study and the current retail smartification literature.

Chapter 1- Literature Review

1.1 AB Vassilopoulos

This section refers to AB Vassilopoulos company history, vision, dynamic expansion, and development since its foundation in 1969 by the two brothers Gerasimos and Charalabos Vassilopoulos. Based on the available data found in the company's official webpage (AB Vassilopoulos, n.d.), the company owns over 310 stores all over Greece designed to address its customers basic daily needs fast and easily. Recent evidence (Tzivakou and Sabour, 2014), indicate that the company employs 10.599 people; therefore it is considered one of the most important employers in Greece.

An article regarding the company's vision (Sideri, 2014), reports that AB Vassilopoulos is a premium quality supermarket chain aiming at integrity, effectiveness, creativity, flexibility, quality and respect. AB Vassilopoulos, offers its customers a variety of nutritious, healthy, safe, affordable, and sustainable products, while focusing on the promotion of Greek traditional products by launching its own private label product line.

Interestingly enough, AB Vassilopoulos has implemented innovative technologies and practices that have helped the company to maintain its high position in the retail market and in the conscience of consumers as one of the biggest and most credible companies in Greece. A study examining both the organization and the administration of AB Vassilopoulos company (Tzivakou and Sabour, 2014), suggests that the AB Vassilopoulos supermarket chain was the first to introduce barcode cash registers in Greece in 1994 that provided its stores with faster customer service and more effective inventory management. In 1995 the company opened a freeflow store in Athens, which allowed product self- scanning for the first time in Greece. Furthermore, in 2005 the company started a smart retailing pilot program including adopting assisted self-service systems in the self-traiteur (ready meals for busy customers) department and redesigning bake-offs in order to provide the stores with appealing freshly baked bread odor and create a warm atmosphere. Last but not least, as reported by AB Vassilopoulos corporate responsibility report for 2010 (AB Vasilipoulos, 2011), in 2010 company entered a new era as regards store construction, by launching AB Green Store, which was directed towards implementing energy-saving techniques that can produce and save energy at a rate of up to 40% compared to conventional stores.

Based on the aforementioned insights regarding AB Vassilopoulos supermarket chain, one could easily observe that the company is focusing on launching innovative systems and techniques and embedding new technologies in order to create unique store environments and remain faithful to its vision. Having said that, it can be concluded that the smartification of the AB Vassilopoulos supermarkets' environment by implementing multisensory UX techniques and embedding IoT technologies, could facilitate the company to enter a new era of development, maintaining its position between the top Greek enterprises.

1.2 Store environment background analysis

Today's constantly changing retail trends such as customers increasing interest in the shopping experience and emerging multi-channel retailing strategies, have changed the nature of retailing and competition over the years, while creating discrete waves of innovation and advance. Based on past literature findings (Huchzermeier and Iyer, 2006) the first wave that started at the beginning of the '80s, was the wide diffusion of UPC barcode scanning. The second wave that began ten years later was customer relationship management (CRM) based on retailer introduction of customer loyalty cards. Similar research findings (Dawson, 2001) report that the undergoing third wave, called customer experience management, is characterized by a re-structuring of retailing with new roles and functions becoming evident. The convergence of information and communication technologies, the application of multisensory UX techniques, and technological breakthroughs, such as radio frequency identification (RFID), are having a dramatic impact on the way retailers do business.

Successful retailers are developing strategies that offer customers greater value over competitors, both in terms of better and faster service and in terms of providing them with higher levels of intimacy, satisfaction, and interaction. It has been stressed (Huchzermeier and Iyer, 2006) that consumers' perceptions of value and their subsequent patronage are heavily influenced by their perceptions of the store's "look and feel." Literature (Baker et al., 2002; Spangenberg et al., 1996; Hui and Bateson, 1991) suggests that music, color, scent, and crowding can also significantly impact the overall shopping experience.

The purpose of a store design is not merely to create just a pleasant environment. Kotler (1974) defines store atmospherics as “an effort to design buying environments to produce specific emotional effects in the customer that enhance his purchase probability” Along similar lines (Kizer and Bender, 2007) in- store design aims at the creation of an appealing environment for the customers that encourages them to spend time in the store and to purchase impulsively while they are there.

Based on the aforementioned provided insights, in-store technologies are being deployed not just to facilitate shopping, but to also add elements of entertainment and engagement in the physical store environment. Retailers' store smartification, based on interaction with various technologies has grown over the last few decades. For example, recent research evidence (Meijers, 2014) indicate that Whole Foods launched a new “Store of the Future” in October 2014, and it’s chock-full of immersive digital experiences that show shoppers where their food comes from. Additionally, it has gigantic digital screens that displaying an Instagram feed of locally grown produce and farmers and a digital mirror that lets shoppers strike poses and recommends health products.

Interestingly enough, an executive summary published by Food Marketing Institute (2012) reports that technology is changing the way consumers shop. Overall, 52% of consumers use technology during their shopping. Shoppers use their mobile technology to track their lists (16%), and check recipes (13%). Nearly one in 10 customers checks coupons (9%), tracks their spending (9%), researches products (9%) or checks prices (8%) while shopping. Still others look for nutritional information (7%), scan shelf labels (7%), or use technology to locate products within the store (5%).

The present study aims not only at investigating recent trends and share industry and academic insights, but also looks ahead into the near future of retailing and explores all the possible IoT and multisensory UX applications that could be embedded in a AB Vassilopoulos supermarket environment.

1.3 The multi-sensory in-store experience

Based on the above discussion on in- store design and the strategies and technologies implemented over the years, more light should be shed on turning the in-store human interaction into a unique element of his consumption experience.

As stressed by Bäckström and Johansson (2006) the contemporary customers are referred to as experience-seeking, meaning that they have a need for entertainment, emotions and interaction. On this basis, Rodrigues et al. (2011) suggest that both cognitive and emotional needs only can be addressed by building a store's personality based on multi-sensory strategies that provide customers with a superior experience. When it comes to retailing, past research evidence (Floor, 2006) suggest that in order for the stores to become their own brands, while remaining competitive, it is of great importance to create an emotional connection and build a positive image of the brand in the customers mind, by providing them with a high level of interaction within the store environment.

It has been reported (Smith and Burns, 1996) that store environment concerns environmental cues that can have a potential effect on humans' behaviour as well their perception. More specifically, based on past research evidence (Lam, 2001), store environment is made up of physical and relational characteristics and elements with which the customer interacts in the setting, including music, sounds, textures, smells, lighting, layout, directional signage etc.

The definition of a multi-sensory –experience, as reported by Hulten (2011), emphasizes on "perceiving more than one of human senses during a consumption experience" (Figure 2). It is further stated (Jablanović et al., 2015) that sensorial strategies for smell, sound, sight, taste, and touch can leave such imprints of a multi-sensory experience, so that a brand of a store becomes more individual and personal to the customer.

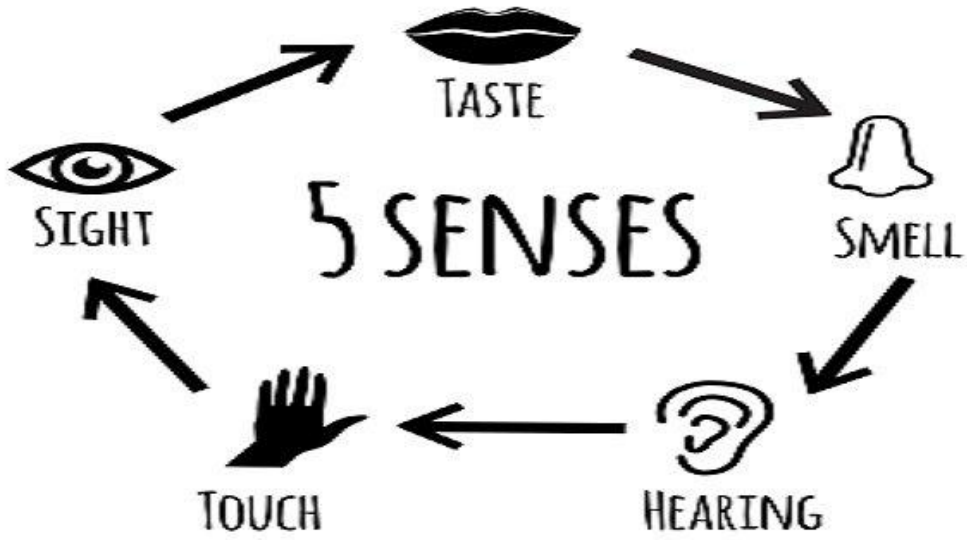

Figure 2. The multisensory UX model (Source: Starr, 2015)

Recently, interesting conclusions was emerged by the literature in the context of the effectiveness of multisensory UX techniques. An article published by The Guardian on multisensory retail (Carter, 2014), reports that in 1982, Milman observed that slow music increased spend in supermarkets by 39.2%. Additionally, Nike has found introducing scent into their stores increased intention to purchase by 80%.

Similar studies, concentrate on the benefits of allowing their customers to touch and interact with products. As suggested by a study investigating tactile sensation (Williams and Ackerman, 2011), physically holding products can create a sense of psychological ownership, driving must-have purchase decisions. As stressed by Underhill (2009) “we are buying more products than ever before based touch and trial”. Provided that, many retail stores and especially electronics outlets such as the Apple Store and Best Buy, have moved inventory from display cases into customers’ hands.

Living in a society that is characterized by the third wave, where globalization, variety and pluralism are important features in combination with emotions and experiences (Hultén et al., 2008) it is becoming highly important to better understand the less researched area of a multisensory experience. Therefore, smart stores have to set up an appropriate physical environment in order to create superior multi- sensory experiences. As stressed by Manyika et al. (2013) technological solutions are used trying to enhance the customers’ experiences, by transforming the store’s physical objects and surfaces into an interactive, activity-aware environment by leveraging sensors and actuators.

Based on the evidence presented above, it can be concluded that IoT could become the next element facilitating the multisensory UX techniques to reach a new level of interaction. Despite that fact, there is still a gap on the existing international literature regarding the application of IoT technologies in order to achieve this goal.

1.4 Business drivers of IoT and its applications

The objective of this section is to analyze the meaning of IoT and present the existing business drivers regarding IoT applications, in order to give retailers a reason to believe in the effectiveness of retail environmental smartification methods and their benefits.

Generally, a number of definitions have been provided for the term Internet-of-Things in recent literature. Rifkin (2014) has stressed that the Internet of Things refers to the emerging trend of augmenting physical objects and devices with sensing, computing, and communication capabilities, connecting them to form a network and making use of the collective effect of the networked objects. A major international project which goes by the name CASAGRAS on collaboration among the European Union, Korea, Japan, China and the United States for defining standards regarding IoT (2009), reported that the Internet of Things can be considered as a global network infrastructure, linking physical and virtual objects through the exploitation of data capture and communication capabilities. This infrastructure can offer specific object-identification, sensor and connection capability as the basis for the development of independent cooperative services and applications.

In terms of business, it has been reported (Burkitt, 2014), that IoT represents a tremendous opportunity for three broad strategic categories, each reflecting a different type of enterprise, which are “Enablers” that develop and implement the underlying technology, “Enbeders” that design, create, integrate, and deliver IoT services to customers and “Enhancers” that devise their own value-added services, on top of the services provided by Engagers, that are unique to the Internet of Things. By creating new business models or renewing traditional business models, many companies like Dell, IBM, IKEA, Haier, Galanz, have achieved great success in the last decade.

Harvard Business School Press (2010) suggests that other benefits of applying IoT innovations in a company business environment include cost reduction, strategic flexibility, exploitation of new market opportunities, and reduced risk of capital investment. In a more recent study, Osterwalder and Pigneur (2013) presented a similar approach by reporting that there are many other advantages for companies to apply IoT strategies in their business environment. Applying IoT strategies and developing easy-to-use-and-adopt services and providing smart solutions in their stores, companies could address the end-user's needs and desires. Last but not least, another study regarding smartification using IoT strategies (Kyriazisa and Varvarigoua, 2013) indicates that the dynamic rapidly changing and technology-rich digital environment puts emphasis upon approaches that allow things to become smarter, more reliable, and more autonomous and enables the provision of added-value applications that exploit a multitude of devices contributing services and information. Such applications will be presented and analyzed in the following section.

1.5 IoT applications

Based on the previously analyzed literature evidence in relation to the provided benefits of IoT applications this section aims at presenting the typical applications of IoT and mainly those that can be implemented for the smartification of a store environment.

Data from several sources (Gluhak et al., 2011; Xu et al., 2011) have identified IoT environment smartification as the major IoT application area that is already drawing attention. When it comes to personal and home applications it has been reported (Miorandi et al., 2012) that sensors are used in personal spaces creating a monitoring system that can collect information regarding the body state of the people being in the room, meaning the temperature, their pulses etc. Such applications can be used to control equipment like air conditioners leading to a better energy management system and creating a pleasant environment.

When it comes to retail, Mazhelis et al. (2013) provide a deeper insight on environmental smartification by describing a smart store environment, where customers may use electronic shopping assistants. By pointing on a particular product, key information about this product is listed: price, production/expiration date, ingredients and origin of subcomponents, calories, origin, “green” information, the cheapest price of the same product in surrounding super markets, public health warnings regarding the product, alternatives for the product in the same store, and the country of origin. On this basis, Chui et al. (2010) suggest that IoT applications can be used in a store environment to sensor customers’ preferences in real time and afterwards dynamic pricing could be used in order to increase the odds of a purchase. Companies that take advantage of such capabilities stand to gain against competitors that don’t. Customer needs addressed in this business model would be transparency, fast, reliable and independent information, and customized warnings (for diabetes, lactose intolerance etc.).

On July 2015, Target Company has opened the Target Open House store in San Francisco. Recent evidence (Stinson, 2015) reported that Open House is filled with sensor-laden products; it detects your presence almost immediately and serves up gee-whiz interactions without prompting. Moreover, as customers pass gadgets, conversation bubbles pop up on the wall, lending the devices a friendly, cartoonish character. In addition, two multi-touch tables let you learn about each product and visualize how they work together in a single ecosystem. Additionally, as stressed by Target’s director, David Newman (Higginbotham, 2015), Open House is a retail space, but also a test lab where consumers will learn about products and Target will learn about its consumers.

Based on the aforementioned arguments, it becomes obvious that the model of a smart store, such as the Open House that encapsulates the IoT interaction environment can be considered as the basis of the next generation retail stores. While there is a great amount of research regarding environmental smartification based on IoT, far too little attention has been paid to the usage of IoT strategies specifically for the smartification of a store and especially in combination with the application of multisensory UX techniques. However, The IoT has already expanded in a lot of areas and further research within this field would definitely lead to the creation of value for the future companies.

1.6 Role of underlying technologies

While the IoT vision requires substantial advances in several fields, its realization follows an incremental process, starting from existing technologies and applications. In particular, it has been stressed (Miorandi et al., 2012), that IoT began to expand starting from identification technologies such as RFID, which are already widely used in a number of applications. The same study (Miorandi et al., 2012) reports that as IoT began to develop it started to build on approaches introduced in a variety of relevant fields, such as wireless sensor networks.

Various IoT technologies can be conventionally categorized into tagging, sensing and embedded things. Mazhelis et al. (2013) suggest that the tagging things provide seamless and cost-efficient item identification, allowing the things to be connected with their records in databases. The sensing things enable us to measure and detect changes in the physical status of our environment. Finally, the embedded things yield information about the internal status of the embedding object. This section aims at providing insights regarding the role of the technologies that are used for the IoT applications, and that can be later combined with multisensory UX strategies in order to create a retail environmental smartification model. Past studies regarding IoT technologies (Roussos and Kostakos, 2009; Michahelles et al., 2007) have identified types of technologies that are used to support the IoT applications, which include wireless sensor networking technologies and RFID.

Radio frequency identification technology is reported (Gubbia et al., 2013) to be a major breakthrough in the embedded communication paradigm. Similar studies (Miorandi et al., 2012), have reported that RFID devices can nowadays be considered a mainstream communication technology. As indicated by past literature findings (Welbourne et al., 2009, Juels, 2006) RFID plays a key role as enabling identification technology in IoT, since such devices help in the automatic identification and tracking of anything they are attached to acting as an electronic barcode. The passive RFID tags use the power of the reader's interrogation signal to communicate the ID to the RFID reader. This has resulted in many retail applications. Active RFID readers have their own battery supply and can instantiate the communication.

As far as wireless sensor nodes and networks are concerned it has been stressed (Miorandi et al., 2012) that the ability of sensing the environment represent important features from an IoT perspective. Literature evidence regarding Wireless Sensor Networks (WSN) (Jayavardhana et al., 2015) reports that sensor nodes need to communicate among themselves to transmit data to a distributed or centralized system for analytics, while the overall network has the ability to interact with the outside world through the Internet.

Based on recent studies (Jayavardhana et al., 2015) visualization is also considered a critical element of IoT applications as it allows the interaction of the user with the environment. With recent advances in touch screen technologies the use of smart tablets and phones has become very intuitive, along with similar tools such as digital mirrors providing entertaining, interactive and easy to understand visualization.

The usage of such complex tools could be proven really challenging when it comes to human interaction with IoT systems and especially in environments, such as supermarkets, where people visiting can come from different backgrounds and differ in terms of education, age, familiarization with technology etc. The next section presents both challenges and opportunities that could appear during the human interaction with smart systems using IoT technologies, based on the existing international literature.

1.7 Challenges and Opportunities regarding human interaction with IoT

This section aims at providing novel insights concerning the existing challenges and opportunities within the human interaction with IoT systems. In a more recent study (Jayavardhana et al., 2015) the IoT vision is presented as a flexible and open architecture that is user centric and enables different players to interact in a manner suitable for their own requirements, rather than the IoT being thrust upon them. Additionally, the same study (Jayavardhana et al., 2015) suggests, that the IoT systems will become more and more responsive in nature, being able to anticipate user needs according to the situation they are in.

Evidence regarding IoT system's interaction levels (Guo et al., 2013) indicates that there is a bidirectional relationship between human and IoT systems, meaning that IoT becomes the primary media to sense and monitor human behaviours while the system's performance is also affected by human behaviours. In order to further understand the nature of the human- IoT interaction, recent studies (Guo et al., 2013) have analysed the three sensing capabilities of IoT which are user awareness, ambient awareness and social awareness. To begin with, user awareness refers to the ability to understand personal behavioural patterns, in a smart store this could include customer activity, preferences etc. Ambient awareness concerns status information on a particular space, e.g. the number of customers, the density of the lights etc. Social awareness goes beyond personal contexts and extends to group and community levels. The objective is to reveal the patterns of social interaction, such as the word of mouth between customers, including social media.

Past literature findings (Motani et al., 2005) have reported that data sharing is the major application area of IoT, which exploits humans' mobility and their gregarious nature to transmit information. Provided that, smart stores could become source nodes and send promotional messages to their destination nodes that could be existing or potential customers, using their IoT system. Studies on social networks (Tang et al., 2012) have also reported that by studying the social network of a customer and storing information in IoT systems a smart store could retrieve valuable knowledge about its customers' needs and their desired type of interaction. The combination of these two applications of IoT technologies could lead to an effective promotional strategy.

Data from recent studies (Jayavardhana et al., 2015) report that IoT systems can provide smart stores with simple and direct customer feedback, using devices such as smartphones or tablets connected with the store's IoT network. Based on the same study (Jayavardhana et al., 2015) the customer can also be provided with feedback regarding an item's function and properties using the same devices and direct messages, which increases the accuracy of the processes and may improve their attractiveness/appeal. Furthermore, monitoring consumers' behavior and their past preferences and actions stored in the IoT system could lead to a change of the consumer's behavior towards the store's desired outcome (e.g. selling a specific product).

Smartification, however, comes with a price. Jaramillo and Srikant (2007) reported that sharing data in IoT applications can raise significant security concerns. The new security challenge introduced here is the protection of the privacy of participants while allowing their devices to reliably share/forward data in IoT systems. Many people will resist interacting with IoT systems as long as there is no public confidence that it will not cause serious threats to privacy. Along similar lines (Atzori et al., 2010) IoT is extremely vulnerable to attacks, since its components spend most of the time unattended and most of the communications are wireless. Taking all these into consideration, information providers must be able to implement access control on the data provided.

Additionally, the ways in which data collection will be accomplished in the IoT are completely different from those that we now know and there will be great number of occasions for personal data to be collected. Therefore, it will be impossible for human individuals to personally control the disclosure of their personal information. Accordingly, as suggested by recent literature evidence (Atzori et al., 2010) privacy should be protected by ensuring that individuals can control which of their personal data is being collected, who is collecting such data, and when this is happening. Furthermore, the personal data collected should be used only in the aim of supporting authorized services and, finally, the above data should be stored only until it is strictly needed.

In a smart store environment privacy is a really important issue. For instance, if an RFID with sensing capabilities will be deployed in the store to track position of people and control the lighting or heating, the IoT system applied should guarantee that the tracking system does not collect information about the position and movements of individual users, but only considers aggregate users, that people are informed of the scope and the way in which their movements are tracked by the system and finally ensure that data collected by the tracking system will be processed only for the purposes of controlling the lighting and heating and then deleted by the storage system.

Another challenge regarding the interaction with IoT systems as stressed by literature (Guo et al., 2013) is that humans usually carry different kinds of mobile devices (mobile phones, PDAs etc.) with distinct capabilities. Therefore the device heterogeneity has to be taken into consideration when designing an IoT application.

Based on the above discussion on the challenges and opportunities of human interaction with IoT systems, one could easily observe that in order to facilitate the development of a healthy relationship between smart applications and customers, a generic system framework is considered essential, to provide a set of mechanisms for safety and privacy, human behaviour analysis, and information sharing. In fact, such a framework could address most of the issues mentioned previously and provide a uniform interface for information distribution/access by various applications.

1.8 Connecting the dots between IoT and multisensory in-store UX

Following the analysis of the challenges and opportunities of retail environmental smartification, more light should be shed on turning the customer-store interaction into a unique consumption experience.

The Internet of Things opened a new world of experiences and deep connectivity for both consumers and businesses. As reported by software developers of IoT applications (Coenraets and Ward, 2015) IoT technologies are dramatically changing the kinds of experiences software developers are building. In this new era of computing where everyone and everything is connected, applications are no longer considered terminals for data entry, but the primary channel of customer engagement for businesses.

It has been further reported (Coenraets and Ward, 2015) that multi-sensory applications using IoT technologies integrate and process multiple inputs across multiple devices to deliver contextual, connected and viral experiences and in this new era such applications have moved beyond customer senses and use five primary inputs to create a 360 degree view of the context, and then use that context to deliver the most relevant, engaging and connected experience. The aforementioned inputs, including the user input, the environment that he acts in, the user behavior and the people surrounding him, their social identity and the input of the devices used, are presented in Figure 3.

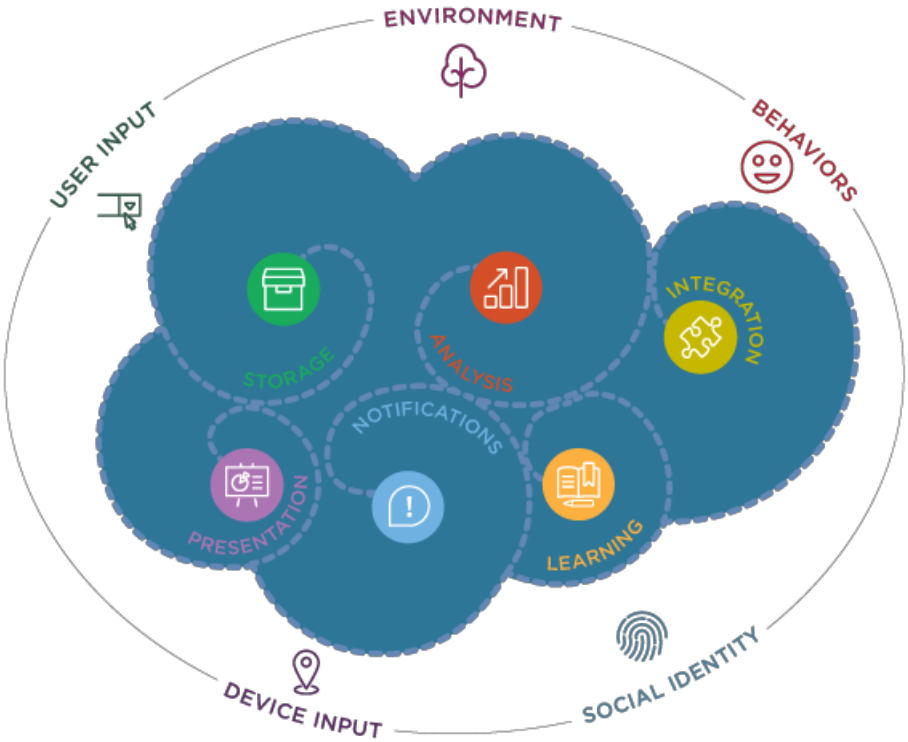

Figure 3. Creating multisensory experiences using IoT applications

(Source: Coenraets and Ward, 2015)

Recent research evidence (Manyika et al., 2013) suggests that improving an in-store experience is utilizing pervasive technologies, such as IoT platforms to create multisensory applications and experiences. Multi-sensory applications are reported (Coenraets and Ward, 2015) to be extroverted, meaning that they initiate interactions and proactively engage users using multiple channels (push notification, email, SMS, UI strategy etc.) across multiple devices. Along similar lines (Manyika et al., 2013) such applications use tools such as digital mirrors, touch screens that show what is not available in-store and can be ordered in place, and digital signage solutions that offer consumer the possibility to view and purchase on a single screen, without walking around in the store. It has been further supported (Jablanović et al., 2015.) that the latest IoT technologies aiming at the creation of multi-sensory in-store experiences and have began to be implemented since the end of 2015 are POS-technology (point of sale), cloud based point of sale systems in order to make cashier solutions easier, beacons to provide in-store analytics and marketing solutions, information from wearable technology such as watches, glasses and fitness monitors, augmented reality and interactive window displays.

Some of the main IoT applications for creating multi-sensory experiences in a smart store environment are reported (Atzori et al., 2010) to be adapting the store environment's heating conditions to the current outdoor weather conditions and the time of the day and monitoring using IoT technologies, such as WSNs, the customers' behavior in order to select the appropriate type of music or emit specific odors that will make them more enthusiastic and increase their desire for shopping. Manyika et al (2013) further suggested that the combination of e-commerce with in-store shopping is another example of multi- sensory strategy application, for generating consistent retail experiences.

Multi-sensory applications are always learning. On this basis, Coenraets and Ward, (2015) argue that such applications are able to capture user behaviors across connected devices and leverage their big data storage and analysis infrastructure to recognize patterns, providing predictive experiences and personalized recommendations. IoT technology could be used, to capture and analyze how consumers use their smart devices to fulfill their in-store shopping experience demands, since as shown by research findings (Longo et al., 2013) 36% of consumers would like to access product information by scanning a barcode with their smartphone and 14% would like to use it for payment.

Visualization could also be considered as a useful tool for creating multi-sensory shopping experiences in a store environment. Literature evidence (Domingo, 2012) point out that IoT ecosystems allow the combination of audio narration, animations, interactive exercises, videos, text and graphics for the creation of an interactive environment. This could lead to the increase of the customers' satisfaction, engagement, and entertainment by creating a multi-sensory high- quality shopping experience.

Based on the above discussion, one could easily understand the significance of delivering more engaging and pleasing experiences for customers using IoT and multi-sensory UX applications, in order for retail companies to become part of the new generation businesses of the future.

By deducing this chapter one may formulate certain questions concerning the present study. For instance, when it comes to a supermarket environment what are most popular smart applications for the customers that combine IoT and multisensory UX techniques? What challenges and opportunities could derive by embedding this kind of applications in AB Vassilopoulos supermarket? In what way will they change the customer's shopping experience? These questions will be addressed in the underlying thesis by conducting research in order to explore and investigate the input of multi-sensory applications in AB Vassilopoulos supermarkets, combined with IoT technologies for the creation of a superior customer experience.

Chapter 2- Methodology

2.1 Research purpose

As mentioned, in the previous sections the objective of the dissertation is to provide novel insights concerning the retail environmental smartification of AB Vassilopoulos Greek supermarket chain stores using IoT and multi-sensory UX applications. In order to achieve this objective the study initially emphasizes on the exploration of the current state of AB Vassilopoulos stores, the way that retail environmental smartification could change the overall shopping experience and the challenges and opportunities of AB Vassilopoulos stores environmental smartification. Additionally, an investigation towards the consumers' preferences and perceptions regarding AB Vassilopoulos stores environmental smartification is further developed. This section presents the methodological aspects of the study, concerning the author's view, the research purpose, and the theoretical approach, while specifying the way that that the primary and secondary data were collected and analyzed, in order to answer the project's main research question: "How could IoT technologies and multisensory UX techniques be used to smartify the AB Vassilopoulos supermarkets' environment?".

2.2 Research approach

The present study has been developed based on a combination between deduction and induction approach; a thorough and extensive searching on academic literature has provided a picture of the existing body of knowledge regarding the current state of AB Vassilopoulos stores, IoT applications and technologies that could be used to smartify a supermarket environment, the needs, challenges and opportunities of retail environmental smartification and the multisensory information that could be embedded in a supermarket's environment. Subsequently, a qualitative analysis has been conducted to further enrich the literature review findings and interpret in more detail the theoretical perspective of the study (Saunders et al., 2012; Venkatesh et al., 2013), while afterwards a quantitative research was conducted to further investigate the potentials of IoT systems and multisensory UX strategies in a supermarket environment.

From the qualitative perspective, the study has been based on a single-case study. The case study method and design is well-suited to this study because of its ability to answer the research questions appropriately, since it is considered (Saunders et al., 2012) the most conducive method for answering the 'why' and 'how' questions. Additionally, it has been stressed (Yin, 1984) that case study research excels at bringing us to an understanding of a complex issue such as store smartification and UX and can extend add strength to what is already known through previous research. Therefore, as reported in past research evidence (Soy, 1997), researchers from various fields use the case study method to build upon theory, to produce new theory, to dispute or challenge theory, to explain a situation or to provide a basis to apply solutions to situations.

Last but not least, case study results relate directly to the common people everyday experience such as the in-store experience of a consumer while shopping and facilitate an understanding of a complex real-life situation that can be using IoT technologies and applying multisensory techniques to make this experience unique. Past research data (Feagin et al., 1991) indicate that case study is an ideal methodology when a holistic, in-depth investigation is needed. The same evidence (Feagin et al., 1991) suggests that case studies are multi-perspectival analyses. This means that the researcher considers not just the voice and perspective of the actors, but also of the relevant groups of actors and the interaction between them. This aspect of this methodology allows the underlying study to investigate and take into consideration both the customers' and the AB Vassilopoulos company point of view.

Quantitative research is usually linked to a deductive research approach since it is concentrated on the collection of numerical data analyzed through specific statistical techniques in order to test a theory, whereas qualitative is associated with inductive approach expressed through a research design which aims at the enrichment of the existing literature (Saunders et al., 2012). However, there is the capability of a combination between these two approaches that offers a multi-method approach which has been implemented throughout the development of the present dissertation research.

More concretely, the study follows the phenomenological approach which according to studies on research methods (Heidegger and Dahlstrom, 2005) seeks to uncover the meanings of phenomena experienced by individuals through the analysis of their descriptions. Furthermore, phenomenological approaches are based in a paradigm of personal knowledge and subjectivity, and emphasize the importance of personal perspective and interpretation. Similar studies (Van Manen, 1990) indicate that the aim of phenomenological research is to aspire to pure self-expression, with non-interference from the researcher and it is, also, considered especially useful when a phenomenon of interest has been poorly defined. That makes this approach suitable for the study of the slightly explored area of environmental retail smartification, using IoT technologies and multisensory UX techniques, especially when it comes to AB Vassilopoulos supermarket chain.

As discussed previously, in this research project the phenomenological approach will be applied in two stages in order to capture the challenges and opportunities of environmental retail smartification, explore the new consumption experience elements and collect information regarding customers' and eventually come up with a AB Vassilopoulos stores environmental smartification model. In stage one 1, secondary data will be collected by conducting a literature review in order to investigate the existing body of knowledge regarding environmental smartification IoT and multi-sensory UX technologies and applications and the challenges and opportunities regarding of environmental retail smartification. In stage 2, both qualitative and quantitative primary research will be conducted. The qualitative research aims at the exploration of the literature review results and identification of latent structures using these results, while quantitative research will be used to further investigate consumers' preferences and perceptions regarding AB Vassilopoulos stores environmental smartification.

As a third stage, the results of the secondary research and the qualitative and quantitative primary research will be triangulated. Triangulation is defined (Thornhill et al., 2006) as the use of two or more independent sources of data or data collection methods to corroborate research findings within a study. According to Morse (1991), methodological triangulation is the use of at least two methods, usually qualitative and quantitative, to address the same research problem.

This approach offers the advantage of mutual utilization of the positive aspects of each technique. In particular, the qualitative analysis ensures the quality of the data employed in the subsequent quantitative analysis, where confirmatory methods ensure statistical significance of final results. Campell and Fiske (1959) argue that more than one method should be used in the validation process to ensure that the variance reflected that of the trait and not of the method. Thus, the controvergence of agreement between two methods enhances our belief that the results are valid and not a methological artifact.

2.3 Research strategy

In this section the research strategy of the project will be analyzed and described in detail. The study is interested in determining how could IoT technologies and multisensory UX techniques be used to smartify the AB Vassilopoulos supermarkets' environment. The overall research strategy is presented diagrammatically in Figure 4.

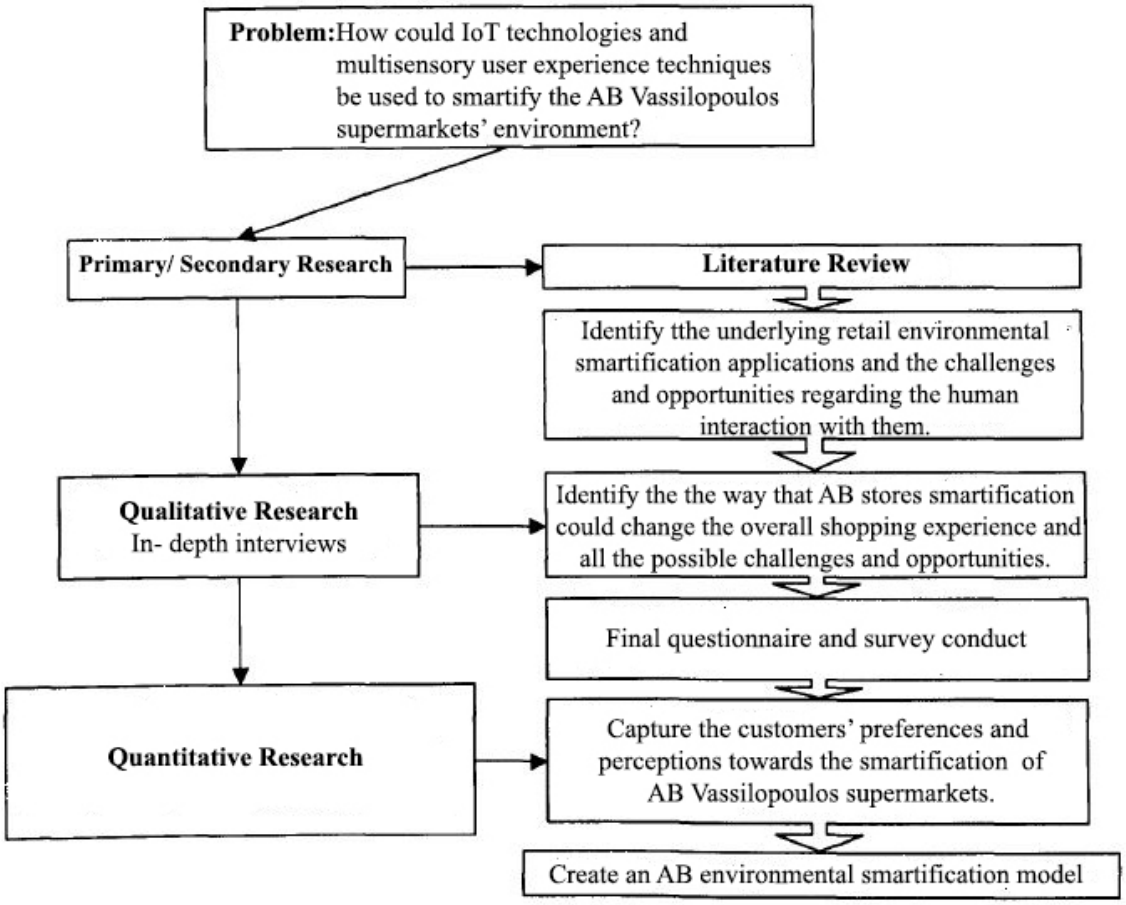

Figure 4. Research strategy

The literature review was the first step of the research, for the collection of secondary data to determine what prior studies have determined about this issue. In stage 1, secondary sources were selected from databases, such as Emerald, ScienceDirect, and Elsevier. The following keywords have been entered within the literature search: IoT; consumption experience; IoT applications; IoT technologies; human interaction with IoT; multisensory UX; IoT challenges and opportunities; retail smartification; IoT applications in supermarkets etc. The articles, books, and reports that were gathered from the databases mentioned above as a result of the search were reviewed thoroughly, and those most relevant to the search topic were chosen. Finally, 62 of 225 articles were chosen.

After studying thoroughly the literature review findings, both consumer facing and business facing questions were formed regarding each theoretical subject. These questions were used for conducting semi- structured interviews with the Business Intelligence & Strategy Director of AB Vassilopoulos supermarkets enterprise and customers, to seek new insights' regarding the current state of AB Vassilopoulos stores, the way that retail environmental smartification could change the overall shopping experience, the challenges and opportunities of AB Vassilopoulos stores environmental smartification and the perception this smartification. The conducted interviews can be found in Appendix A.

It has been reported (Thornhill et al., 2006), that qualitative methods offer an effective way of collecting a large amount of data from sizable population that can be easily compared. Therefore, the fundamental goal drove the collection of qualitative data and the subsequent data analysis was the creation of a questionnaire that could provide the research project with all the necessary information for the creation of an AB Vassilopoulos stores environmental smartification model.

Following the qualitative data analysis, the questionnaire was designed on the basis of the findings (stage 1, stage 2) and was administrated offline using the kiosk mode for asking customers questions while shopping in AB Vassilopoulos supermarkets and online by Surveygismo research platform, and it contained various types of questions, mainly multiple choice checkboxes, regarding the respondents perceptions and preferences when it comes to AB Vassilopoulos stores smartification, the way that retail environmental smartification could change the overall shopping experience and the challenges and opportunities regarding AB Vassilopoulos stores environmental smartification. Some attribute questions were also used, including characteristics such as age, gender, education, and income. Relevant literature (Thornhill et al., 2006) suggests that these questions are used to explore how opinions and behavior differ between respondents as well as to check that the data collected are representative of the total population. A sample of the final questionnaire is available in Appendix B.

A suggested by Robson (2002), the case study method, with its use of multiple data collection methods and analysis techniques, provides researchers with opportunities to triangulate data in order to strengthen the research findings and conclusions. Therefore, after the quantitative data analysis the results of the secondary research and the qualitative and quantitative primary research were triangulated, and the main research findings were used for the creation of an AB Vassilopoulos stores environmental smartification model.

2.3.1 Sample

The qualitative data were collected by conducting half an hour semi-structured interviews. For interviewing customers the convenience sampling method was used which is defined (Thornhill et al., 2006), as a specific type of non-probability sampling method that relies on data collection from population members who are conveniently available to participate in study. In business studies this method can be applied in order to gain initial primary data regarding specific issues such as perception of image of a particular brand or collecting opinions of perspective customers in relation to a new design of a store, therefore it was considered a very suitable method for this research project.

The final number of the interviews was decided based on grounded theory. As reported by literature (Strauss and Corbin, 2008) grounded theory suggests constantly comparing the data being collected until 'theoretical saturation' is reached, which occurs when data collection ceases to reveal new data that are relevant to a category of study, where categories have become well developed and understood and relationships between categories have been verified. Based this theory, 20 interviews were conducted. The respondents aged between 22- 50 years and 65% were women.

Furthermore, a semi- structured interview ,presented in Appendix was conducted with AB Vassilopoulos's intelligence manager Elias Symeonides in order to provide the research with precious "inside" information, by giving his professional opinion regarding consumers' both consumption behavior and purchase behavior and AB Vassilopoulos company vision and intentions regarding retail environmental smartification.

Prior to the final distribution of the questionnaire, a first draft was developed to test the efficiency of the questionnaires design and was distributed to 10 participants randomly. Once it was tested and all the necessary changes were made, the convenience sampling method was applied again, in order to easily gather a sufficient number of responses and the questionnaire was distributed in two ways, electronically using the internet and in the form of interviewer administrated questionnaires in AB Vassilopoulos supermarkets recording each respondent's answers, since capturing the consumers while shopping can lead to more valid and reliable results. For the purposes of the research nine (9) AB Vassilopoulos stores were selected, two in Alexandroupolis, three in Athens, two in Thessaloniki, one in Xanthi and one in Komotini. These regions were selected due to their various differences in population, tradition, and lifestyle that could increase the likelihood of achieving a more representative sample. The sample consisted of 802 consumers. The participants were mainly women (73.1%), as according to recent evidence (Nilsson et al., 2015) mostly women shop at supermarkets, and were aged between 17 and 58 years.

2.4 Analysis

This section presents the methods implemented for the analysis of the qualitative and quantitative data. Following the qualitative data collection by conducting semi- structured interviews, the first step in this analysis involved Generic Content and Differential Analysis, which is defined by Philip Bernard (2011), as a method used to categorize and codify interview transcript. The procedure described below was based on Philip Bernard's approach on content analysis.

At stage 1, notes were made after each interview regarding the topics discussed in that interview based on the findings of the literature review and memos were written about ways of categorizing data. Following the initial notes, interviews were read through again and several headings were written down to describe all aspects of the content, excluding dross, meaning all the unusable information in the interviews that are unrelated to the topic of the research project.

This stage of the process is called open coding and includes the generation of freely defined categories. During the second stage the initial categories were grouped together under higher order headings, aiming at reducing their number by collapsing some of the ones that are similar into broader groups. This final categorization, meaning the creation of different stand alone dimensions, led to the creation of a final list of categories and their sub- categories. Following that, the Generic Content and Differential Analysis matrix was created including each category's description, based on theory and literature review, along with the percentages of the participant's responses for each category and their demographic characteristics (sex, age). This matrix will be presented in the result chapter. As mentioned before, the categories generated along with the coded answers were used for the creation of a questionnaire, in order to conduct a survey to the quantitative research.

Following the quantitative research, the data were analyzed online using Surveygismo research platform. At first, a summary report was created including all the results from analyzing all of the open text, textbox, and radio button questions. The analysis of the radio button questions includes a pie- chart along with a table with the answer options, the percentages, and the count of the number of respondents providing each answer option. When it comes to demographic question there is also a statistics grid. The checkboxes questions' results embrace a bar chart, and a table of answer options that demonstrate the frequency in which every answer option was selected.

The main part of data analysis includes Crosstab and Descriptive Statistics Analysis. Cross tabulation allows the comparison of two questions and the identification of trends and patterns in your data. In addition, the Chi-square analysis is used along with cross tab analysis to confirm if the data from the selected questions are correlated.

2.5 Limitations of the Research

Three limitations affected the present dissertation study the available time period, the low response rate and the language.

The provided period for the conduction of this study affected, naturally, each and every aspect of the dissertation as it was highly anticipated. Due to this fact, the data collection procedure was compressed in order to proceed with the data analysis procedure within two months. This led to a limitation in relation to the size of the sample and consequently to generality issues. Furthermore, the followed methodological choice of mixed methods required a "sacrifice" in order to provide the benefits of a more holistic view of the theory: greater effort regarding time planning for the second phase of the data collection and analysis procedure based on the single-case study strategy, a limitation that is stated by Iavankova et al. (2006) as well for this type of methodological choice. Eventually, the available time for completing the dissertation study became precious and possibly the greatest limitation of the study.

The low response rate limitation was partially affected by the time factor as well, since the planned schedule could be organized differently with respect to data collection process. However, the source of this limitation derived mainly from the participants themselves, a statement that is also supported by Fu et al. (2013) as previously mentioned. More concretely, trust and refusal issues were emerged since the majority of the approached customers presented unwilling behaviour towards a potential participation in a survey while shopping in various AB Vassilopoulos supermarkets, therefore the questionnaires were also distributed electronically. At this point, an exception should be mentioned in association with the customers that were interested in participating, nevertheless, the context of this particular study did not attract them. The low response rate of the approached customers while shopping in various AB Vassilopoulos supermarkets led to unpredicted changes to the conduction schedule and thus it negatively affected the available time for the analysis and the writing parts of the dissertation.

Last but not least, in order to address properly this constrain the questionnaire and the interview questions were translated in Greek so as to foster and facilitate the participation of the responders. It may be considered as a limitation especially, yet not solely, in the data analysis process of the semi-structured interviews.

Chapter 3- Results

This chapter reports the results of the study. Following the mixed methods research triangulation methodology, the results of quantitative and qualitative measures are reported separately. Qualitative measures for consumers were analyzed, reduced, categorized, and presented. Quantitative measures for the surveys are presented using cross tabulation analysis results and descriptive statistics. In analyzing the quantitative data, the Surveygismo research platform was used to determine the results of this study. The results are presented analytically in Appendix C. Qualitative measures for consumers were analyzed, reduced, categorized, and presented.

3.1 Qualitative results

As mentioned in section 2.4 (Analysis) the customers' interview data were analyzed and organized into major categories of thematic topics using Generic Content and Differential Analysis. The results of the analysis that are presented and summarized in the Generic Content and Differential Analysis matrices (Tables 3.1 and 3.2) were used for the creation of the quantitative research questionnaire.

Categories	Definition of category	Subcategories	Sum		Sex				Age range					
					M		F		18-24		25-34		35-54	
1.0 Advantages	Perceptions towards the existence of advantages that motivate customers to visit AB Vassilopoulos	Store location	8	40%	1	13%	7	88%	6	75%	2	25%	0	0%
		Variety of products	6	30%	2	33%	4	67%	3	50%	2	33%	1	17%
		Quality of its products	6	30%	2	33%	4	67%	4	67%	1	17%	1	17%
		Reasonable prices	5	25%	2	40%	3	60%	4	80%	1	20%	0	0%
		Discounts	2	10%	0	0%	2	100%	2	100%	0	0%	0	0%
		Pleasant environment	13	65%	6	46%	7	54%	6	46%	4	31%	3	23%
		Good service	4	20%	3	75%	1	25%	1	25%	1	25%	2	50%
2.0 Smart applications	Perceptions towards the possible smart applications that can be installed in AB Vassilopoulos	Interactive screens allowing shopping before /without getting in the store or ordering an available products	18	90%	7	39%	11	61%	12	67%	3	17%	3	17%
		Customer behavior observation for predicting their future needs	5	25%	3	60%	2	40%	2	40%	2	40%	1	20%
		Smart devices used as shopping assistants	15	75%	3	20%	12	80%	9	60%	4	27%	2	13%
		Smart scanning devices providing additional information about the store and its products.	17	85%	8	47%	9	53%	9	53%	5	29%	3	18%
		Messages with additional information about the product popping out as soon as a customer passes by	8	40%	3	38%	5	63%	4	50%	2	25%	2	25%
		Interactive navigation signs within the store	12	60%	5	42%	7	58%	5	42%	5	42%	2	17%
		Interactive screens for store evaluation	16	80%	6	38%	10	63%	12	75%	2	13%	2	13%
		Wearable technologies	2	10%	0	0%	2	100%	1	50%	1	50%		0%
		Virtual reality	8	40%	4	50%	4	50%	4	50%	1	13%	3	38%
		Interactive shopping windows	9	45%	6	67%	3	33%	4	44%	2	22%	3	1%
		Customer behavior and statement observation for adjusting the stores' internal conditions	8	40%	4	50%	4	50%	2	25%	3	38%	3	38%
		Easy payments using credit cards or product scanning	19	95%	7	37%	12	63%	11	58%	5	26%	3	16%
		Dynamic pricing	18	90%	7	39%	11	61%	10	56%	5	28%	3	17%
		Adjusting store' s conditions to decrease energy consumption	20	100%	8	40%	12	60%	12	60%	5	25%	3	15%

Table 3.1 Generic Content and Differential analysis matrix (1/2)

Categories	Definition of category	Subcategories	Sum		Sex				Age range					
					M		F		18-24		25-34		35-54	
3.0 Shopping experience	Perceptions towards the shopping experience after installing smart applications in AB Vassilopoulos	Interactive	7	35%	3	43%	4	57%	4	57%	1	14%	2	29%
		Pleasant	16	80%	7	44%	9	56%	8	50%	4	25%	4	25%
		Comfortable	6	30%	5	83%	1	17%	3	50%		0%	3	50%
		Easy	11	55%	5	45%	6	55%	6	55%	3	27%	2	18%
		Personalized	5	25%	3	60%	2	40%	1	20%	2	40%	2	40%
		Effective	5	25%	1	20%	4	80%	3	60%	2	40%	0	0%
		Unreliable	4	20%	2	50%	2	50%	3	75%	0	0%	1	25%
		Impersonal	5	25%	1	20%	4	80%	5	100%	0	0%	0	0%
		Complex	6	30%	3	50%	3	50%	4	67%	2	33%	0	0%
4.0 Challenges	Perceptions towards the existence of challenges after installing smart applications/ systems in AB Vassilopoulos	Overconsumption	5	25%	2	40%	3	60%	4	80%	0	0%	1	20%
		Difficulties in adjusting to smart applications	12	60%	6	50%	6	50%	5	42%	4	33%	3	25%
		Privacy issues	9	45%	3	33%	6	67%	5	56%	3	33%	1	11%
		Fear of using advanced technologies	5	25%	3	60%	2	40%	2	40%	3	60%	0	0%
		Lack of human interaction	9	45%	4	44%	5	56%	6	67%	2	22%	1	11%
		Staff reduction	14	70%	5	36%	9	64%	9	64%	3	21%	2	14%
		Automation	5	25%	2	40%	3	60%	3	60%	1	20%	1	20%
		Reducing customers' entertainment while shopping	4	20%	2	50%	2	50%	2	50%	2	50%		0%
5.0 Opportunities	Perceptions towards the existence of opportunities after installing smart applications/ systems in AB Vassilopoulos	Easy shopping	6	30%	2	33%	4	67%	5	83%	0	0%	1	17%
		Fast shopping	20	100%	11	55%	9	45%	12	60%	5	25%	3	15%
		More i informed customers	10	50%	3	30%	7	70%	6	60%	2	20%	2	20%
		Effective shopping	6	30%	1	17%	5	83%	5	83%	1	17%	0	0%
		Reducing shopping cost	9	45%	2	22%	7	78%	5	56%	2	22%	2	22%
		Pleasant shopping environment	16	80%	7	44%	9	56%	8	50%	4	25%	4	25%
		Rewarding loyal customers	12	60%	5	42%	7	58%	5	42%	4	33%	3	25%
		Personalized sales	5	25%	3	60%	2	40%	2	40%	1	20%	2	40%
		Increase in customer satisfaction	7	35%	2	29%	5	71%	5	71%	0	0%	2	29%
		Focusing on customer problems and needs	9	45%	4	44%	5	56%	5	56%	2	22%	2	22%

Table 3.2 Generic Contend and Differential analysis matrix (2/2)

3.2 Quantitative results

3.2.1 Demographics

This section reviews the participants' demographics including age, gender, marital status, level of education, personal monthly income, and place of residence. The age and the gender of the consumers was investigated to determine if there are any differences between the smart application preferences of various age and gender groups. Marital status was also of interest to determine the differences existing in the shopping behavior of people with and without families. The level of education and personal monthly income was considered in the light of the knowledge of consumers with different educational level and income on various smart supermarket applications and their benefits and possible challenges.

The majority of the participants (≈35%) were aged between 25-34 and 35 and 54 years old, 25.5% of the respondents were aged between 18 and 24 years, 3.9% were aged over 55 years, and only 0.6% was under 18. The participants' average age was 27.8 years. Approximately seventy percent of the respondents (71.3%) were female and the rest (28.7%) were male.

When it comes to marital status the results indicated that 51.6% of the participants were single, 43% of them were married, while the rest of them were divorced (4.4%) or widowed (0.9%). Over half of the respondents (60.2%) had a bachelor's degree, 18.1% of them had some college without getting their degree and 20.3% had a post graduate degree.

Participants were asked to identify their approximate personal monthly income and 40 of them didn't respond to the question. The majority of those who answered (43.3%) reported that their personal monthly income was up to 499 Euros, 32% reported a personal income between 500 and 1000 Euros per month, 15.6% of the respondents reported a personal monthly income between 1001 and 1500 Euros and only 40 people (5.3%) reported a personal monthly income between 1501 and 2000 Euros. The rest 3.8% of the participants reported a personal monthly income over 2001 Euros.

3.2.2 AB Vassilopoulos shopping experience

All survey participants are AB Vassilopoulos supermarkets' customers and they were asked to express their preferences regarding shopping at AB Vassilopoulos supermarket stores by answering a series of questions. More specifically, the three questions of this category aimed at exploring the loyalty of AB Vassilopoulos customers, the reason that they choose to visit this specific supermarket chain stores and the existence of factors that make customer dislike AB Vassilopoulos store environment. The results of the analysis of these questions using the Surveygismo research platform will be presented below.

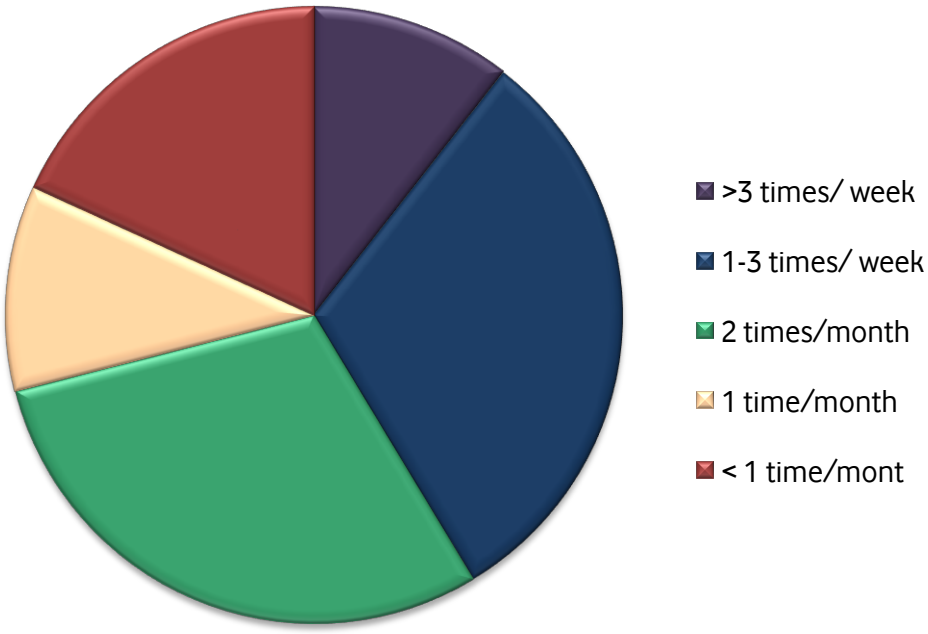

Figure 5. Frequency of customer visits in AB Vassilopoulos supermarkets

In order to present the sample's frequency of visits in AB Vassilopoulos stores a chart pie has been developed (see Figure 5) indicating that 30.8% of the respondents visit AB Vassilopoulos supermarkets 1 to 3 times per week, another 29.7% of the participants visit AB Vassilopoulos supermarkets 2 times a month, 18.2% of the customers visits AB stores less than once a month, 10.8% shops at AB Vassilopoulos supermarkets approximately once a month, while the rest of them shops at AB stores more than 3 times per week.

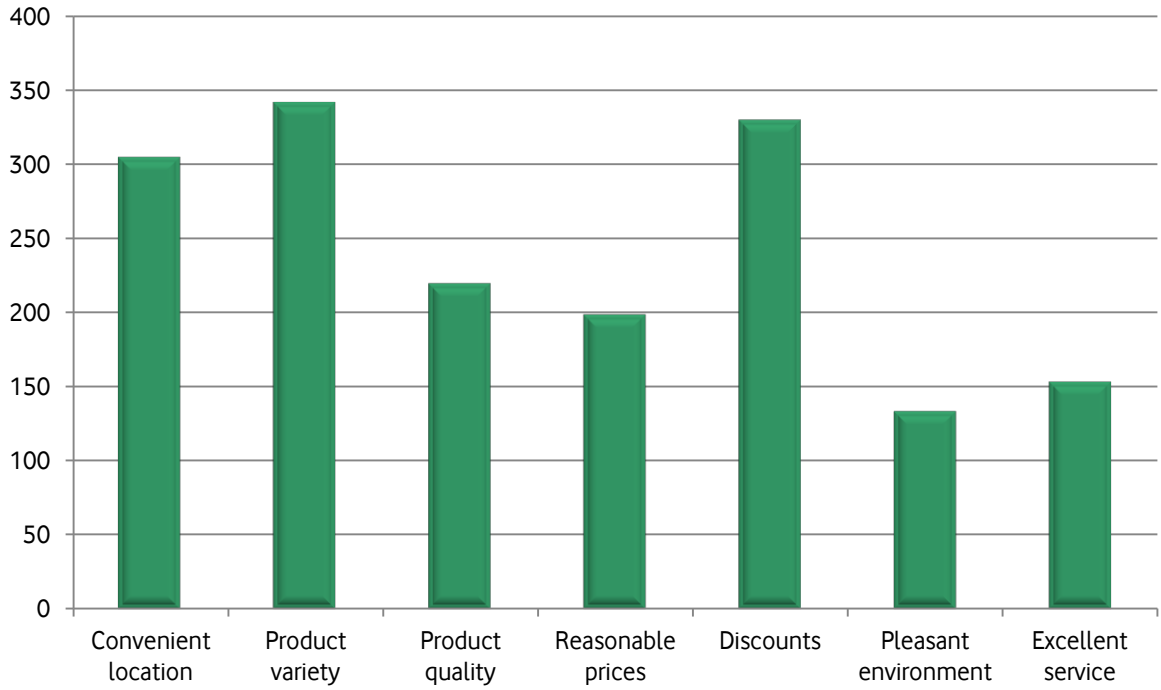

Figure 6. Selection criteria for AB Vassilopoulos supermarket stores

Figure 6 is a visual representation of the most popular factors that customers chose to visit AB Vassilopoulos supermarkets. Participants seem to prefer visiting AB Vassilopoulos stores due to their big product variety (49.4%), the regular discounts (47.6%), their convenient location (44%), their products' quality (31.7%), their reasonable prices (28.7%) their excellent service (22.1%) and their pleasant environment (19.3%).

When it comes to customers' satisfaction 77.8%of the participants reported that they are totally satisfied with AB Vassilopoulos supermarket stores. The rest of the respondents seem to have some complaints regarding the lack of staff, checkout lines and the dull environment.

3.2.3 Smart applications

Participants responded to their preferences regarding the smart applications that can be embedded to smartify the AB Vassilopoulos in- store environment by answering a series of check box questions. Fourteen possible smart applications were selected by conducting literature review and qualitative research. The first question was about the applications that the participants would prefer. The following graph can lead to a first understanding of the consumer preferences.

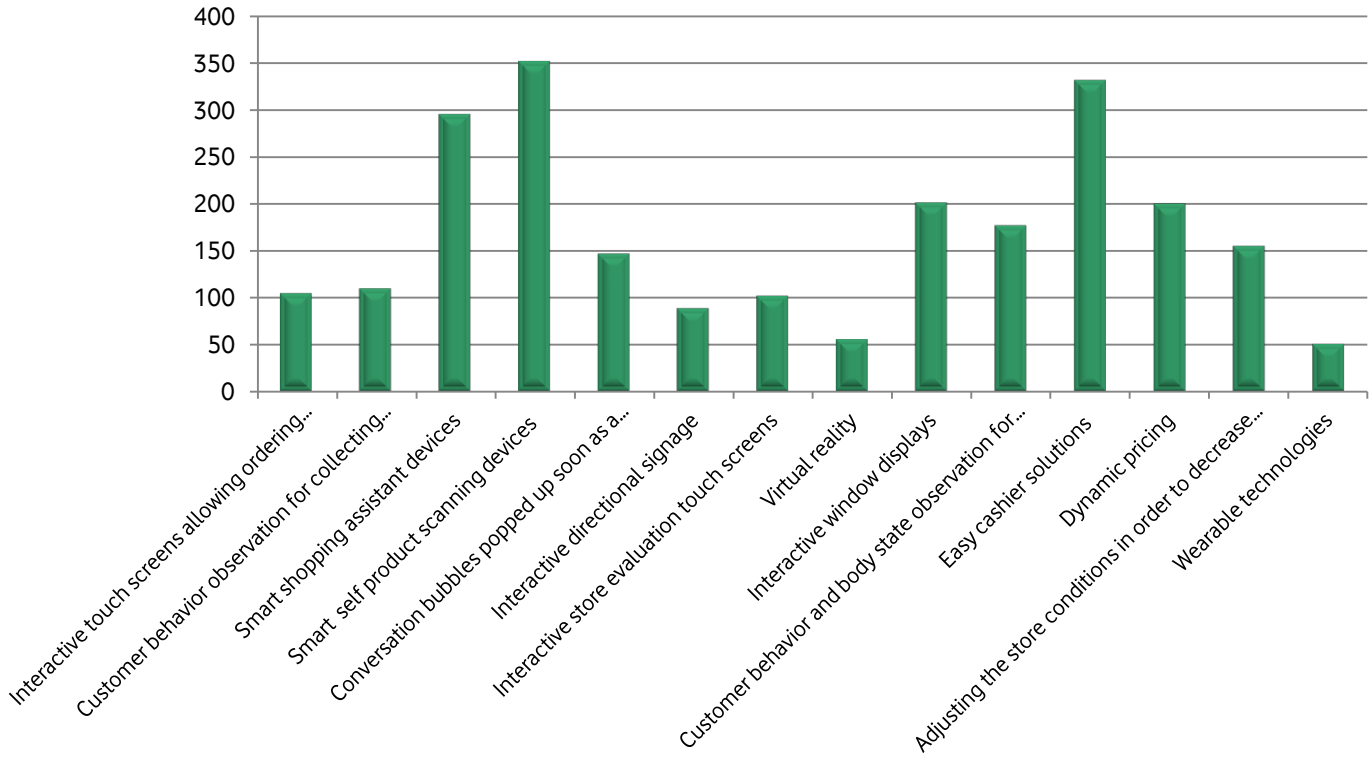

Figure 7. Consumers' smart application preferences

By observing the provided Figure 7 above one could easily understand that the three most popular smart applications are using smart self product scanning devices (47.6%), easy cashier solutions (44.9%) and smart shopping assistant devices (40%). Some customers would like some additional applications to exist in AB Vassilopoulos stores such as interactive store evaluation touch screens (31.9%) dynamic pricing (27.1%), interactive window displays (25%) customer behavior and body state observation for adjusting stores' conditions (21.9%), adjusting the store conditions in order to decrease energy consumption (21%) and conversation bubbles popping up as soon as a customer passes by various products (19.9%). The rest of the applications reach below 15%.

When asked if there is a need for applying smart systems in AB Vassilopoulos supermarkets 71.9% of the respondents answered positively. Respondents were, also, asked if they use any smart devices while shopping. The majority of the respondents (66%), answered "no", while participants who answered positively, mentioned that they use their smart devices, mainly smartphones to compare prices among the store products or different store products, to check the discounts, research products that they don't usually use, check out their Pockee app, make shopping lists and various notes, track their spending, search for recipes or order online products that are not currently available in a specific store.

3.2.4 Smart store challenges, opportunities and shopping experience

Participants responded to their perceptions regarding AB Vassilopoulos smart stores by answering a series of check box questions. More specifically, the three questions of this category aimed at exploring the new shopping experience and existing opportunities and challenges of AB Vassilopoulos stores environmental smartification.

The majority of the participants (70.9%) support that there is a need for applying such systems in AB Vassilopoulos supermarkets. The respondents seem to believe that the shopping experience will become easier (41.7%), more pleasant (39.7%), more interactive (31.4%), more comfortable (36.6%), and more effective (32.1%). They also report that this experience could be impersonal (15.5%), complex (10.3%), personalized (7%) and only 2.1% of the customers seem to find this new smart shopping experience unreliable.

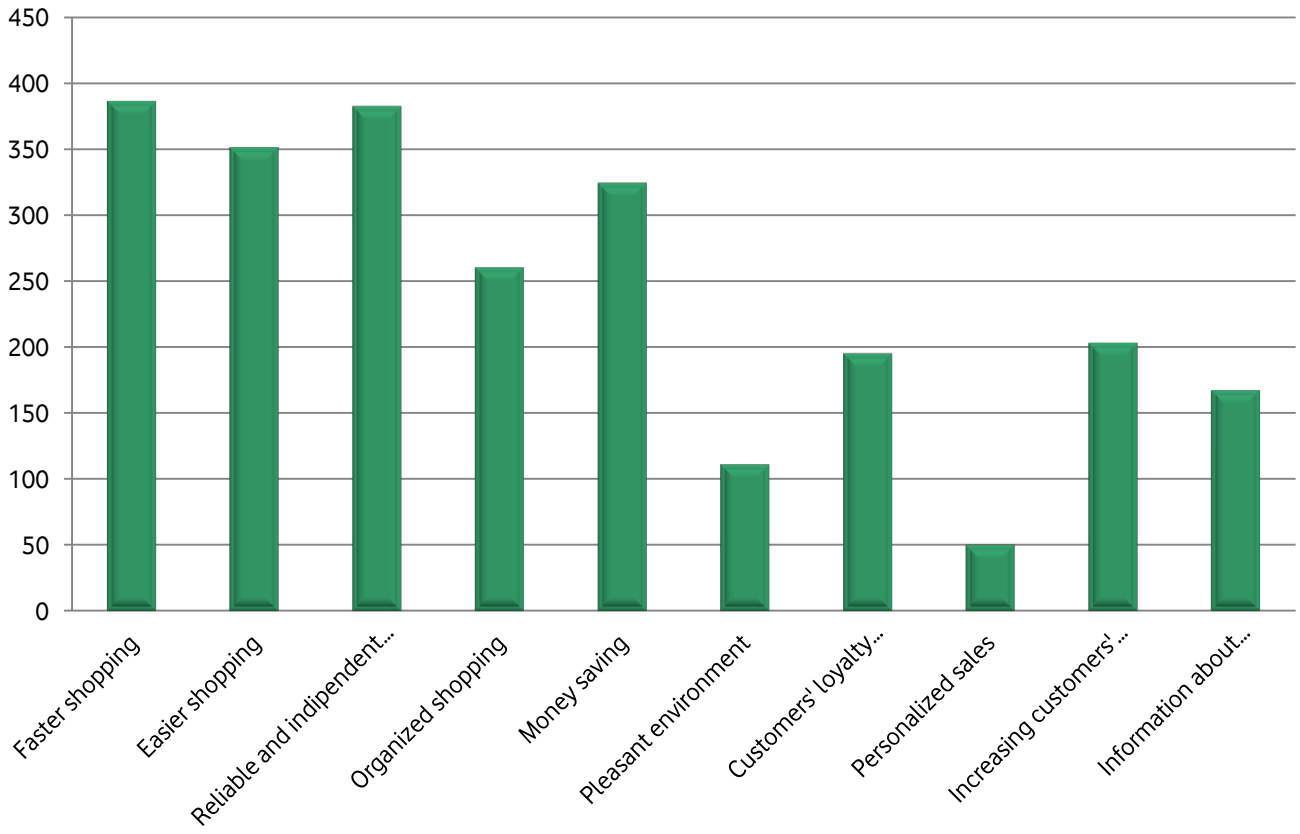

Figure 8. Consumers' perceptions towards the opportunities of AB Vassilopoulos supermarkets smartification

The figure presented above (Figure 8) provides crucial information in relation to the participants' perception towards the existing opportunities of installing smart systems in AB Vassilopoulos supermarket stores. More concretely, over half of the respondents (52.5% and 51.9%) indicated that smart applications could lead to faster shopping and more reliable information about the store and the products available for customers. Furthermore, 47.7% of the participants report that shopping would become easier, money saving (44.4%) and more organized (35.3%). Almost 30% of the respondents (26.5%) believe that smart applications would reward loyal customers, while others support that customers will be more satisfied (26.7%) and they could have the chance to express their concerns and complains regarding the store service and environment (22.7%). Last but not least, 15.1% of the customers report that smart applications can lead to the creation of a more pleasant shopping environment and to more personalized sales (6.8%).

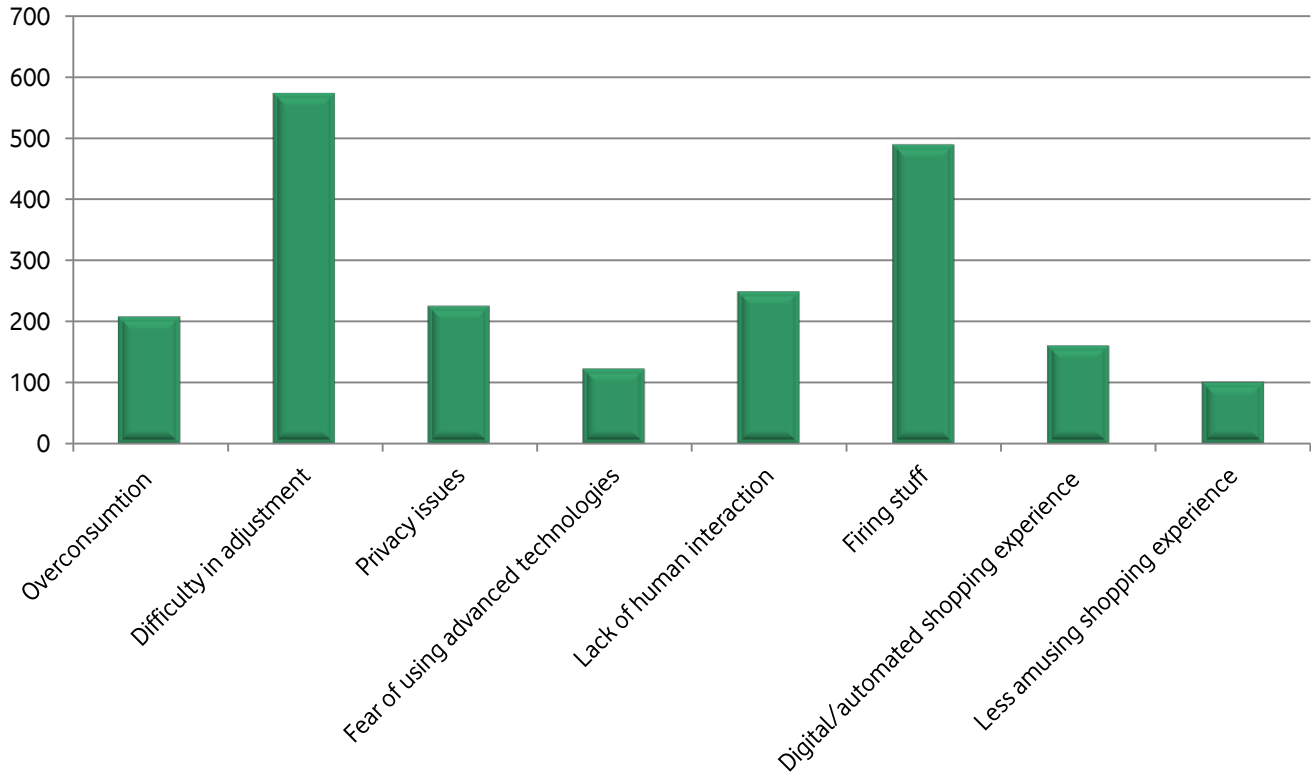

Figure 9. Consumers' perceptions towards the challenges of AB Vassilopoulos supermarkets smartification

When it comes to smart application challenges as presented in Figure 9 the majority of the participants (76.1%) believe that customers will find it difficult to adjust and 64.9% support that a store's smartification could lead to stuff reduction. In addition, some of them support that a smart shopping environment could cause lack of human interaction (33.1%), privacy issues (29.9%), and overconsumption (27.7%) and create a more digital and automated shopping experience (21.4%). 16.4% of the participants think that many customers will be afraid of using such advanced technologies and that the overall shopping experience will become less amusing (13.4%).

3.2.5 Crosstabulation analysis results

The results of the Surveygismo summary report, presented above should be accompanied with some cross tabulation analysis results in order to capture the preferences of the participants based on their demographic characteristics. More specifically, four cross tabulation matrices will be analyzed, one referring to the participants' smart application preferences in relation with their age, a second referring to the participants' smart application preferences in relation with the educational level that they have completed, a third referring to the participants perceptions regarding the new smart shopping experience in relation with their age, and a fourth referring to the participants perceptions regarding the new smart shopping experience in relation with the educational level that they have completed. In all the crosstabulation tables discussed below, the p-value was calculated to be lower than 0.05, which means that the results of the questions used are likely to be correlated and further analysis can be conducted. All these tables along with the ones with a p-value higher than 0.05, whose results were not taken under consideration, can be found in Appendix C.

The crosstabulation analysis results have shown that participants of the 18-24 age group would mostly prefer applications such interactive as directional signage within the store (51.1%), smart self product scanning devices providing additional information about the store and its products (48.4%), smart shopping assistant devices (46.3%), and easy cashier solutions using credit cards or product scanning (43.7.1%). The most popular applications to consumers aged between 25 and 34 years are smart self product scanning devices providing additional information about the store and its products (55.6%), easy cashier solutions using credit cards or product scanning (44%), interactive as directional signage within the store (43.6%) and smart shopping assistant devices (42.5%). Easy cashier solutions using credit cards or product scanning (45.9%), interactive as directional signage within the store (44.6%) and smart self product scanning devices providing additional information about the store and its products (40.1%) are the most popular applications according to respondents aged between 35 and 54 years. Consumers aged over 55 years prefer easy cashier solutions using credit cards or product scanning (64.3%) and interactive directional signage within the store (60.7%).

Easy cashier solutions using credit cards or product scanning, and smart self product scanning devices providing additional information about the store and its products or used as shopping assistants and interactive as directional signage within the store are also the most popular smart applications of all educational level participants.

The majority of the participants of all age groups seem to believe that the shopping experience will become easier, more pleasant, and more comfortable. Furthermore, over 30% of the participants aged 18-34 or over 55 years have reported that shopping will become more effective, too.

Respondents that haven't gotten into high school reported that the smartification of AB Vassilopoulos supermarkets will make the shopping experience easier (50%) and more comfortable. The majority of the customers that have graduated high school or have a bachelor's degree seem to believe that shopping will become easier, more comfortable, as well as more pleasant. Participants with a post graduate degree support that smart applications can lead to an easier (43.3%), more pleasant (42.67%), interactive (40.6%), and effective (40%) shopping experience.

Chapter 4- Findings

This chapter presents the findings of the mixed methods, qualitative and quantitative, that have been implemented throughout the survey. The chapter is hereby analyzed through three sections which integrate different sub-sections in order to analyze the results of the established research questions presented in the previous chapter. More concretely, the first section reflects the current state of the AB Vassilopoulos supermarket based both on the customers' and the company's point of view. The second section presents the perceptions regarding the smartification of AB Vassilopoulos supermarket stores, through a "snapshot" taken using both qualitative and quantitative research methods, illustrating the challenges and opportunities, the existence of environmental smartification need and the potential changes in the shopping experience deriving from the stores' smartification. The third section presents the final smartification model, including the proposed applications based on consumer preferences and the company's representative opinion

4.1 The current state of AB Vassilopoulos supermarkets

When it comes to customers' satisfaction 77.8% of the participants reported that they are totally satisfied with AB Vassilopoulos supermarket stores. The rest of the respondents seem to have some complaints regarding the lack of staff, checkout lines, and the dull environment.

The literature review has provided evidence in relation to the AB Vassilopoulos enterprise goals (Sideri, 2014), suggesting that AB Vassilopoulos is a premium quality supermarket chain that offers its customers a great variety of quality and affordable products. The responses of the participants of the survey shade more light into these findings, with 49.4% of the consumers reporting visiting AB Vassilopoulos supermarkets due to their big product variety, 47.6% due to the regular discounts, 31.7% due to their products' quality, while 27.8% of the participants prefer AB Vassilopoulos stores based on their reasonable product prices.

Additionally, based on literature review evidence (Tzivakou and Sabour, 2014), AB Vassilopoulos company is focusing on launching innovative systems and techniques and embedding new technologies in order to create interactive and pleasant store environments, leading to a superior shopping experience, always based on the consumers needs. For achieving this goal, the same evidence (Tzivakou and Sabour, 2014), suggests that the AB Vassilopoulos supermarket chain has introduced advanced technologies that provided its stores with faster customer service and more effective inventory management. Additionally, another interesting insight was produced via the interview process of AB Vassilopoulos Business Intelligence & Strategy Director, Elias Symeonides, who he reported that AB Vassilopoulos stores' well organized clustering and segmentation system, the usage of advanced technologies that can capture customers' behavior, the efforts that have been made towards easy navigation, smart product organization based on customer preferences and smart supply chain applications that provide the stuff with more time for customer service have created a personalized shopping experience based on customer needs and offer an excellent customers service and a unique shopping environment. A more direct insight derives from the responses of the quantitative research participants that seem to believe that the excellent service (22.1%) and the pleasant environment (19.3%) are two of the main selection criteria for AB Vassilopoulos supermarkets, while 77.8% of them reported that they are totally satisfied with AB Vassilopoulos supermarket stores.

4.2 Perceptions regarding the smartification of AB Vassilopoulos supermarkets

RQ1: Do you feel that there is a need for smartifying AB Vassilopoulos supermarkets?

Based on the results of the qualitative and quantitative research findings there is a need towards AB Vassilopoulos supermarkets environmental smartification. Over 70% of the customers responded positively to this question, while an insight regarding customers' preferences derives again from Elias Symeonides, who reported that due to the company's past steps towards innovative stores with unique shopping environment AB Vassilopoulos customers are more than ready and they expect from AB Vassilopoulos stores to provide them with more smart shopping solutions.

RQ2: In what way will the AB Vassilopoulos stores smartification change the overall shopping experience?

The literature review has provided evidence in relation to the way that the overall shopping experience will change after a smartifying a retail environment using IoT and multisensory UX applications. This evidence (Huchzermeier and Iyer, 2006) suggest that in-store technologies and multisensory UX elements will facilitate shopping, but also add elements of entertainment and engagement in the physical store environment that provide customers with higher levels of interaction. Elias Symeonides seems to agree through his statement "Customers will be able to shop in a more pleasant and interactive way". The customers, also, seem to believe that the shopping experience will become easier (41.7%), more pleasant (39.7%), more comfortable (36.6%), more effective (31.4%), and interactive (32.1%).

RQ3: What are the opportunities of the AB Vassilopoulos supermarkets smartification?

The study further provides findings regarding the potential opportunities that could derive buy AB Vassilopoulos stores environmental smartification. From the perspective of consumers faster, easier and more organized shopping and money saving are some of the main opportunities that could derive by smartifying AB Vassilopoulos supermarkets. Literature review findings (Osterwalder and Pigneur, 2013) suggest that by installing smart systems a store is able to develop easy-to-use-and-adopt services and providing smart shopping solutions, while Elias Symeonides stated that "Customers will be able to shop easily, track their spending, organize their shopping in a better way and generally have a better quality of life".

The second opportunity refers to the customer- store relationship. As reported by Elias Symeonides "Smart applications will definitely lead to an upper level positive customer- store relationship" and therefore "there will be probably more regular base, loyal customers." Approximately 30% of the customers believe that by embedding smart applications in AB Vassilopoulos supermarkets loyal customers would feel appreciated.

When it comes to customers' satisfaction over half of the respondents (51.9%) indicated that smart applications could provide them with a wide range of reliable information regarding the store's new and existing products, and with the ability to express their concerns and complains regarding the store service and environment (22.7%), and generally increase their satisfaction while shopping (26.7%). Based on literature findings (Domingo, 2012; Jayavardhana et al., 2015) smart systems could lead to the increase of the customers' satisfaction, engagement, and entertainment by creating a superior multi-sensory shopping experience, while (Jayavardhana et al., 2015) providing customers with the ability to give simple and direct feedback, using devices such as smartphones or tablets connected with the stores IoT network.

At this point, it is important to analyze the way that environmental smartification could also provide opportunities for the supermarket chain, such as more effective promotion and advertizing and increased purchased intention by the customers. As reported by literature (Carter, 2014; Williams and Ackerman, 2011) adjusting elements of a store environment such as music or odor or allowing the customers to touch and interact with various products and devices can lead to an increase of the average shopping time and sales. Similar secondary research evidence (Tang et al., 2012; Coenraets and Ward, 2015) suggest that it is easier for smart stores to send promotional messages to customers while shopping after retrieving valuable knowledge about its their buying habits or product preferences and engage them using multiple channels, including push notification, email, SMS, and a UI strategy across multiple devices. Last but not least Ileas Symeonides stressed that "installing all those smart systems in AB Vassilopoulos stores will lead to better more effective targeting and create a more intimate relationship with the customers".

RQ4: What are the challenges of the AB Vassilopoulos supermarkets smartification?

The literature review has provided evidence in relation to the dimensions reflecting the challenges of retail environmental smartification. Jaramillo and Srikant (2007) reported that sharing and collecting data using smart applications can raise significant security concerns. In the context of the previously presented descriptive statistics analysis, customers seem to have similar concerns, since 29,9% of them are worried about possible privacy issues related to the collection of data, the purpose of collecting these data and the reliability of personal information storage systems. Additionally, the present research question investigation could be further enriched by the provided viewpoint of Elias Symeonides who stressed that AB Vassilopoulos recognizes the high importance of personal data for the customers; therefore, they can be sure that their privacy is protected.

In addition, in the context of the present research question, the majority of the customers (76.1%) reported that one of the main challenges of retail environmental smartification will be the difficulty in adjusting to the new smart model. However, as indicated by Business Intelligence & Strategy Director of AB Vassilopoulos supermarkets the company knows that people visit AB Vassilopoulos stores to shop and relax, and they don't want to be on top of a screen all the time while shopping. Therefore, AB Vassilopoulos is trying to smartify its stores' environment in a way that will maintain its customers' traditional shopping pattern, without becoming complex and creating adjustment problems.

Last but not least, many customers are worried that AB Vassilopoulos stores' smartification will lead to stuff reduction (64.9%) and lack of human interaction (33.1%). When it comes to such concerns Elias Symeonides suggested that AB Vassilopoulos will avoid the appearance of such phenomenons by creating a mixed relationship within the store where the digital world can coexist with the human factor, and they will be equally important.

4.3 AB Vassilopoulos stores smartification model

In order for the fourth and most important research question of the project to be answered, meaning “What is the most suitable smartification model for AB Vassilopoulos supermarket stores?” the customers preferences based on the research results have to be encapsulated in the creation of the final retail environmental smartification model.

Over 40% of the participants seem to have a preference on using smart scanning devices providing additional information about the store and its products and similar devices used as shopping assistants. As reported by Elias Symeonides “scanning and shopping assistant devices would be efficient for AB Vassilopoulos supermarkets as long as they wouldn’t make the customer be on top of a screen all the time.” In order to avoid confusing the customers, by providing them with different applications with similar functions and features the two applications will be combined. Customers who reported to use smart devices while shopping, also reported that they usually compare product prices, check the available discounts, make shopping lists and various notes and to calculate the total shopping cost using their smartphones.

On the bases of the aforementioned research results and the examples of certain applications that were presented in the literature review section the first proposed smart application will be available to customers using their own smart devices (smartphones or tablets) or similar devices provided optionally in the store’s entrance and other areas and will be used by consumers to create lists based on their product preferences and the available discounts, track their lists and their spending, locate products within the store, research products and recipes and check prices while shopping. Additionally, shoppers will be able to use these devices as electronic shopping assistants by scanning particular products or shelf labels to acquire information such as price per unit, production/expiration date, ingredients and origin of subcomponents, calories, origin, “green” information, the cheapest price of the same product in surrounding super markets, public health warnings regarding the product, alternatives for the product in the same shop, the country of origin and ratings of other consumers.

Based on Elias Symeonides statements AB Vassilopoulos has already installed smart paying devices in some of its supermarkets that pop up promotional messages referring to products that customers could purchase during their next visits. More specifically and based once more on the quantitative research results, 44% of the customers also reported that they would like for easy payment methods to be available such as using credit cards or product scanning. Therefore, when it comes to smart payment methods the proposed application will provide customers with the ability to automatically self scan their products and pay using either cash or their credit cards along with their AB plus card for further discounts. The existing data mining techniques already applied in AB Vassilopoulos stores, as suggested by the company's Business Intelligence & Strategy Director, will be used for gathering anonymous analytics regarding customer choices and popping up messages or sending notifications (email, SMS etc.) across multiple customers' devices using Bluetooth or WiFi, while they exit the supermarket. These promotional messages will refer to various discounts or products that the customer can check out online or during his next visit. Furthermore, the shoppers will be provided with the ability to refuse getting those messages if they become annoying.

As far as customer feedback is concerned, over 30% of the respondents would like touch screens to be available in various store locations giving them the ability to evaluate the store's service and environment. Recent literature review evidence (Jayavardhana et al., 2015) indicate that smart stores can install such applications connected with the stores IoT network in order to retrieve simple, direct valuable knowledge about its customers' needs, complaints and desired type of shopping. Using these screens shoppers can express various concerns and problems that they have faced within the store while shopping regarding the staff behaviour and the overall service quality, product availability and prices, the store's environmental conditions etc. They will also be able to make suggestions for improvement. In that way, customers will feel more respected knowing that their needs and feelings are considered important by the store that they have selected for their shopping.

Both the Business Intelligence & Strategy Director of AB Vassilopoulos Company and the customers (27.1%) seem to believe that dynamic pricing is one of the most suitable systems that could be embedded for the smartification of AB Vassilopoulos supermarkets. The proposed dynamic pricing application will use various sensors to for gathering anonymous analytics regarding customer choices and shopping behaviour in real time, then analyze data about each customer, accurately predict what price the customer is willing to pay and adjust prices accordingly. In this way this smart real time pricing system will also offer various discounts to loyal customers or to those who intent to purchase a large number of products at once, while being are able to change prices based on algorithms that take into account competitor pricing, supply and demand, customer's location, the time of day, the day of the week, and other external factors in the market.

Window displays are equally important to the stores interior, because they are the first impression of the store for everyone who walks by a store and they it can affect its choice about getting in the store or not. Based on quantitative research results AB Vassilopoulos customers would prefer for the shopping windows to be more interactive. Elias Symeonides provided a similar viewpoint suggesting that interactive window displays could be very appealing to customers, while replacing paper with more digital elements. Taking into consideration the preferences and opinion of both company and customers the proposed interactive window displays application will include digital mirrors that will allow shoppers strike poses and recommend various products and gigantic digital screens that will display discounts and promotional messages about various products. Since, as indicated by recent literature evidence (Sideri, 2014), AB Vassilopoulos is focusing on the promotion of Greek traditional products and launching its own private label Greek product line those digital screens can combine of audio narration, animations, interactive exercises, videos, text and graphics for promoting the locally grown, healthy, high quality products available in its stores.

As far as environmental cues that can have a potential effect on customers' shopping behaviour is concerned, the proposed smart application will use sensors creating a monitoring system that can detect customers' presence and collect information regarding their mood and body state, meaning the temperature, their pulses etc. Then the data gathered will be used for selecting the appropriate type of music or emitting specific odors (e.g. freshly baked bread) that will create a multi-sensory experience, make customers more enthusiastic and increase their desire for shopping. This application will also be able to automatically control equipment like air conditioners and lighting adapting the store environment's heating and lighting conditions to the current outdoor weather conditions, the customers' average temperature, and the time of the day creating a pleasant environment. Over 20% of the customers reported that they would like such applications to be available, combined with energy- saving techniques.

Such techniques are already implemented AB Vassilopoulos Green stores since 2010 as indicated by the company's corporate responsibility report for 2010 (AB Vasilipoulos, 2011). A more detailed position by Elias Symeonydes indicates that there are similar smart systems used on a daily basis in every AB Vassilopoulos store, aiming at reducing energy consumption. These smart systems include movement, heating and light sensors, photovoltaic systems and wind turbines to produce electricity, solar tubes for natural lighting, energy-saving systems for fridges etc.

When it comes to interactive digital screens popping up conversation bubbles as soon as customers pass by various products, 19.9% of the customers that participated in the survey conducted believe that this application should be included in AB Vassilopoulos environmental smartification model, while Elias Symeonides reported that such an application would be really effective for the stores overall promotional strategy. The proposed application will include conversation bubbles popping up on the wall as soon as customers pass by certain products providing information such as price, ingredients, calories, origin, and relevant recipes presented by popular chefs. Such bubbles, videos, and other similar digital tools will create an in- store interactive strategy that could also be used for attracting customers to various store areas with less popular products or products that the store wants to promote in a particular time period.

Less than 15% of the customers reported that they would use interactive touch screens allowing shopping before or without getting in the store. Though instead of such screens being located in the stores' entrance, a new supermarket type could be designed (e.g. new AB Vassilopoulos "On the Go" stores) in the form of shopping kiosks with touch screens working as vending machines, allowing customers to order products in place, fast in a more interactive way without getting in or walking around in the store.

Since only 10.9% of the participants seem to prefer applications with interactive directional signage within the store, confusing messages such as beeping or flashing will be replaced by the, previously mentioned, smart scanning devices , that can also navigate customers just by typing the address of the store they are in and the product name or category that they are interested in.

Last but not least, less than 10% of the customers reported that they would like to use virtual reality tools or wearable technologies while shopping. Literature review findings (Williams and Ackerman, 2011), have also suggested that letting customers physically holding products can create a sense of psychological ownership, driving must-have purchase decisions. Additionally, another interesting insight was produced via the interview process of the AB Vassilopoulos Business Intelligence & Strategy Director who stressed that wearable technologies combined with virtual reality could used mainly for online shopping. Based on the aforementioned research evidence, wearable technologies and virtual reality could be used by customers for shopping using the AB Vassilopoulos online platform, promoted using in- store advertizing campaigns, since the combination of e-commerce with in-store shopping is another of multi- sensory strategy application that is supported (Manyika et al., 2013) to generate a consistent retail experience.

The following Figures (Figure 10, Figure 11, Figure 12) presents the AB Vassilopoulos supermarkets smartification model that includes all the aforementioned smart applications that can be implemented for creating a superior multi-sensory consumption experience, while facilitating the company to become a part of the new generation businesses of the future.

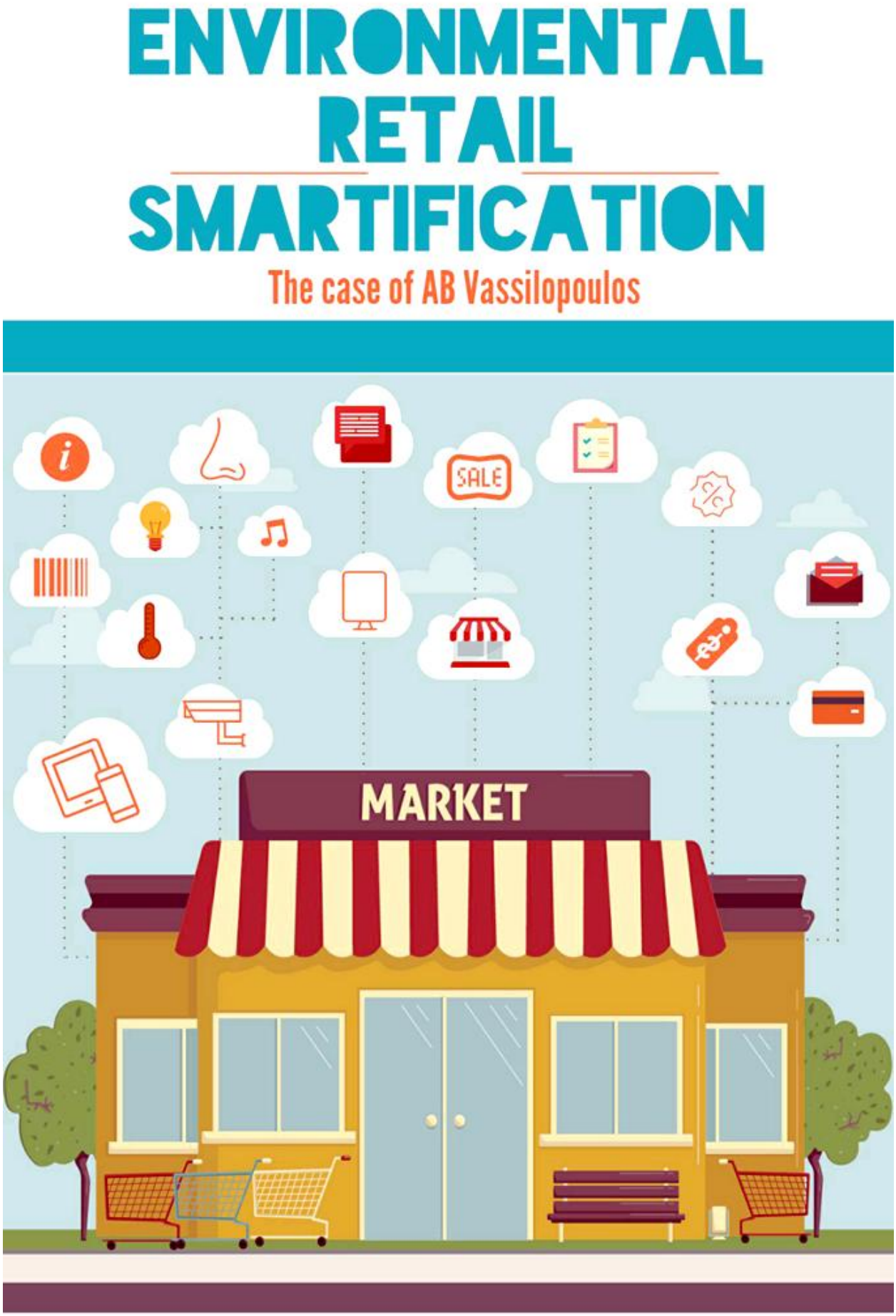

Figure 10. AB Vassilopoulos stores smartification model (1/3)

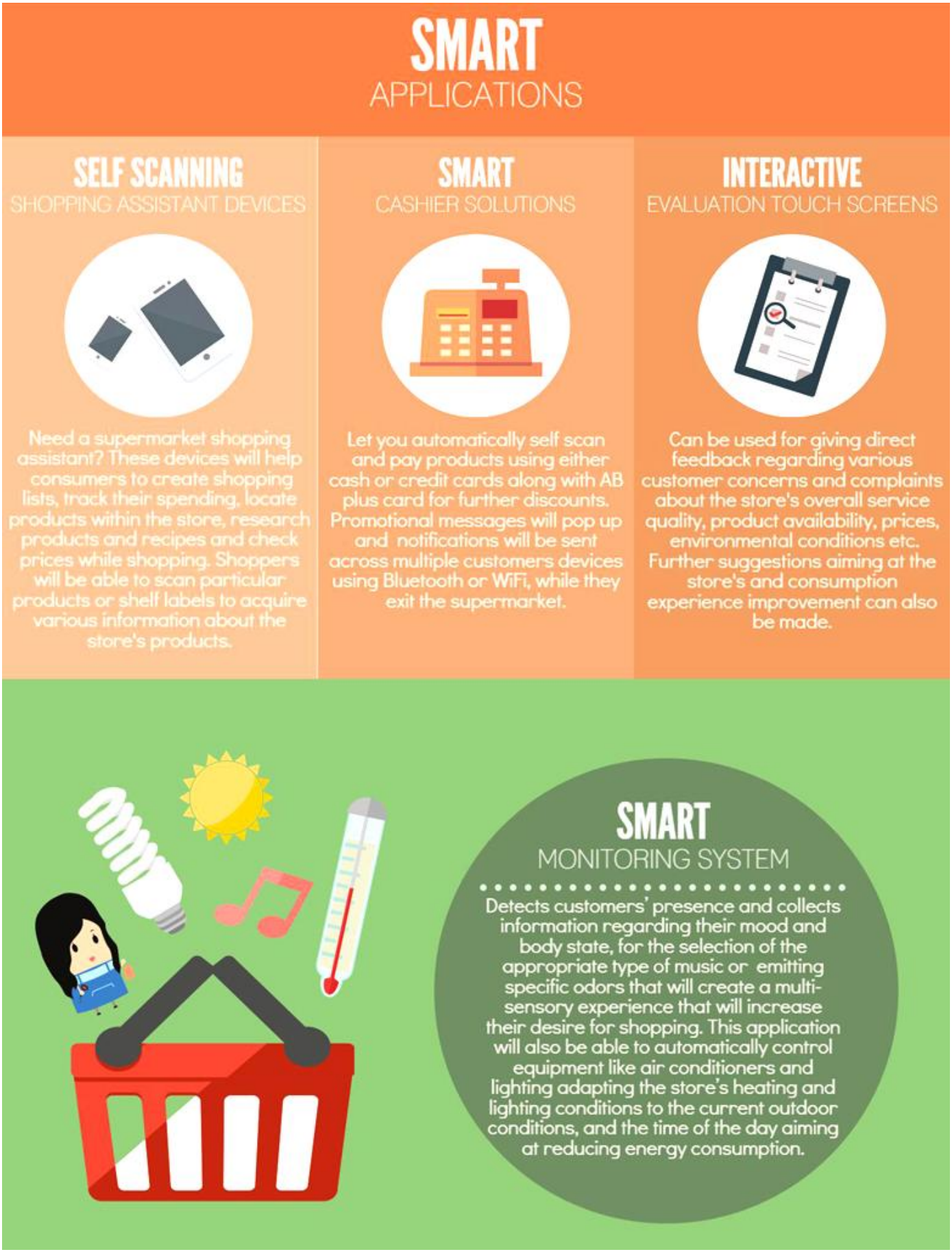

Figure 11. AB Vassilopoulos stores smartification model (2/3)

Figure 12. AB Vassilopoulos stores smartification model (3/3)

Chapter 5- Conclusions

The present dissertation aimed at creating a retail environmental smartification model for AB Vassilopoulos supermarkets through the exploration and investigation of the consumers' preferences and perception regarding retail smartification and the study's main research questions concerning the existence of need for smartifying AB Vassilopoulos supermarkets, the way that this smartification will change the overall shopping experience and the challenges and opportunities deriving by the smartification.

In this context, the finding of the research indicated that there is a need towards AB Vassilopoulos supermarkets environmental smartification. More specifically the AB Vassilopoulos customers expect from the company's stores to provide them with more smart solutions, since the supermarket chain has already made many steps towards retail environmental smartification.

Based on the findings of the quantitative and qualitative research, certain conclusions arise in relation to the way that the overall shopping experience will change after a smartifying AB Vassilopoulos stores using smart applications. The creation of a more pleasant, interactive and more entertaining shopping environment is found to be a major change in the traditional shopping pattern. Easier and quicker shopping, in a more comfortable and effective way are also considered important changes that will lead to more engaged and loyal customers and will facilitate the generation of a superior, consistent retail experience.

Furthermore, four basic opportunities have been revealed based on the primary and secondary research results related both to customers and the AB Vassilopoulos company. Enhancing the overall shopping experience, allowing them to shop easier, faster in a more effective and organized way, while saving money has proven to be a great opportunity for AB Vassilopoulos customers, providing them with a better quality of life. Increasing customers' satisfaction, engagement, and entertainment, allowing them to express their feelings by giving direct feedback about the store's service and environment and by creating a unique shopping experience based on their preferences is also considered a great opportunity both for AB Vassilopoulos and its customers.

Smartifying AB Vassilopoulos' environment could also lead to the creation of a positive, upper- level customer-store relationship that would facilitate its stores to acquire more loyal customers and retrieve valuable knowledge about their shopping behavior and preferences. Based on this knowledge, the company will be able to implement a more effective promotional strategy and create a pleasant environment based on customers' preferences increasing their average shopping time and intention to purchase.

The most important challenge of AB Vassilopoulos stores environmental smartification seems to be related with customers'security and privacy concerns. Difficulty in adjusting to the new smart retail environment also seems to be considered as a major challenge for AB Vassilopoulos customers, and especially to older people. Another customer concern may derive from the potential lack of human interaction, meaning that the whole shopping experience will become more digital leading to stuff reduction and less stuff– customers or customer- customer interaction. However, being aware of the aforementioned customer concerns, the company reassures its customers, via its Business Intelligence & Strategy Director statement, that its future smart stores will maintain a secure customer- centric environment, where the digital world can coexist with the human factor based on the traditional shopping patterns.

Eventually, all these finding regarding the need for AB Vassilopoulos stores environmental smartification, the future shopping experience, the possible challenges and opportunities deriving by the retail environmental smartification and customers' product preferences on smart applications were combined for the creation of the AB Vassilopoulos stores smartification model.

On the basis of the provided conclusions in combination with the study's methodological limitations certain challenges have derived concerning the development of the present study. One of the most significant and determining factors throughout the research conduction has been the element of time. Naturally, each and every aspect of the current research project has been negatively affected by this limitation from the conduction mixed methods, since qualitative and quantitative data collection procedure was compressed in order to proceed with the data analysis procedure within two months, to the very writing process of the overall project.

The time perspective has also influenced the data collection process in relation to low response rate though this limitation has been mainly affected by the participants' behaviour. More concretely, trust and refusal issues were emerged since the majority of the approached customers while shopping in various AB Vassilopoulos supermarkets presented unwilling behaviour towards a potential participation in a survey, therefore the questionnaires were also distributed electronically. In addition Greek language provided also a limitation to the study which has been related to the available time period as far as the semi structured interviews were concerned since the translation of the collected data required greater time investment.

The discussion regarding limitations, weaknesses, and conclusions of the present study could offer opportunities for further research towards retail environmental smartification. Thus, a future research may be developed in the subject of retail environmental smartification of Greek supermarkets focusing on the conduction of a quantitative study that shall involve a greater number of various Greek supermarket chains customers and not just AB Vassilopoulos stores customers. Furthermore, more light should be shed into the usage of specific technologies for the retail environmental smartification, including NFC, RFID etc. Last but not least, studying the combination of e-commerce with in-store shopping or the design of a new supermarket type that could allow customers to shop fast in a more interactive way using a single screen without getting in the store could lead to the generation of a superior, multi- sensory, consistent retail experience for every customer.

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Appendices

Appendix A

An Interview with Elias Symeonides, Business Intelligence & Strategy Director of AB Vassilopoulos Supermarkets

1.Are there any efforts or future plans towards store smartification in AB Vassilopoulos supermarkets?

AB Vassilopoulos already has a well organized clustering and segmentation system, using advanced technologies that can capture customers' behavior. Furthermore, efforts have been made towards merchandizing and navigation through the stores by installing information kiosks. Furthermore, smart automated paying devices have been installed in various AB Vassiloupos stores for data mining that can be used to pop up promotional messages depending on the customer's product preferences. Also, Ab Vassilopoulos tries to keep up with shopping trends by launching an application that allows customers to create a shopping list based on the existing discounts.

Low there have been some equally important low tech efforts, such as smart product organization based on customer preferences and placing promotional posters and displays in a way that will draw customers' attention.

Last but not least there are other supply chain smart applications, such as fully automated replenish systems that may not be visible to customers, but they provide the stuff with more time for customer service.

2.Do you believe that consumers will maintain a positive attitude towards smart applications in AB Vassilopoulos supermarkets?

After those steps towards store environmental smartification, our customers are more than ready and they expect from us to provide them with more smart shopping solutions.

3.In what way will the AB Vassilopoulos stores smartification change the overall shopping experience?

Smart applications will definitely lead to an upper level positive customer- store relationship. This new relationship, will also include the element of surprise for the customer, though there is a traditional shopping pattern that cannot and shouldn't change. Customers visit our stores to shop and relax, therefore and based on the fact that our stores have to do with traditional food retailing, everything cannot be digital. The customer doesn't want to be on top of a screen all the time while shopping. So far no supermarket chain has reached the stage of fully personalized sales and we cannot be sure if fully personalized shopping will totally address customers' needs. In the future a new non-record type of store may appear that will allow customers to come and go while maintaining their anonymity and their behavior remains unobserved.

4.Have you noticed any differences in the customers usage of smart devices during shopping?

Our customers are using smart devices more than before, but not on such a high level.

5. In your opinion what are the main store smartification challenges and opportunities both for the customers and AB Vassilopoulos supermarket chain?

By installing all those smart systems AB Vassilopoulos will lead to better more effective targeting create a more intimate relationship with the customers. Actually, there will be probably more regular base, loyal customers. Though, I don't think that there are and challenges for AB Vassilopoulos, because the brand recognized the high importance of personal data for the customers, and they cannot be assured that there won't be any leak or privacy issues.

When it comes to customers they will have a fully defined relationship with our stores and will be able to shop easily in a more pleasant and interactive way, control their budget, organize their shopping in a better way and generally have a better quality of life. Many consumers are afraid of having a digital relationship with the supermarket that choose to visit for their shopping, though this can be avoided by creating a mixed relationship by the store where the digital world can coexist with the human factor, and that is exactly what AB Vassilopoulos stores are trying to accomplish.

6.Which of the following smart applications would you like to be available in AB Vassilopoulos and why?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

Scanning and shopping assistant devices would be efficient as long as they wouldn't make the customer to be on top of a screen all the time. Dynamic pricing is also something that could work well in AB Vassilopoulos stores. Our customer, targeting and segmentation is already based on observing customers behaviour, therefore the element of locality, meaning forming every store in a way that it can address local customers' needs, is really important for AB Vassilopoulos supermarkets. Automatic messages would also be effective, while combined with sending promotional messages (SMS) to customers using Bluetooth or WiFi. A smart watch could be used by a customer for many reasons while shopping, while Google glasses combined with virtual reality could be used mainly for online shopping. Interactive shopping windows could be very appealing and I like the idea of replacing paper with more digital elements. Smart payment methods are already applied. Last but not least, there are advanced methods that are applied in daily basis and not only in our Green Stores, aiming at reducing energy consumption.

Customer interviews

Interview 1

1. How often are you visiting AB Vassilopoulos supermarkets?

Once every week.

2. What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

They are well organized, with pleasant environment and they provide big discounts.

3. Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes very much.

4 Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes, though some stores lack of staff.

5. The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. I like this application because it can help me shop fast and navigate me, though it could lead to firing staff.

c. I would like this application to exist in AB Vassilopoulos supermarkets in order to be able to compare product prices and get product recommendations
f. Yes, it would help me shop fast and easy
g. It would improve the supermarket's environment along with my shopping experience.
l. Yes, though I am not sure if such systems would be reliable.
m. I would feel like getting an award for being loyal
n. Yes, I am environmentally conscious

6. Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
Yes

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
Faster shopping, shopping expenses reduction, personalized sales

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
No

9. In what way do you believe that these smart applications will change the customers shopping experience?
It would become more pleasant, and interactive, but more complex too.

10. Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Customers could save time and money and buy more quality products.

11. Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
These applications could easily lead to overconsumption and they could be difficult to use for some people. Also, I think that there are many privacy issues.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
No

Respondent's Profile: Female, 25 years old, from Lamia. Single, University graduate, Annual household income between 25.000- 34.000 Euros

Interview 2

1. How often are you visiting AB Vassilopoulos supermarkets?

Once every month.

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

Pleasant environment and product variety.

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes, the staff is very friendly.

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. I like this application because it can help me shop fast and show me any available discounts.

c. Yes, but I would combine its usage with walking around the store.

d. Yes, I would like to scan my products, get information about ingredients, and in the end get a notification about the total cost of my products.
e. I would like this application especially if it provides information regarding discounts
j. Yes, it could be so appealing that I could make me buy something I didn't need.
k. It would upgrade my shopping experience.
l. Yes, I can pay without waiting in the line.
m. I like it and it would definitely make me visit the store again.
n. Yes, I am environmentally conscious

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
Yes

7. What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
Mainly upgrading the shopping experience.

8. Are there currently any similar applications in AB Vassilopoulos supermarkets?
Just the barcode scanner.

9. In what way do you believe that these smart applications will change the customers shopping experience?
The consumer becomes the centre of attention. These applications help him shop faster and spend less, while keeping him entertained. Shopping becomes a game for the customer.

10. Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Shopping becomes entertaining, while customers can save time and control the money they spend in a better way.

11. Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
This level of automation could lead to lack of human interaction. There are also many privacy issues.

12. Are you using smart devices (smart phones, tablets) during shopping? In what way?
No

Respondent's Profile: Female, 29 years old, from Thessaloniki. Single, Designer, monthly income 1.000 Euros

Interview 3

1. How often are you visiting AB Vassilopoulos supermarkets?

Once every week.

2. What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

Pleasant environment and excellent service.

3. Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. I like this application because it can help me shop fast when it's needed.

c. Yes, but I would only use it for new products.

d. Yes, I would again use it for new products.

f. It could save me time.

i. Yes, it would be really interactive.
j. Yes, it could attract many customers.
k. If I felt comfortable, I would probably spend more time in the supermarket.
l. Yes, I can pay without waiting in the line.
m. Yes, I would visit the store more often and feel really important.
n. Yes, I consider myself a green consumer.
6. Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
Yes

7. What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
Mainly upgrading the shopping experience and entertain customers.

8. Are there currently any similar applications in AB Vassilopoulos supermarkets?
No.

9. In what way do you believe that these smart applications will change the customers shopping experience?
Customers could shop faster and easier and be more relaxed. Also they would fell more respected.

10. Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Shopping becomes entertaining. These applications are time saving

11. Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
Some people, like the elderly, could find it difficult to use these new technologies.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
No

Respondent's Profile: Male, 35 years old, from Thessaloniki. Married, Engineer, monthly income 1.800 Euros

Interview 4

1.How often are you visiting AB Vassilopoulos supermarkets?

Once every week.

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

Pleasant environment and friendly staff.

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. Yes, it would save me time if I didn't know what to buy.
b. Yes, it could make recommendations about products that I would be interested in.

e. It could give me ideas and information about various products, and I consider it to be very appealing.
g. I would like to express my feelings about the store.
i. It would just make my day.
j. Yes, especially if it showed messages and discounts about products that I am interested in.
k. I like the personalization concept.
m. I It would make the loyal customers really happy.
n. Yes, I am environmentally conscious. This could also save money for the store.

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
Yes

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
Need for speed and entertainment.

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
Just the barcode scanner.

9.In what way do you believe that these smart applications will change the customers shopping experience?
Faster, easier, interactive, and personalized shopping. It could be confusing for some customers.

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Customers will be more relaxed, these applications can save them a lot of time and the shopping becomes easier.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
I am worried about the reliability of these systems especially when it comes to money and personal data. Also the usage of such technologies could be difficult to use by some customers.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
Yes, for comparing products and find various recipes.

Respondent's Profile: Male, 37 years old, from Athens. Married, Accountant, monthly income approximately 2.000 Euros

Interview 5

1.How often are you visiting AB Vassilopoulos supermarkets?

Twice a month.

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

Value for money, quality products.

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. Yes, really useful especially in big stores.

c. I would like it to be available using my smartphone, in order to avoid carrying an additional device.
g. I could express my dissatisfaction and it would also seem like an interactive game to me.
j. I like it more than a simple poster, I think it would attract many customers.
l. It would lead to faster and easier shopping.
m. It would make me feel appreciated, and save me money.
n. Yes, I am environmentally conscious. This could also make me go to the specific store more often.

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
Yes, though I think that they could be effective combined with well trained staff.

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
Saving time and money and entertainment.

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
Just the barcode scanner.

9.In what way do you believe that these smart applications will change the customers shopping experience?
Interactive, faster and relaxed shopping in a pleasant environment.

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Customers will be more relaxed, these applications can save them a lot of time and money.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
The usage of such applications could be difficult by some customers.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
No.

Respondent's Profile: Female, 24 years old, from Athens, Single, Physiotherapist, monthly income approximately 1.000 Euros

Interview 6

1.How often are you visiting AB Vassilopoulos supermarkets?

3-4 times per week

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

Clean environment, variety, good service, quality

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a.Yes especially if I didn't have enough time

b.Yes and I would also like it to remind me of some products that I am forgetting to buy
d.I would like it to make recommendations and compare prices
e.I would like to inform me about discounts
f. it would help me shop faster
g. Yes the store has to get feedback
h. in that way my hands could be free
i. Yes but I wouldn't want it to replace the human factor
k. Yes but it could be difficult to use for some customers
l. In this way you can control your budget and don't use any cash
N. This application could attract green customers I am one too

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
Yes the society is evolving and retailing has to evolve too.

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
Need for saving time and money and for more organized shopping.

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
Barcode scanner.

9.In what way do you believe that these smart applications will change the customers shopping experience?
The shopping experience will be more entertaining, faster and interactive, like a game.

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Customers will be saving a lot of time and money.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
The usage of such applications could be difficult by some customers, such as the elderly. They have to get trained to use these applications first. There may be some privacy issues.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
Yes, I use my smartphone to make shopping lists.

Respondent's Profile: Female, 29 years old, from Mitilini, Single, Agriculturists, monthly income approximately 1.200 Euros

Interview 7

1.How often are you visiting AB Vassilopoulos supermarkets?

3-4 times per week

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

Value for money.

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. yes only to order a product that doesn't exist
d.yes it will navigate me through the store

e.yes advertising should evolve using new technologies g.it would help both the store and the customers
j.it is interactive and would attract many customers
n.I like any energy-saving application

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
No, I don't believe that there is a need it just another kind of innovation

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
Time saving

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
Barcode scanner.

9.In what way do you believe that these smart applications will change the customers shopping experience?
Shopping would be more easy entertaining and customers would have more spare time

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Faster and more effective shopping

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
The shopping routine is changing and this may be proven difficult to some people. Also, I am concerned about where could this evolution lead.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
Yes, I search for specific products using my smartphone

Respondent's Profile: Male, 24 years old, from Alexandroupolis, Single, Pharmacist, monthly income approximately 800 Euros

Interview 8

1.How often are you visiting AB Vassilopoulos supermarkets?

Twice a month

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

They have reasonable prices and specific products that I am interested in

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive screens allowing shopping before or without getting in the store and ordering unavailable products
b. Customer behavior observation in order to predict their future needs
c. Smart devices used as shopping assistants
d. Smart scanning devices providing additional information about the store and its products.
e. Interactive screens showing messages with additional information about the product as soon as a customer passes by
f. Interactive navigation signs within the store
g. Interactive screens for store evaluation
h. Wearable technologies
i. Virtual reality
j. Interactive shopping windows
k. Customer behavior and statement observation in order to adjust the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. this would be fast if you're looking for specific products
d.personalized sales
f. fast and easy shopping, especially if there isn't somebody around to help you
g. giving feedback is good both for the store and the customers
j. Yes I prefer it from printed posters, it would save money for the store
l. Yes unless some bank coul take advantage of it
m. I would feel appreciated
n. I am a green customer

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
Yes

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
Saving time money and energy

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
No

9.In what way do you believe that these smart applications will change the customers shopping experience?
Customers would be more informed and a shop faster and save money.

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Shopping would be more interactive and entertaining.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
Shopping using this application could be a challenge for the elderly and people that are not used in these new technologies. Furthermore, such a heavy load of information provided while shopping could be too much.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
If I have a fixed budget, I use the calculator of my smart phone.

Respondent's Profile: Male, 27 years old, from Alexandroupolis, Single, Teacher, monthly income approximately 1200 Euros

Interview 9

1.How often are you visiting AB Vassilopoulos supermarkets?

Three or four times per week

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

Variety, Pleasant environment, well-organized.

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. yes but just for navigation

b.it allows me to shop faster and it can reveal some needs that I didn't even know I had

d. I would like the comparison of products
f. yes because sometimes I get lost
g. it helps both the customer and the supermarket
j. yes I find it appealing and then it could show you products that you are interested in
k. it would make me feel comfortable
l. I wouldn't have to wait in lines anymore
m. it will show me that I'm respected and I would definitely visit the store again
n. I like Automation and I'm environmentally conscious

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
Yes

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
Need for shopping fast and easily and generally run an easy life

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
No

9.In what way do you believe that these smart applications will change the customers shopping experience?
More interesting, faster and easier, while all these applications would be very helpful for people with disabilities.

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Quick transactions and more information about new products.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
Fear about new technologies. Some people feel that they're being watched. The elderly would not feel comfortable around these technologies.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
I use Google Kit to make notes and shopping lists.

Respondent's Profile: Male, 32 years old, from Thessaloniki, Single, Web Designer, monthly income approximately 1500 Euros

Interview 10

1.How often are you visiting AB Vassilopoulos supermarkets?

Once or twice a month

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

it's close to where I live, pleasant environment

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. yes it helps me shop fast and if there's a lot of people in the store I can shop before getting in it

g. The store would be improved and I would be pleased
l. I find this application really useful
n. Yes but I wouldn't want the lights to turn off

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
I don't think that there is a need

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
It would provide customers with comfortable and fast shopping, but it could also become complex and tiring

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
No

9.In what way do you believe that these smart applications will change the customers shopping experience?
These applications will ruin the shopping experience. There's going to be a lot of automation and people will stop talking to each other. Customers have a need for touch, so why use virtual reality?

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
As I said before shopping will be faster and more comfortable.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
I can see no point in using all these systems. It can be complex and there will be lack of human interaction and the lack of contact with the products.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
No

Respondent's Profile: Male, 25 years old, from Thessaloniki, Single, Musician, monthly income approximately 1900 Euros

Interview 11

1.How often are you visiting AB Vassilopoulos supermarkets?

Once or twice per week.

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

Variety, quality, value-for-money, reasonable prices discounts and it's close to where I live

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. Time and effort saving

c.-d. Customer shop fast and get more informed about the products
e. I believe that it would attract many customers
g. There's a chance for store improvement
l. It's easy, you save time, money and shopping becomes more relaxing
m. I would probably improve my mood
n. The store conditions would be improved, while saving energy

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
I don't think that there's a need, though these applications could make shopping easier.

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
Need for speed, time, information, and entertainment.

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
No

9.In what way do you believe that these smart applications will change the customers shopping experience?
Shopping in a supermarket will become more interactive and pleasant

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
AsI mentioned before it will be time and money saving and more entertaining.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
I don't want to be controlled I want my privacy I don't want to be wached or lose the interaction with other people

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
Yes I use my *smartphone's* calculator and sometimes I also seek for recipe ingredients online.

Respondent's Profile: Female, 28 years old, from Alexandroupolis, Single, Doctor, monthly income approximately 2100 Euros

Interview 12

1.How often are you visiting AB Vassilopoulos supermarkets?

Once a week

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

It's close to where I live.

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. It seems very practical

c. I would consider it useful

f. Yes sometimes it's hard to find a person to help me and I would like to use when I am in a hurry
g. The store could be informed about the existing products and get improved
l. Yes it would save me a lot of time
m. I want to save money and I would feel appreciated as a loyal customer
n. I am environmentally conscious

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
No

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
Just to save time

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
No

9.In what way do you believe that these smart applications will change the customers shopping experience?
It will become more interactive.

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Saving time and store improvement.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
Many people will be fired.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
No

Respondent's Profile: Fale, 29 years old, from Alexandroupolis, Single, Student, no monthly income of her own

Interview 13

1.How often are you visiting AB Vassilopoulos supermarkets?

Three or four times/week

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

It's close to where I live.

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a.I will find it very useful and it would help me shop faster

c. It would provide me with a lot of information regarding new and existing products

g. It would improve the store and I would be happy because my complaints would be taken into consideration
l. It's really fast and it already happens all around the world
m. I am a loyal customers and I would like for the supermarket to recognize me as one
n. I am a green customer

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
I don't think that there's a need.

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
These applications will save customer some time for sure.

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
No

9.In what way do you believe that these smart applications will change the customers shopping experience?
It would be more pleasant and interactive but for the elderly it would be just too complicated.

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Just as said before it will be really entertaining and interactive and it would attract many customers and help saving energy.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
Many people could get fired and it would be complicated for the elderly and they're also some privacy issues.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
No

Respondent's Profile: Female, 29 years old, from Thessaloniki, Single, Teacher, monthly income approximately 1200 Euros

Interview 14

1.How often are you visiting AB Vassilopoulos supermarkets?

Yes twice a month.

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

They have specific products that I am interested in

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. it would save me time and effort

c. Yes but I would also like you to compare prices of other supermarkets' products.

g. Yes sometimes I have lots of complaints and I can't express them
i. Yes I would like it especially when it refers to recipes
k. I find this application really amusing it would improve my mood
m.It would show appreciation
n. I like every application that has to do with saving the environment

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
Yes

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
I would be more informed about discounts and products and I wouldn't have to wait a long time to pay.

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
No

9.In what way do you believe that these smart applications will change the customers shopping experience?
Shopping would be faster and more interactive and amusing.

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Shopping can become more amusing but only if you have enough time to spend in the store in order to use all these applications.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
Lack of human interaction, while lots of people could be fired.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
No

Respondent's Profile: Female, 22 years old, from Serres, Single, Student, no monthly income of her own

Interview 15

1.How often are you visiting AB Vassilopoulos supermarkets?

Twice a month

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

My friends go there and I go with them.

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. Yes it's very useful you don't get lost and you save time

c. It sounds really practical

d. It would be very useful because I usually don't remember previous prices or information about the product
g. I would like to have a chance to express my complaints
l. Fast shopping
m. I don't feel like getting an award for shopping
n. I would like anything that would help saving energy

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
Yes

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
I think that there is a need for speed and saving money, but I wouldn't like for the traditional shopping experience to get lost.

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
No

9.In what way do you believe that these smart applications will change the customers shopping experience?
It would become amusing and interactive.

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Customers could save time money and effort and they would be more entertaining.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
Some people could get confused, some people will get fired and there wouldn't be any communication between customers and the staff.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
No

Respondent's Profile: Female, 24 years old, from Kozani, Single, Student, no personal income

Interview 16

1.How often are you visiting AB Vassilopoulos supermarkets?

3 times a week.

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

Product variety.

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes.

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. It would save me lots of time

c. Yes I could get information about the discounts prices and the quality of the products
f. I get lost many times
k. It would improve my mood
l. Fast and easy shopping
m. Yes because I buy specific products
n. Yes I want to help save the environment

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
Yes

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
Need for saving time.

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
Bar code scanner.

9.In what way do you believe that these smart applications will change the customers shopping experience?
Customers will shop faster and be more informed.

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
These applications can save customers time and money.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
People will get fired.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
Yes, I use the calculator on my smartphone.

Respondent's Profile: Female, 28 years old, from Ioannina, Single, Teacher, monthly income approximately 1500 Euros

Interview 17

1.How often are you visiting AB Vassilopoulos supermarkets?

Yes twice a month.

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

It's close to where I live.

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

c. Specific customer needs will be addressed

d. Easy shopping

f. Yes especially if you get in the store from the first time
l. I don't have to wait the line
m. I would feel respected
n. The best of all the above applications

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
No

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
People will think that they will be entertained, but they will get confused in the end.

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
No.

9.In what way do you believe that these smart applications will change the customers shopping experience?
Maybe faster shopping.

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Just shop faster.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
These applications will make customers stupid and they will confuse them.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
No

Respondent's Profile: Female, 35 years old, from Orestiada, Married, Agriculturist, monthly income approximately 1800 Euros

Interview 18

1.How often are you visiting AB Vassilopoulos supermarkets?

Once a week.

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

Pleasant environment.

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

c. Easy shopping

f. In stores that you haven' t visited before

l. It would save me lots of time
m. I would save time and feel unique
n. The refrigerators should stop functioning automatically when they reached a specific temperature.

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
No

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
I don't think that there is a need.

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
No

9.In what way do you believe that these smart applications will change the customers shopping experience?
Maybe faster shopping. More difficult, confusing.

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Faster shopping.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
Customers won't think anymore, non practical applications.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
No

Respondent's Profile: Male, 34 years old, from Naousa, Married, Taxidriver, monthly income approximately 1200 Euros

Interview 19

1.How often are you *visiting* AB Vassilopoulos supermarkets?

3 times/ week.

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

Close to where I live, Product Variety, Quality, Pleasant Environment.

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. It will be really useful, if a customer doesn't have enough time to spend in the store.

c. Time saving

d. It can provide customers with valuable information.
e. Appealing and informative.
g. I can express my complaints.
i. Interactive and amusing, but a little bit complicated, too.
j. Appealing, amusing.
k. Store is adjusting to my needs.
l. No waiting time.
m. I will feel appreciated.
n. I consider myself a green customer.

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
Yes

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
Entertainment, Interaction, Fast shopping.

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
No

9.In what way do you believe that these smart applications will change the customers shopping experience?
The shopping experience will become, easier, interactive and generally more pleasant.

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Customers will shop faster, be more informed, and spend more time in the store, since they will be entertained.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
Older people may be confused, and people may buy products that they didn' t need.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
No

Respondent's Profile: Female, 24 years old, from Alexandroupolis, Single, Marketing Assistant, monthly income approximately 1000 Euros

Interview 20

1.How often are you visiting AB Vassilopoulos supermarkets?

Approximately 2 times a week.

2.What are the main reasons that motivate you to visit AB Vassilopoulos supermarkets?

Close to where I live, Product Variety, Quality, Pleasant Environment.

3.Are you satisfied with the AB Vassilopoulos supermarkets' environment? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

4.Are you satisfied with the AB Vassilopoulos supermarkets' service? If not, why? Do you have any further recommendations that would improve your shopping experience?

Yes

5.The most popular smart applications for the smartification of a supermarket are presented below. Which of these systems would you like to be installed in AB Vassilopoulos supermarkets and why? Do you have any further recommendations that would improve your shopping experience?

a. Interactive touch screens allowing ordering products in place without getting in the store
b. Customer behavior observation in order to predict their future needs
c. Smart shopping assistant devices
d. Smart self product scanning devices
e. Conversation bubbles popped up soon as a customer passes by various products
f. Interactive directional signage
g. Interactive store evaluation touch screens
h. Wearable technologies
i. Virtual reality
j. Interactive window displays
k. Customer behavior and body state observation for adjusting the stores' conditions
l. Easy payments using credit cards or product scanning
m. Dynamic pricing
n. Adjusting the store conditions in order to decrease energy consumption

a. It will be really useful, if a customer doesn't have enough time to spend in the store.

c. Time saving
d. It can provide customers with valuable information.
e. Appealing and informative.
g. I can express my complaints.
i. Interactive and amusing, but a little bit complicated, too.
j. Appealing, amusing.
k. Store is adjusting to my needs.
l. No waiting time.
m. I will feel appreciated.
n. I consider myself a green customer.

6.Do you feel that there is a need for applying such systems in AB Vassilopoulos supermarkets?
Yes

7.What kind of needs could in your opinion be addressed by installing such smart applications in AB Vassilopoulos supermarkets?
Fast shopping, more pleasant shopping environment.

8.Are there currently any similar applications in AB Vassilopoulos supermarkets?
No

9.In what way do you believe that these smart applications will change the customers shopping experience?
It will become more interactive, pleasant effective and fast.

10.Do you believe that there are currently any opportunities deriving by installing smart applications in AB Vassilopoulos supermarkets?
Customers will be more entertained, save time and money and feel respected, since they will be given the ability to express their feelings.

11.Do you believe that there are currently any challenges deriving by installing smart applications in AB Vassilopoulos supermarkets?
Older people may become confused and people will get fired.

12.Are you using smart devices (smart phones, tablets) during shopping? In what way?
No

Respondent's Profile: Male,50 years old, from Chania, Married, Engineer, monthly income approximately 1900 Euros

Appendix B

Questionnaire sample

Survey on AB Vassilopoulos consumers in order to acquire knowledge related the smartification of AB Vassilopoulos supermarkets

The following questionnaire is a part of a research project for the Msc program in Strategic Product Design of International Hellenic University. The objective of the questionnaire is to collect information regarding the smartification of AB Vassilopoulos supermarkets. The approximate completion time for this questionnaire is 10 minutes.

The information you provide will be treated in the strictest confidence. You will notice that you are not asked to include your name or address anywhere on the questionnaire.

- ***Questions regarding AB Vassilopoulos supermarket experience***

1. How often are you visiting AB Vassilopoulos supermarkets?

□ >3 times/week
□ 1-3 times/week
□ 2 times/month
□ 1 time/month
□ <1 time/month

2. For what reasons are you visiting AB Vassilopoulos supermarkets?

□ Convenient location
□ Product variety
□ Product quality
□ Reasonable prices
□ Discounts
□ Pleasant environment
□ Excellent service
□ Other _____

3.Is there anything that you don't like in AB Vassilopoulos supermarkets?

□ Yes _____*

□ No

- ***Questions regarding smart applications***

4.Are you using any smart devices (smartphones, tablets) while shopping?

□ Yes

□ No

5.If yes, in what way?

_____

_____

_____

6.Which of the following applications would you like to be available in AB Vassilopoulos supermarkets?

□ Interactive touch screens allowing ordering products in place without getting in the store

□ Customer behavior observation in order to predict their future needs

□ Smart shopping assistant devices

□ Smart self product scanning devices

□ Conversation bubbles popped up soon as a customer passes by various products

□ Interactive directional signage

□ Interactive store evaluation touch screens

□ Wearable technologies

□ Virtual reality

□ Interactive window displays

□ Customer behaviour and body state observation for adjusting the stores' conditions

□ Easy payments using credit cards or product scanning

□ Dynamic pricing

□ Adjusting the store conditions in order to decrease energy

6.Do you believe that there is a need for smartifying AB Vassilopoulos supermarkets?

□ Yes

□ No

7.By smartifying AB Vassilopoulos supermarkets the shopping experience will become:

□ Interactive
□ Pleasant
□ Comfortable
□ Impersonal
□ Easy
□ Complex
□ Unreliable
□ Personalized
□ Effective
□ Other _____

8.What are the opportunities of smartifying AB Vassilopoulos supermarkets?

□ Faster shopping
□ Faster shopping
□ More informed customers
□ Organized shopping
□ Saving money
□ Pleasant environment
□ Personalized sales
□ Customers' loyalty appreciation
□ Increasing customers' satisfaction
□ Learning about customers; problems and complaints
□ Other _____

9.What are the challenges of smartifying AB Vassilopoulos supermarkets?

□ Overconsumption
□Privacy issues
□ Fear of using advanced technologies
□ Lack of human interaction
□ Firing stuff
□ Automated shopping experience
□ Less amusing shopping experience
( ) Other _____

- ***Demographic questions***

10.Age: _____

11.What is your gender:
□ Male
□ Female

12.What is your marital status?

□ Married

□ Single

□ Divorced

□ Widowed

13.What is the highest level of education you have completed?

□ Some high school

□ High school graduate

□ Some college

□ Trade/ technical/vocational training

□ College graduate

□ Some post graduate work

□ Post graduate degree

14.What is your monthly personal income?

□ 0-499 euros

□ 499-1000 euros

□ 1001-1500 euros

□ 1501-2000 euros

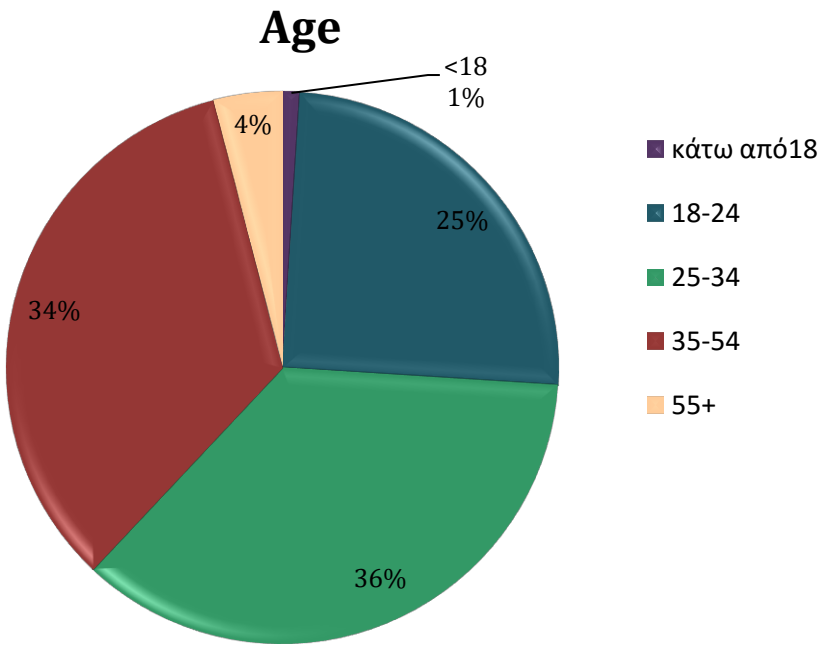
□ 2001- 2500 euros

□ > 2501 euros

Thank you very much for your time!

Appendix B

Quantitative analysis results- Descriptive statistics

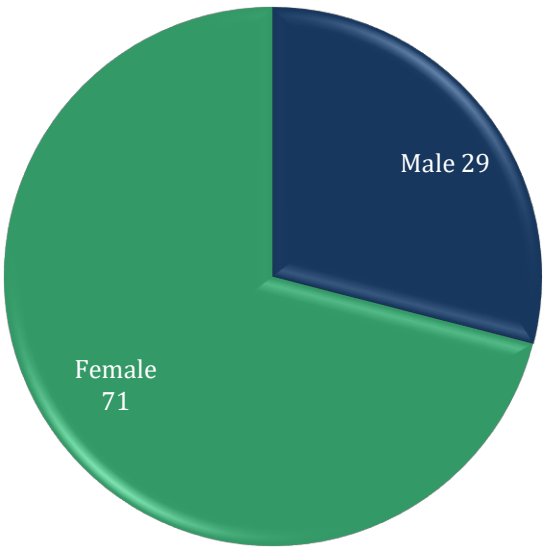


Value	Percent	Count
<18	0.6%	5
18-24	25.5%	198
25-34	35.8%	278
35-54	34.2%	266
55+	3.9%	30
Total		777

Statistics

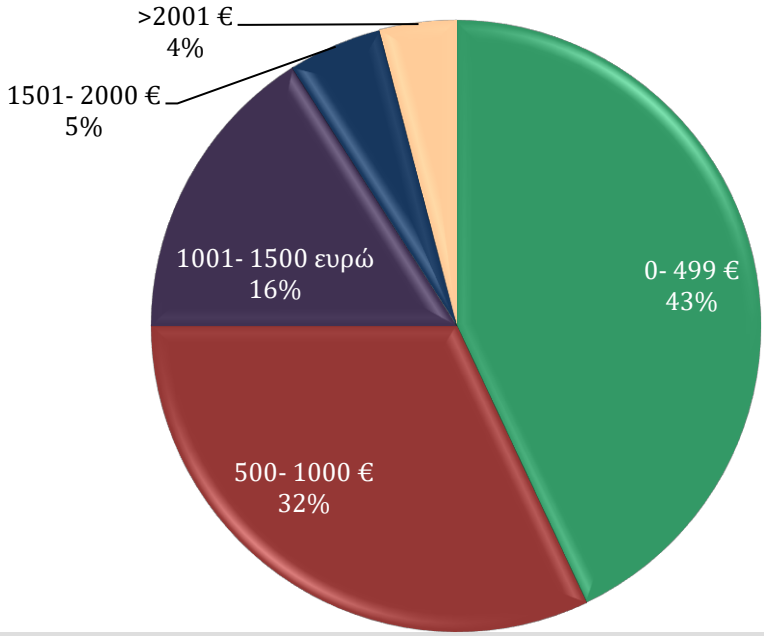
Sum	21,474.0
Average	27.8
StdDev	8.6
Max	55.0

Sex



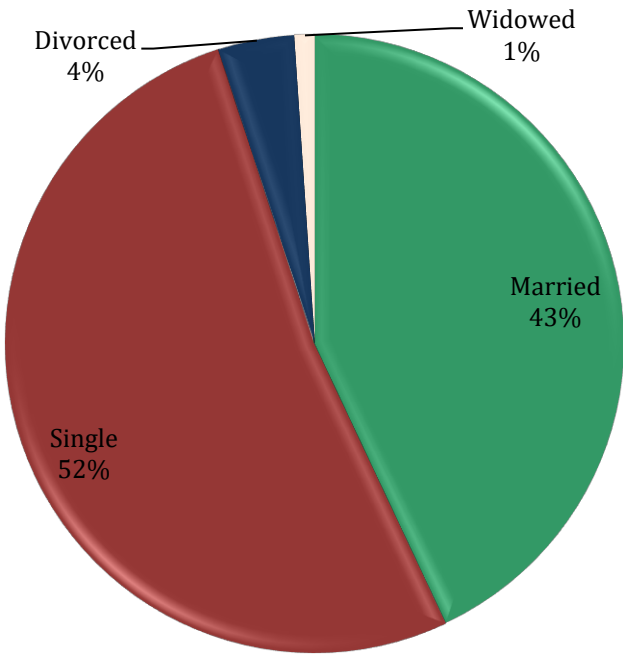
Value	Percent	Count
Male	28.7%	222
Female	71.3%	552
Total		774

Personal monthly income

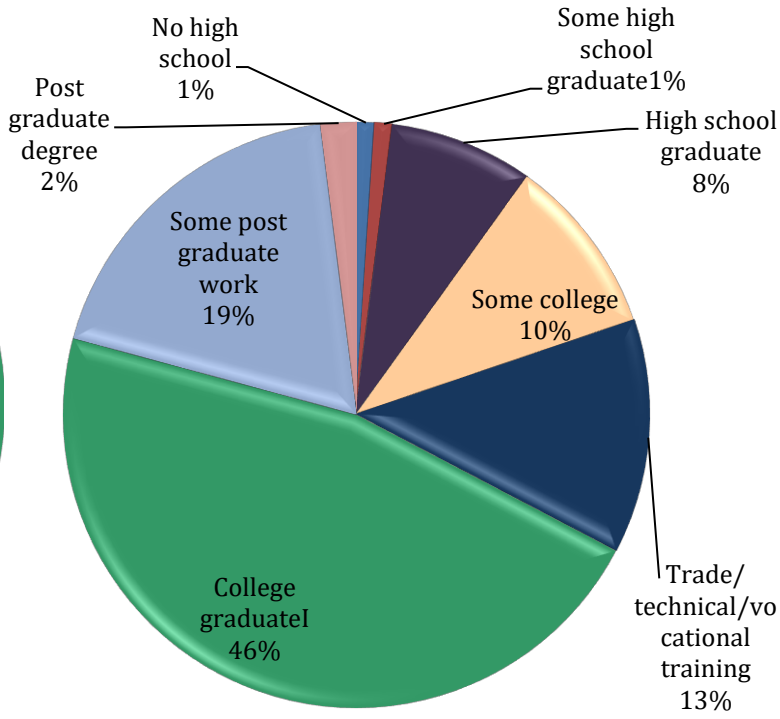


Value	Percent	Count
0- 499 €	43.3%	330
500- 1000 €	32.0%	244
1001- 1500 €	15.6%	119
1501- 2000 €	5.3%	40
>2001 €	3.8%	29
Total		762

Marital status



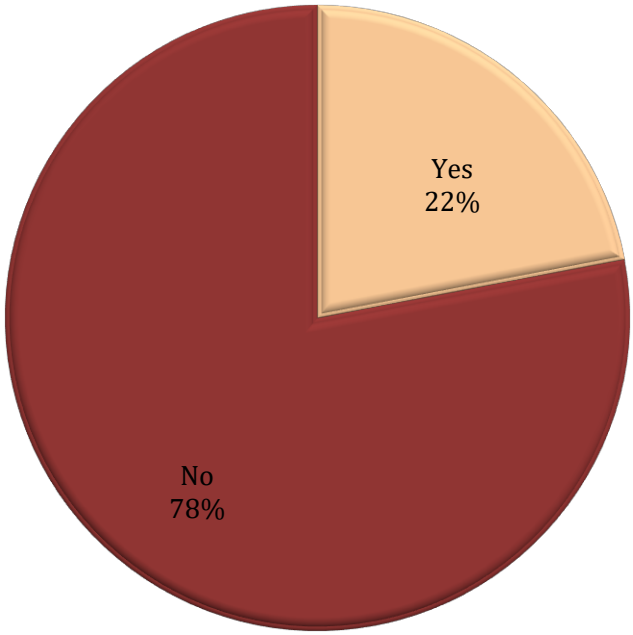
Educational Status



Value	Percent	Count
Married	43.0%	331
Single	51.6%	397
Divorced	4.4%	34
Widowed	0.9%	7

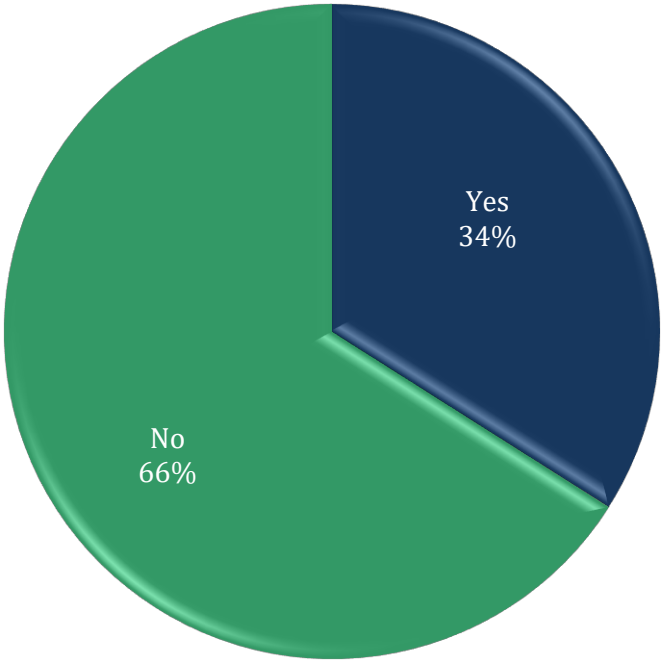
Value	Percent	Count
No high school	0.7%	5
Some high school	0.8%	6
High school graduate	8.4%	65
Some college	9.7%	75
Trade/ technical/vocational training	12.8%	99
College graduate	47.4%	366
Some post graduate work	18.7%	144
Post graduate degree	1.6%	12

Is there anything that you don't like in AB Vassilopoulos supermarkets?



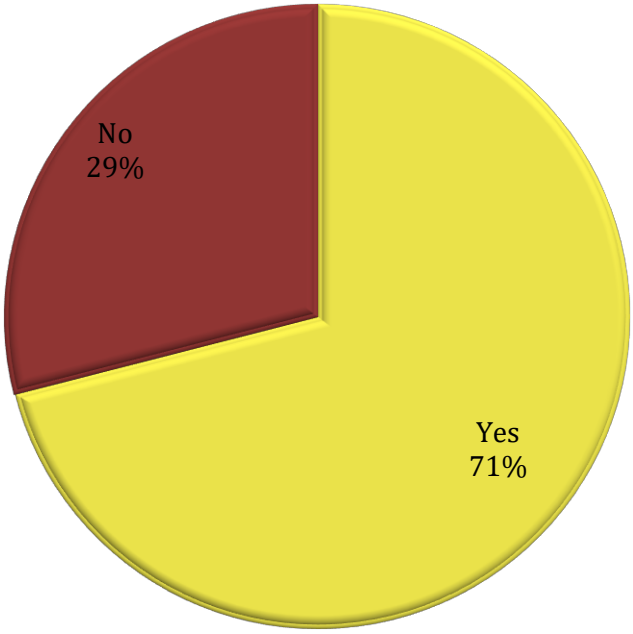
Value	Percent	Count
Yes	22.2%	160
No	77.8%	561
Total		721

Are you using any smart devices (smartphones, tablets) while shopping?



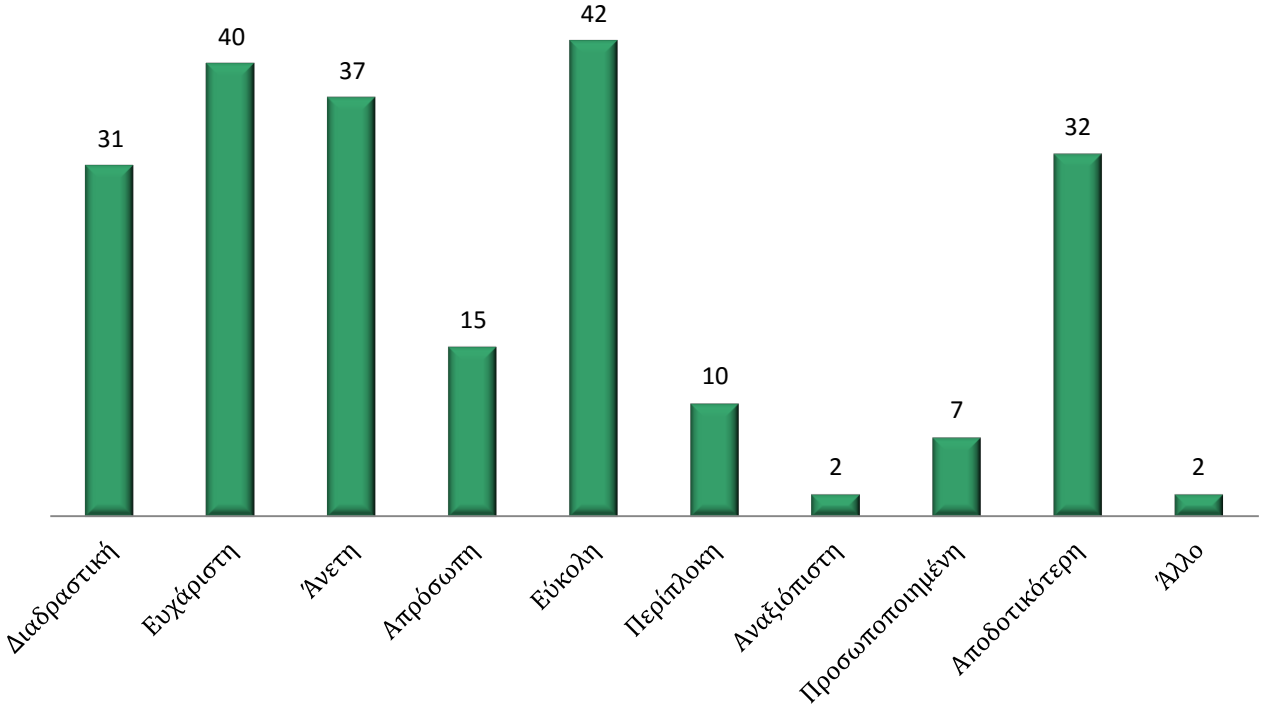
Value	Percent	Count
Yes	34.2%	266
No	65.8%	512
Total		778

Do you believe that there is a need for smartifying AB Vassilopoulos supermarkets?



Value	Percent	Count
Yes	70.9%	543
No	29.1%	223
Total		766

By smartifying AB Vassilopoulos supermarkets the shopping experience will become:



Value	Percent	Count
Interactive	31.4%	237
Pleasant	39.7%	300
Comfortable	36.6%	277
Impersonal	15.5%	117
Easy	41.7%	315
Complex	10.3%	78
Unreliable	2.1%	16
Personalized	7.0%	53
Effective	32.1%	243
Άλλο	2.4%	18
Total		756

Quantitative analysis results- Crosstabulation matrices

Age- Applications	<18	18-24	25-34	35-54	55+	Total
Interactive touch screens allowing ordering products in place without getting in the store	1 20.0%	61 32.1%	78 29.3%	46 19.0%	9 32.1%	195 26.7%
Customer behavior observation in order to predict their future needs	1 20.0%	26 13.7%	46 17.3%	28 11.6%	8 28.6%	109 14.9%
Smart devices used as shopping assistants	1 20.0%	88 46.3%	113 42.5%	84 34.7%	7 25.0%	293 40.1%
Smart self product scanning devices	0 0.0%	92 48.4%	148 55.6%	97 40.1%	9 32.1%	346 47.3%
Interactive screens showing messages with additional information about the product as soon as a customer passes by	0 0.0%	42 22.1%	45 16.9%	54 22.3%	5 17.9%	146 20.0%
Interactive navigation signs within the store	2 40.0%	97 51.1%	116 43.6%	108 44.6%	17 60.7%	340 46.5%
Interactive screens for store evaluation	0 0.0%	36 18.9%	41 15.4%	19 7.9%	5 17.9%	101 13.8%
Virtual reality	0 0.0%	23 12.1%	21 7.9%	11 4.5%	0 0.0%	55 7.5%
Interactive shopping windows	0 0.0%	21 11.1%	33 12.4%	23 9.5%	1 3.6%	78 10.7%
Customer behavior and statement observation in order to adjust the stores' conditions	1 20.0%	36 18.9%	31 11.7%	33 13.6%	2 7.1%	103 14.1%
Easy payments using credit cards or product scanning	1 20.0%	83 43.7%	117 44.0%	111 45.9%	18 64.3%	330 45.1%
Dynamic pricing	1 20.0%	54 28.4%	74 27.8%	60 24.8%	10 35.7%	199 27.2%
Adjusting the store conditions to decrease energy consumption	1 20.0%	59 31.1%	50 18.8%	35 14.5%	9 32.1%	154 21.1%
Total	5 0.7%	190 26.0%	266 36.4%	242 33.1%	28 3.8%	731

Chi-Square:

Pearson Chi-Square	102.9713
Degrees of Freedom	52
p-Value	0 (< 0.05, likely correlated)

Age- Shopping experience	< 18	18-24	25-34	35-54	55+	Total
Pleasant	4 80.0%	90 46.4%	109 40.2%	85 33.5%	12 41.4%	300 39.8%
Comfortable	2 40.0%	83 42.8%	107 39.5%	72 28.3%	13 44.8%	277 36.8%
Impersonal	0 0.0%	29 14.9%	38 14.0%	46 18.1%	4 13.8%	117 15.5%
Easy	1 20.0%	96 49.5%	114 42.1%	90 35.4%	13 44.8%	314 41.7%
Complex	1 20.0%	16 8.2%	20 7.4%	38 15.0%	2 6.9%	77 10.2%
Unreliable	0 0.0%	1 0.5%	6 2.2%	9 3.5%	0 0.0%	16 2.1%
Personalized	0 0.0%	14 7.2%	16 5.9%	20 7.9%	3 10.3%	53 7.0%
Effective	0 0.0%	75 38.7%	93 34.3%	64 25.2%	11 37.9%	243 32.3%
Total	5 0.7%	194 25.8%	271 36.0%	254 33.7%	29 3.9%	753

Chi-Square:

Pearson Chi-Square	52.1382	**p-Value**	0.04 (< 0.05, likely correlated)
Degrees of Freedom	36		

Age- Smart devices	<18	18-24	25-34	35-54	55+	Total
Yes	3 60.0%	67 33.8%	107 38.6%	80 30.3%	8 26.7%	265 34.2%
No	2 40.0%	131 66.2%	170 61.4%	184 69.7%	22 73.3%	509 65.8%
Total	5 0.6%	198 25.6%	277 35.8%	264 34.1%	30 3.9%	774

Chi-Square:

Pearson Chi-Square	6.4384
Degrees of Freedom	4
p-Value	0.1687 (> 0.05, not likely correlated)

Loyalty- Applications	>3 times/week	1-3 times/week	2 times/month	1 time/month	1 time/month	Total
Interactive touch screens allowing ordering products in place without getting in the store	25 35.7%	60 29.7%	46 23.1%	19 25.3%	31 25.8%	181 27.2%
Customer behavior observation in order to predict their future needs	12 17.1%	28 13.9%	33 16.6%	10 13.3%	20 16.7%	103 15.5%
Smart devices used as shopping assistants	22 31.4%	88 43.6%	79 39.7%	26 34.7%	52 43.3%	267 40.1%
Smart scanning devices providing additional information about the store and its products.	25 35.7%	93 46.0%	97 48.7%	47 62.7%	55 45.8%	317 47.6%
Conversation bubbles popped up soon as a	16	44	42	16	21	139

customer passes by various products	22.9%	21.8%	21.1%	21.3%	17.5%	20.9%
Interactive navigation signs within the store	32 45.7%	84 41.6%	98 49.2%	41 54.7%	56 46.7%	311 46.7%
Interactive screens for store evaluation	12 17.1%	21 10.4%	21 10.6%	11 14.7%	25 20.8%	90 13.5%
Virtual reality	9 12.9%	16 7.9%	9 4.5%	1 1.3%	15 12.5%	50 7.5%
Interactive shopping windows	15 21.4%	22 10.9%	18 9.0%	4 5.3%	11 9.2%	70 10.5%
Customer behavior and statement observation in order to adjust the stores' conditions	13 18.6%	32 15.8%	20 10.1%	9 12.0%	22 18.3%	96 14.4%
Easy payments using credit cards or product scanning	35 50.0%	102 50.5%	87 43.7%	32 42.7%	49 40.8%	305 45.8%
Dynamic pricing	21 30.0%	62 30.7%	43 21.6%	19 25.3%	35 29.2%	180 27.0%
Adjusting the store conditions to decrease energy consumption	17 24.3%	43 21.3%	40 20.1%	10 13.3%	30 25.0%	140 21.0%
Total	70 10.5%	202 30.3%	199 29.9%	75 11.3%	120 18.0%	666

Chi-Square:

Pearson Chi-Square	66.6946
Degrees of Freedom	52
p-Value	0.0826 (> 0.05, not likely correlated)

Loyalty- Shopping experience	>3 times/week	1-3 times/week	2 times/month	1 time/month	1 time/month	Total
Pleasant	27 38.0%	67 31.8%	65 32.3%	20 27.0%	32 25.8%	211 31.0%
Comfortable	34 47.9%	92 43.6%	72 35.8%	29 39.2%	50 40.3%	277 40.7%
Impersonal	25 35.2%	73 34.6%	79 39.3%	26 35.1%	47 37.9%	250 36.7%
Easy	11 15.5%	28 13.3%	33 16.4%	13 17.6%	21 16.9%	106 15.6%
Complex	31 43.7%	89 42.2%	86 42.8%	33 44.6%	47 37.9%	286 42.0%
Unreliable	9 12.7%	26 12.3%	16 8.0%	11 14.9%	12 9.7%	74 10.9%
Personalized	2 2.8%	5 2.4%	4 2.0%	1 1.4%	3 2.4%	15 2.2%
Effective	6 8.5%	17 8.1%	14 7.0%	2 2.7%	8 6.5%	47 6.9%
Pleasant	21 29.6%	66 31.3%	72 35.8%	29 39.2%	36 29.0%	224 32.9%
Other	1 1.4%	4 1.9%	4 2.0%	2 2.7%	7 5.6%	18 2.6%
Total	71 10.4%	211 31.0%	201 29.5%	74 10.9%	124 18.2%	681

Chi-Square:

Pearson Chi-Square	22.1814
Degrees of Freedom	36
p-Value	0.9656 (> 0.05, not likely correlated)

Loyalty- Need	>3 times/week	1-3 times/week	2 times/month	1 time/month	1 time/month	Total
Yes	50 71.4%	154 71.3%	149 72.7%	55 72.4%	84 68.3%	492 71.3%
No	20 28.6%	62 28.7%	56 27.3%	21 27.6%	39 31.7%	198 28.7%
Total	70 10.1%	216 31.3%	205 29.7%	76 11.0%	123 17.8%	690

Chi-Square:

Pearson Chi-Square	0.7782
Degrees of Freedom	4
p-Value	0.9413 (> 0.05, not likely correlated)

Age- Need	<18	18-24	25-34	35-54	55+	Total
Yes	3 60.0%	142 72.4%	200 72.7%	172 66.7%	24 82.8%	541 70.9%
No	2 40.0%	54 27.6%	75 27.3%	86 33.3%	5 17.2%	222 29.1%
Total	5 0.7%	196 25.7%	275 36.0%	258 33.8%	29 3.8%	763

Chi-Square:;

Pearson Chi-Square	5.179
Degrees of Freedom	4
p-Value	0.2694 (> 0.05, not likely correlated)

Education-Need	No high school	Some high school	High school graduate	Some college	Technical training	College graduate	Some post graduate work	Post graduate degree	Total
Yes	3 60.0%	3 50.0%	46 70.8%	43 60.6%	70 72.2%	254 70.6%	112 78.3%	9 75.0%	540 71.1%
No	2 40.0%	3 50.0%	19 29.2%	28 39.4%	27 27.8%	106 29.4%	31 21.7%	3 25.0%	219 28.9%
Total	5 0.7%	6 0.8%	65 8.6%	71 9.4%	97 12.8%	360 47.4%	143 18.8%	12 1.6%	759

Chi-Square:

Pearson Chi-Square	9.2712
Degrees of Freedom	7
p-Value	0.2338 (> 0.05, not likely correlated)

Education- Applications	No high school	Some high school	High school graduate	Some college	Technical training	College graduate	Some post graduate work	Post graduate degree	Total
Interactive screens allowing shopping before getting in the store and ordering products	1 25.0%	1 20.0%	14 23.0%	8 11.9%	19 20.4%	106 30.3%	40 29.0%	6 50.0%	195 26.7%
Customer behavior observation to predict their future needs	1 25.0%	0 0.0%	5 8.2%	7 10.4%	18 19.4%	47 13.4%	29 21.0%	2 16.7%	109 14.9%
Smart devices used as shopping assistants	1 25.0%	1 20.0%	18 29.5%	18 26.9%	34 36.6%	152 43.4%	65 47.1%	4 33.3%	293 40.1%
Smart scanning devices providing additional information	2 50.0%	2 40.0%	22 36.1%	30 44.8%	39 41.9%	173 49.4%	71 51.4%	8 66.7%	347 47.5%
Interactive screens showing messages as soon as a customer passes by	0 0.0%	0 0.0%	10 16.4%	14 20.9%	20 21.5%	71 20.3%	24 17.4%	6 50.0%	145 19.9%

Interactive navigation signs within the store	1 25.0%	3 60.0%	21 34.4%	30 44.8%	37 39.8%	179 51.1%	62 44.9%	6 50.0%	339 46.4%
Interactive screens for store evaluation	1 25.0%	0 0.0%	4 6.6%	4 6.0%	8 8.6%	54 15.4%	26 18.8%	4 33.3%	101 13.8%
Virtual reality	0 0.0%	0 0.0%	4 6.6%	4 6.0%	6 6.5%	27 7.7%	12 8.7%	2 16.7%	55 7.5%
Interactive shopping windows	0 0.0%	0 0.0%	6 9.8%	2 3.0%	12 12.9%	44 12.6%	11 8.0%	3 25.0%	78 10.7%
Customer behavior and statement observation to adjust the stores' conditions	1 25.0%	0 0.0%	4 6.6%	9 13.4%	6 6.5%	60 17.1%	20 14.5%	3 25.0%	103 14.1%
Easy payments using credit cards or product scanning	1 25.0%	5 100.0%	23 37.7%	31 46.3%	30 32.3%	165 47.1%	67 48.6%	8 66.7%	330 45.2%
Dynamic pricing	1 25.0%	1 20.0%	10 16.4%	17 25.4%	18 194%	106 30.3%	40 29.0%	6 50.0%	199 27.3%
Adjusting the store conditions to decrease energy consumption	1 25.0%	1 20.0%	7 11.5%	7 10.4%	15 16.1%	86 24.6%	34 24.6%	3 25.0%	154 21.1%
Other	0 0.0%	0 0.0%	3 4.9%	1 1.5%	1 1.1%	6 1.7%	6 4.3%	0 0.0%	17 2.3%
Total	4 0.5%	5 0.7%	61 8.4%	67 9.2%	93 12.7%	350 47.9%	138 18.9%	12 1.6%	730

Chi-Square:

Pearson Chi-Square	118.9247
Degrees of Freedom	91
p-Value	0.0263 (< 0.05, likely correlated)

Education- Shopping experience	No high school	Some high school	High school graduate	Some college	Technical training	College graduate	Some post graduate work	Post graduate degree	Total
Pleasant	2 40.0%	0 0.0%	7 10.9%	17 23.3%	28 29.5%	122 34.1%	58 41.7%	3 27.3%	237 31.6%
Comfortable	1 20.0%	1 20.0%	25 39.1%	25 34.2%	34 35.8%	149 41.6%	57 41.0%	7 63.6%	299 39.9%
Impersonal	2 40.0%	2 40.0%	27 42.2%	18 24.7%	41 43.2%	132 36.9%	51 36.7%	3 27.3%	276 36.8%
Easy	0 0.0%	0 0.0%	6 9.4%	11 15.1%	13 13.7%	65 18.2%	19 13.7%	2 18.2%	116 15.5%
Complex	2 40.0%	3 60.0%	19 29.7%	29 39.7%	34 35.8%	161 45.0%	59 42.4%	6 54.5%	313 41.7%
Unreliable	1 20.0%	2 40.0%	8 12.5%	10 13.7%	10 10.5%	31 8.7%	14 10.1%	1 9.1%	77 10.3%
Personalized	0 0.0%	0 0.0%	2 3.1%	0 0.0%	5 5.3%	5 1.4%	3 2.2%	0 0.0%	15 2.0%
Effective	0 0.0%	0 0.0%	0 0.0%	3 4.1%	2 2.1%	31 8.7%	12 8.6%	4 36.4%	52 6.9%
Pleasant	1 20.0%	2 40.0%	14 21.9%	19 26.0%	22 23.2%	125 34.9%	55 39.6%	5 45.5%	243 32.4%
Total	5 0.7%	5 0.7%	64 8.5%	73 9.7%	95 12.7%	358 47.7%	139 18.5%	11 1.5%	750

Chi-Square:

Pearson Chi-Square	88.975
Degrees of Freedom	63
p-Value	0.0173 (< 0.05, likely correlated)