

Bachelor's thesis

Business Administration

Business Academy

2014

El Mahboul Abdelaziz

SMART SHOPPING CART SYSTEM

A new innovation for Grocery Industry



TURUN AMMATTIKORKEAKOULU
TURKU UNIVERSITY OF APPLIED SCIENCES

Abdelaziz El Mahboul

SMART SHOPPING CART SYSTEM

The purpose of this thesis was to create a new shopping process concept for the groceries, with the aim to simplify the whole shopping process for customers by using a computerized shopping cart.

The concept that was developed is called (Smart shopping cart) and it comprises main server and at least one computerized shopping cart (tablet computer), with RFID reader designed for scanning the information from bar codes of the goods loaded on the cart, with the help to the communication link with the said server.

The Smart Shopping System will require two components: a website that the user can access to create a customized environment, including new shopping lists, and a self-checkout component that will scan all items in the shopping cart and prevent the shopper from waiting in lines at the check-out.

Customers will be able to perform many tasks included in the main functionality of touch screen tablets. For instance search for products, self-scanning prices, daily deals, the result will be shown on the display.

Smart shopping cart system was developed from the perspective of customer whose needs were not fully fulfilled once he takes part of the shopping system process.

Frankly speaking, we all know as customers we had once in our life time all face unpleasant situations in grocery, such as for example how hard to search for stuff to find out about the price of item? How difficult to find out about daily-deals? Did we find them easily or did we need to search the whole store for them? Was it comfortable or crowded? How about wait time in queue? How long time did you wait, did it take until we check out? Was it pleasant or frustrating?

Therefore we can conclude without doubts after long analyze of survey and customers feedbacks that the quality of customer service in grocery industry in general is totally poor and insufficient.

This absence comes automatically as a result that grocery industry is currently not driven by product innovations rather than profitability, but in fact the research shows that service innovation can be a key differentiator and driver for competitiveness in the future.

Therefore by using this new innovative system all part of shopping process will be winners: Customers will reduce wait time, simplify the shopping process, knowing what and where to buy it, making their shopping process more pleasant and manageable.

For groceries: They can increase sales (both in terms of immediate impulse buys and future customer loyalty) by producing happier customers.

Additionally, it will increase their staff productivity (thus decreasing their costs) by efficiently matching staff members to customers.

Furthermore, it gives them management data about their customers and their processes, which can lead to ongoing competitive advantages.

KEYWORDS:

**Innovation –customer service – shopping cart tablet computer - service delivery-
service design**

OPINNÄYTETYÖ (AMK) | TIIVISTELMÄ
TURUN AMMATTIKORKEAKOULU

Koulutusohjelman nimi | Suuntautumisvaihtoehdon nimi

Opinnäytetyön valmistumisajankohta | Sivumäärä

Ohjaaja(t)

Tekijä(t)

OPINNÄYTETYÖN NIMI

(Kirjoita tiivistelmä tähän, maksimi merkkimäärä on 2000).

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nunc augue metus, tristique a semper accumsan, pretium fringilla arcu. Nullam ut lectus magna. In dictum mollis magna, vitae elementum diam imperdiet ac. Ut orci metus, luctus non suscipit id, varius lobortis risus. Vivamus porta, mauris in tristique pulvinar, lorem dolor molestie eros, sed semper orci turpis et nunc. Pellentesque laoreet luctus odio ut egestas.

Mauris quis pretium felis. Donec a turpis risus. Integer vitae turpis a sem vestibulum placerat in ac sapien. Aenean lacinia, dolor facilisis varius hendrerit, neque lacus varius turpis, nec pellentesque nibh ipsum sed erat. Sed ornare ligula ac mi porttitor sed pretium lectus placerat.

Donec aliquam, tellus placerat commodo vestibulum, libero ligula scelerisque ante, sit amet volutpat massa magna et ipsum. Praesent erat leo, vulputate eu pulvinar in, fringilla eu metus. Curabitur condimentum arcu et massa molestie lacinia. Sed fringilla convallis nulla. Nulla ac lectus elit, at accumsan diam. Donec tincidunt ullamcorper massa, sit amet volutpat orci facilisis nec. In hac habitasse platea dictumst. Praesent vel ligula turpis. Aenean pharetra euismod mauris vitae blandit. Sed laoreet, leo ac feugiat accumsan, nunc quam fermentum erat, non ultrices est ligula vel sem. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus.

Vivamus mollis ligula in metus dapibus ut hendrerit neque mattis. Nullam volutpat nulla ac nisi eleifend in ornare dolor semper. In scelerisque adipiscing faucibus. Mauris ullamcorper sollicitudin ante vel scelerisque. Donec eleifend imperdiet pharetra. Duis enim lacus, iaculis a lacinia et, pretium vel tortor.

Proin mollis lacus ut leo egestas sed tempus ligula consectetur. Suspendisse fringilla, mauris quis vulputate pulvinar, velit ipsum rhoncus nibh, ut luctus leo ante vitae nisi. Phasellus at mauris justo. Etiam nulla orci, euismod et massa nunc.

ASIASANAT:

(Kirjoita asiasanat tähän. Etsi sopivia asiasanoja ONKI -ontologiapalvelun YSA (Yleinen suomalainen asiasanasto) ja MUSA (Musiikin asiasanasto) asiasanastoista.

CONTENT

1. SERVICE DESIGN	6
1.1 Service: Definition	6
1.2 Service design: definition	8
1.3 Why Service design	8
1.4 Principles of Service design	9
1.5 Service design process	11
2. INNOVATION METRICS	12
2.1 What is innovation?	12
2.2 The innovation funnel	14
2.2 Service design as innovative process	15
2.3 Tools of service process innovation	16
2.3.1 Service blueprint	16
2.3.2 Customer journey map	17
2.3.3 Service inventory	18
2.3.4 Stakeholder maps	18
3. PROBLEMS RELATED TO GROCERY INDUSTRY	20
3.1 Supermarket Shopping: Every Day Problems,Hazards and Frustrations	20
3.2 Stores in the past and in the present	23
3.3 How the smart shopping cart system works ?	25
3.4 Main functions of smart shopping cart.	31
3.5 Advantages for customers	42
3.6 Advantages for business	43
5.THE FUTURE RETAIL STORE: HOW IT WILL LOOK	44
5.1 Retail touch points	45
5.2 Customer journey through the mobile-enabled store	46
6. HOW TO MAKE SMART SHOPPING CART SYSTEM A REALITY	53
6.1 Key drivers for technology adoption	53
7. CONCLUSION	54
SOURCE MATERIAL	56

APPENDICES

- Appendix 1. Heading of appendix
- Appendix 2. Heading of appendix

PICTURES

Picture 1. Tablet with with card reader and bar code reader	26
Picture 2. Smart shopping cart prototype .as imagined	28
Picture 3. Charging station	29
Picture 4. Example of station protection from thieves	30
Picture 5. Example of shopping process	46
Picture 6. Showing daily offers	47
Picture 7. Tablet computer displaying product nutritional information	48
Picture 8. Self scan products(prices . date of expiration nutrition)	49
Picture 9. Follow-Me queue	49
Picture 10. Example of Payment	50
Picture 11. Bank cards payment	50
Picture 12. Example of self-check out points	51
Picture 13. Example of Cash-Acceptor-Machine	52

FIGURES

Figure 1. Model of the Service Concept (Edvarsson, 1997)	6
Figure 2. Axioms of service design.	9
Figure 3. Design process by RED Design Council (2005)	12
Figure 4. The innovation "funnel"	14
Figure 5. Comparison of frameworks.	16
Figure 6. Service blueprint	17
Figure 7. Customer journey map	18
Figure 8. Service inventory	18
Figure 9. Stakeholder map	19
Figure 10. Example of problem related to the customers	21
Figure 11. Experience Radar 2013 US Grocery industry	22
Figure 12. blue print of tablet computer	26
Figure 13. blue print of smart shopping cart	27
Figure 14. illustrates smart shopping cart system in the whole	28
Figure 15. Queue Option	34
Figure 16. features of smart shopping cart system.	37
Figure 17. Retail touch points	45

TABLES

Table 1. Illustrates main benefits for both customers and business	42
--	----

LIST OF ABBREVIATIONS (OR) SYMBOLS

RFID	Radio-frequency identification is the wireless non-contact use of radio-frequency electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects (Wikipedia)
ASP	An Application Service Provider (ASP) is a business that offers software services to customers, using computer networks and the Internet as the mechanism to deliver and manage the service.

1. SERVICE DESIGN

It is vital to mention that there is a lack of knowledge in how new services should be created. While the global economy is shifting from manufacturing towards services it is important to understand and have knowledge about the new service design process. (Smith et. al, 2007; Edgett 1994). In this chapter, we focus more on the meaning of service in general and service design specifically. We will try to find out the link between the principle and the process of service design in order to achieve business's goals.

1.1 Service: Definition

Service concept is a description of customer needs and how those needs are fulfilled in order to satisfy customers. Task of service development is to create the prerequisites for service which the customer finds to be attractive. (Edvardsson et al. 2002 & Smith et al. 2007)

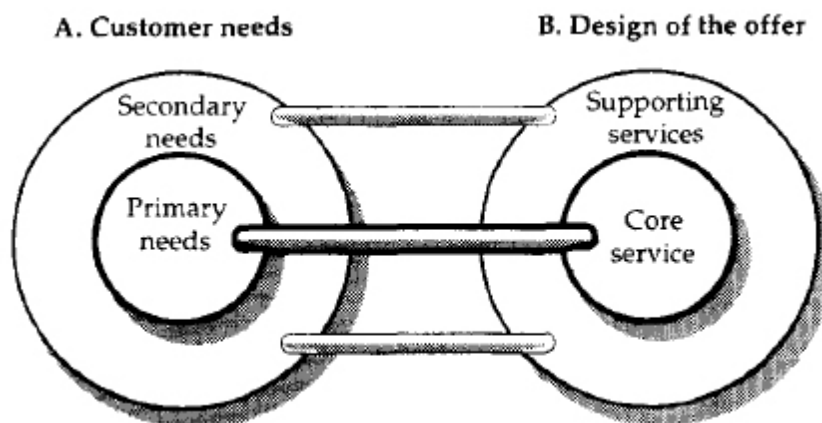


Figure 1. Model of the Service Concept (Edvardsson, 1997)

The service concept describes in more detail what are customers 'needs: how they perceive value and how they are.' What emphasizes on finding out the specific needs of the target customers; while "how" focuses on determining competitive priorities which enable companies to meet those needs (Johnston, Chase, Menor, and Roth 2000)

Services are intangible this explains the challenge of finding ways to create concrete manifestations and representations for clear communication of the service value. It is vital to notice that consumption is not separate from production as physical products. Thus, both activities take place simultaneously (Moritz 2005, 29).

Accessibility is a crucial element since it deals with many issues. It is about considering special requirements of users, who might need simpler interactions or adaptability to their inability to see or talk (Gube 2010). In addition, accessibility is about the importance on how the user has access to an interaction most of the times. As services are intangible and do not take up any physical space, it creates the subconscious assumption that the reception can easily be made available for extended periods of time during the day (Moritz 2005, 29). Having an easily accessible service improves the visibility to potential clients, an essential attribute in a competitive market.

The imperceptible nature of services results from the fact that they cannot be owned. One cannot take a service home for neither storage nor can one export or transport it to a specific location, but it is rather only possible to use when needed. Service cannot be tested or examined before purchasing like tangible goods. It is produced and consumed at the same time. Every service is also different. (Shekar, 2007)

Finally, the measurability of quality is a problem service design which still has to be solved (Moritz 2005, 30). The abstract nature of a service makes the quality difficult to measure, as there are more qualitative than quantitative measures available.

To make service tangible to management, customers and suppliers is the biggest challenges. In this context all parties need to be involved in service design and need to have a shared understanding of the concept of service”

service in mind” to enable them to move from idea to implementation to ensure the service and meet customer needs(Johnston, Chase, Menor,& Roth 2000))

1.2 Service design: definition

Many years ago, most investors focus specially on research and design in manufacturing industry. Therefore, means and process of production were basically optimized; products were innovated and designed while development and design for services were ignored.

However, this situation is changing so fast and then comes Service Design. Service Interfaces are mostly designed for intangible products which are, from the customer’s point of view, useful, profitable and desirable; while they are effective, efficient and different for the supplier. The most important issue in service design is the fact that designer visualizes, formulates solutions that are not yet available by watching, interpreting customer’s needs and transform them into potential services or creation of new services.

Marc Fonteijn from service design agency 31 volts defines service design: “When you have two coffee shops right next to each other, that each sell the exact same coffee at the exact same price. Service Design is what make you walk into the one and not the other.” In the same context Nick Marsh from Engine Service Design responded with: ‘Good service design is the process of deliberately crafting our experience and delivery of services, to make them more valuable for the people that use and provide them.’(Mager, 2008)

1.3 Why Service design

Services have more development and marketing needs than tangible products. In particular the intangibility and experimental factors need for a research focus. (Edgett, 1994) Also service design is important for organizations planning to sustain and grow. Service design process can be complex, time consuming, costly and often unsuccessful. (Smith et. al, 2007)As the research show there is a lack of knowledge in how new services should be created. While the global economy is shifting from manufacturing towards services it is important to

understand and have knowledge about the NSD process. (Smith et. al, 2007; Edgett 1994)

1.4 Principles of Service design

To create an excellent Service Design it is wise to follow five guiding axioms that Marc Stickdorn mentions : User-centered, Co-creative, Sequencing, Evidencing, Holistic.

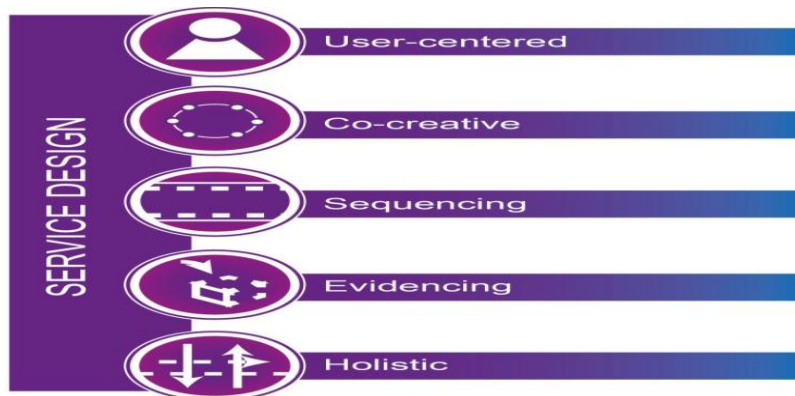


Figure 2.Axioms of service design.

1.User-centered: service is pretty much related to customers. Without a service we do not need to design one. Therefore,it is vital to have a clear understanding of habits, culture, social context and the motivations of the users. By having a user-centered approach, we can ensure the control of order within the chaos of multiple disciplines. (Stickdorn & Schneider 2011, 36-37.)

2.Co-creative: All stakeholders are included. Stakeholders are the people involved with the service provision as a whole (the staff, managers, providers, caretakers, users etc.). When designing a service, stakeholders should be involved, and in the case of the customer it must be kept in mind that the service would potentially deal with more than just one certain type of a paying customer. The more customers are involved in the design process, the more the service will result in increased customer loyalty. (Stickdorn & Schneider 2011, 38-39.) Involved users early and often is the key issue in the service design as Maria Hayhow mentions: 'The multiple asks for user-participation in "One More Time" allows users to feel like part of the designer and merchant

selection process, while the "SketchPad to Shelf" collateral allows users to experience even more of the creation process."

3. Sequencing: When a service is being delivered a specific timeline should be followed from the moment of marketing to the delivery of the service. Services are like movies, where there should always be a sense of expectation without causing any pressure on the customer. The customer might otherwise get bored in an excessively long process (waiting at the airport check-in line). The sequence of the service must start from the realization of a need to how it is being fulfilled.

Finally, in order to ensure perfection, services should be performed after many rehearsals. Through continuous testing and evaluation of the service process, we can guarantee a successful provision. (Stickdorn & Schneider 2011, 40-41.)

4. Evidencing: The intangible needs a tangible meaning. As mentioned earlier, all service experiences are intangible, but in order to communicate the service value to the customer, tangible manifestations are needed throughout the process (Moritz 2005, 29). Most of the services are taking place unnoticed in the background (back office), thus creating the need to make customers more aware of the actions taking place. The customer must know what he/she is paying for to avoid any kind of surprises.

The challenge in evidencing; however, a service must be designed in such a way that it does not interfere with the customer. Spam e-mails are a typical example of evidencing gone wrong which must be avoided. The tangible manifestations provided must be small and have the ability to prolong the positive experience from a service to enhance word of mouth. (Stickdorn & Schneider 2011, 42-43.)

5. Holistic: The entire service environment. The holistic approach needed is probably the most important element for both the design process and the service itself. Even though interactions are intangible, they usually take place in physical or virtual environments where all stake-holders and their needs must

be considered. When a physical space is being used, it is good to take advantage of the senses and influence the subconscious.

By being holistic, we ensure that the corporate identity embodied by the management and the staff is the same image perceived by customers. (Stickdorn & Schneider 2011, 44-45.)

By combining the principles mentioned and the requirements of what makes a service (see Chapters 1.2) we are able to have a clear picture about service design is necessary. The process is quite complex and generic, and needs better facilitation.

1.5 Service design process

According to the British Design Council (2005, 6-7), the design process can be depicted in a model, also known as the “double diamond” model. The model is divided in four phases: Discover, Define, Develop and Deliver. They are all applicable in any design task.

'Discover' deals with gathering and identifying insights of customers through market and user research, analyzing users, fact-finding etc. Key activities of the Define stage are: project development, project management and project sign-off. 'Define' phase service ideas are generated by translating insights into practical, tangible service solutions (Stickdorn & Schneider, 2011, RED, 2005, Moritz, 2005). The key objectives of Develop stage are: multi-disciplinary working, visual management, development methods and testing. Ideas are tested and refined (Stickdorn & Schneider, 2011). Thus enable the development of specific solutions for the users.

'Deliver' is the final phase where final testing, production and launching are dealt with and finalized in the relevant market.

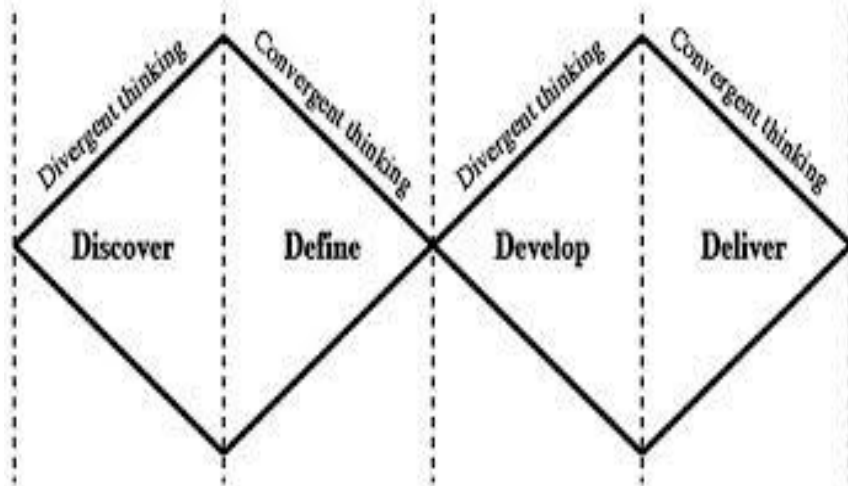


Figure 3. Design process by RED Design Council (2005)

2. INNOVATION METRICS

In today's economy, there is a continuous need for better innovation metrics to reflect today's knowledge to ensure that the businesses continue to be most attractive environment. High quality, relevant and more timely innovation metrics will improve management understanding. Thus improve business strategies.

Current metrics mostly reflect on productivity instead of ideas and systems. However, innovation is a complex process which cannot be measured with only one indicator, but with the application of relevant quantitative data.

Innovation metrics can be achieved to assist in a better understanding of the possibilities presented by the discipline. (Milbergs & Vonortas 2008, 2-3.)

2.1 What is innovation?

In some areas, an innovation can be defined as something new and has been adopted.

The theory for adoption of an innovation, called diffusion of innovations, considers the likeli-hood that an innovation is adopted.

Diffusion of an innovation happens through a five step process which are knowledge, persuasion, decision, implementation and confirmation (Rogers 1962 , 79).

In the social sciences, innovation is an important topic in the study of economics, environment, entrepreneurship, design, technology, sociology and engineering. In society, innovation makes our daily lives more comfortable and convenient (Rawsthorn, 2011).

In the organizational context, innovation could link to positive changes in efficiency, productivity, quality, competitiveness, market share.

The word innovation is defined as" the process by which an idea or invention is converted into a good or service for which people will pay, or something that results from this process"(Website of business dictionary 2012).

Innovation is all about creating business value. Value can come in the form of products, services, reduction of costs, increase of sales, and so on.

It is obvious that people trying to create value in order to survive and grow within a market.

It has been proved that innovation has helped companies to achieve their objectives; while those that have not appreciated it have slowly faded away. (Morris 2008, 2.)

In theory, innovation is about coming up with original ideas, ameliorating them to something of real use and launching them to a market segment in order to be transformed into efficient financial value. (Morris 2008, 2.)

According to DeSai (2008, 2) innovation is about "harvesting the deep insights of an organization's human spirit and knowledge, generating a pipeline of ideas that are evaluated, selected, and ventured using disciplined tools, methods and processes that advances growth objectives for an organization."

2.2 The innovation funnel

The innovation framework can be explained as a “funnel” (see Figure 7), where many ideas go through one end and only the best ones are filtered through the other.

The process is divided in three primary parts and nine secondary divisions. Exploration, is about achieving a clear understanding of the situation at hand, followed by Creation and Reflection, which refer to the prospect of possibilities and willingness to make mistakes before testing them. Implementation is where investments should turn into profit after launching the product/system. (Stickdorn & Schneider 2011, 128-135.)

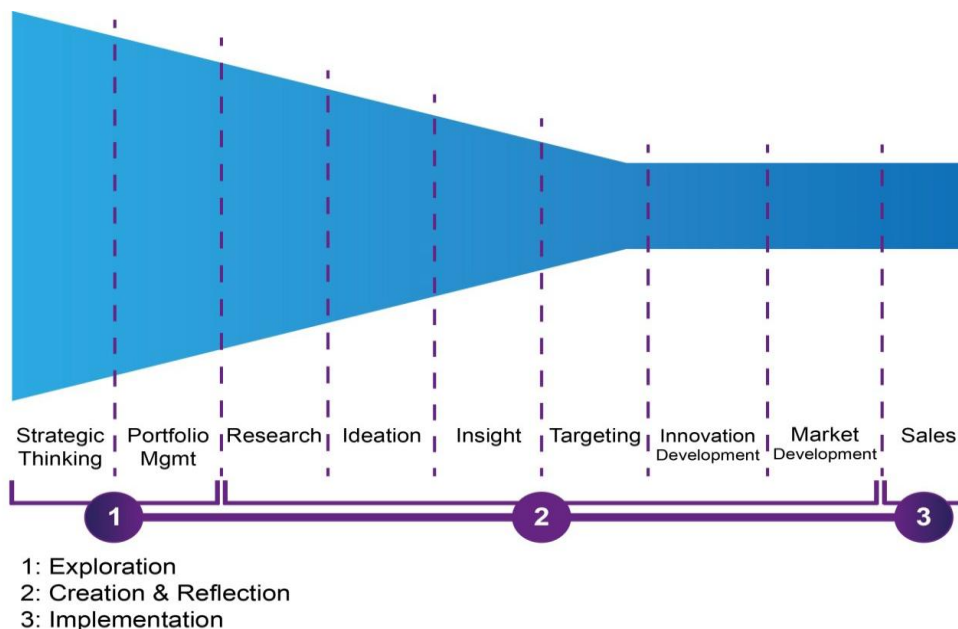


Figure 4. The innovation “funnel”

The divisions are:

1. Exploration:

- a. Strategic Thinking: identifying innovative process’s goals.
- b. Portfolio Management: Managing a portfolio of innovation projects to increase chances of successful results.

2. Creation and Reflection:

- a. Research: Accumulating knowledge about the technological possibilities about user needs.
- b. Ideation: Applying knowledge from research to what it could mean for existing or future products and systems.
- c. Insight: concretizing ideas to innovation opportunities.
- d. Targeting: Bundling processes needed after reaching to the necessary insights.
- e. Innovation development: The engagement with actions needed to convert the final ideas to finished products through testing.
- f. Market development: Answering the questions of what customers want and how to get it to them.

3. Implementation:

- a. Selling: selling the products and/or services being developed and receiving financial revenue and /or services being developed and receiving financial revenue and/or profit to the organization. (Morris 2008, 4-15.)

2.2 Service design as innovative process

Innovation and service design are much related to each other. This is proven by the simple comparison of the frameworks which shows that there is an obvious similarity. Both entities are divided into six tasks, which, despite their alternations in titles, refer to the same nature of activity (see Figure 8).

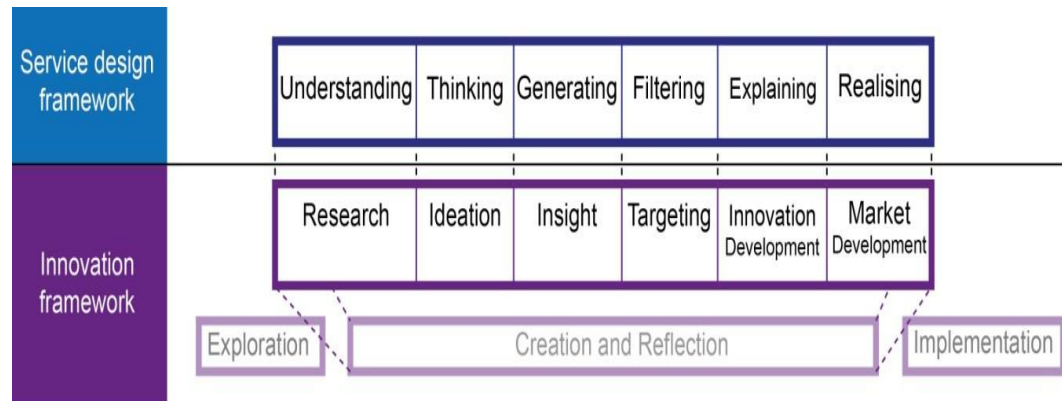


Figure 5. Comparison of frameworks.

Therefore, the association of innovation is justifiable. Innovation metrics, which assists in measuring (managing) the innovative process behind service design, has been found to be the discipline based on which the process advanced to the final result. Innovation metrics has existed in the industry for some time already; therefore, it is safe enough to use it as a point of innuendo for the conclusions needed.

2.3 Tools of service process innovation

Four main tools are used in the field of service design to provide a clear understanding of any service provision process.

These tools are described in sections 2.4.1, 2.4.2, 2.4.3, 2.4.4.

2.3.1 Service blueprint

Service blueprints are visual specifications of the actions of the user, the service provider and stakeholders. Service blueprint provides guidance on how both front line staff and those behind the scenes will offer a service through different channels. Any possible touch points that are manifested throughout the service provision are shown and justified.

Support systems are also needed for a specific process, but not necessarily in sigh. (Stickdorn & Schneider 2011, 204.) Figure 9 provides an example.

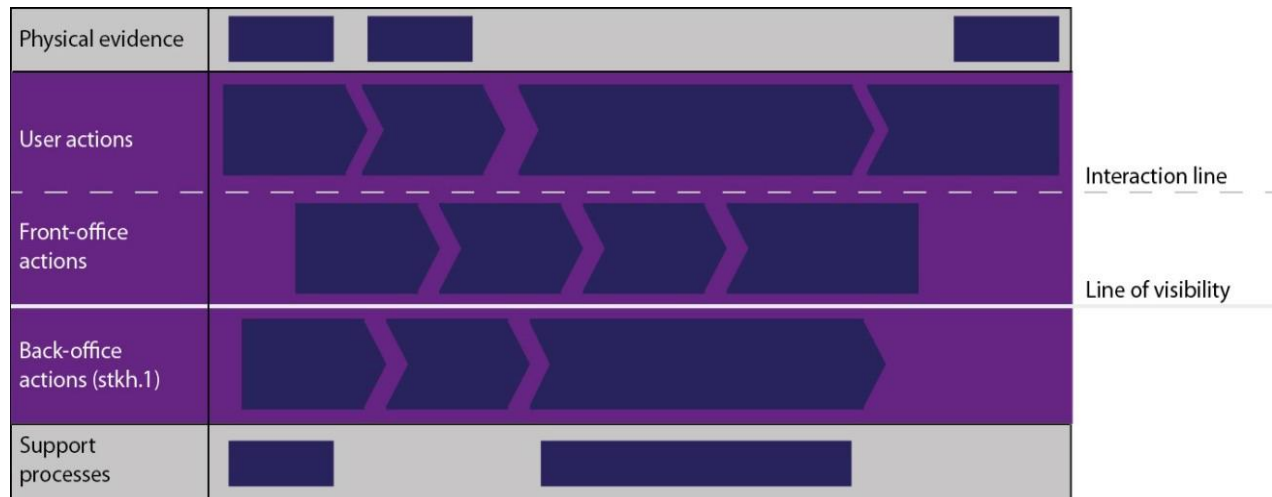


Figure 6. Service blueprint

Shostack provides another definition: 'service blueprints are process flow charts that are used specifically for designing service operations' (1984,133). Service blueprints help to identify the points in the service process where special attention must be paid: Where customers may be confused, where special attention should be paid by employees. However, the service blueprint is missing one crucial element: the inclusion of the different possible emotional states that customers might express through the process. Thus, managers need to map customer emotions so that they can better understand how to assess and improve their service. (Reichheld, 2006, 117.)

2.3.2 Customer journey map

A customer journey map is the visual manifestation of the user experience starting from the pre-service period (that represents the expectations by the users), to the service period (the experience itself) and ending with the post service period (how customer relationships are maintained and whether expectations were justified or exceeded or not).

The maps are used to tell story about the user's emotions and actions and how the touch points and various stakeholders are used throughout the process. (Stickdorn & Schneider 2011, 158.) Figure 6 provides an example.

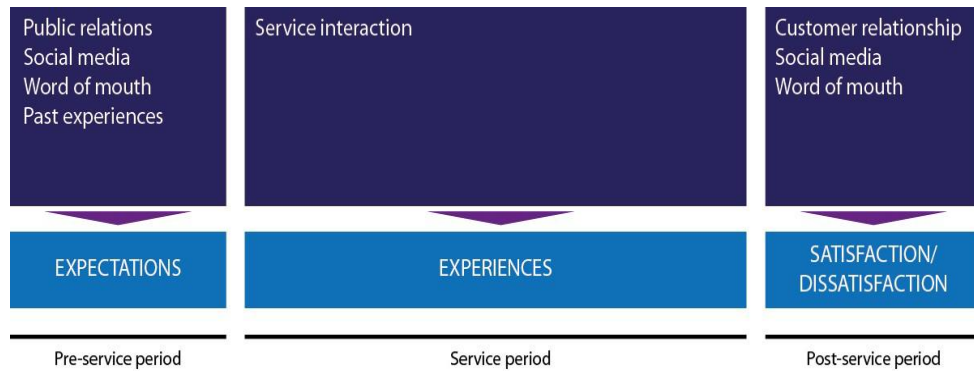


Figure 7. Customer journey map

2.3.3 Service inventory

The service inventory identifies all the touch points of user interaction with a service or a product and enlists all the possible services/solutions that are provided.

The visual frame displays a grid of both elements with all the necessary details and problems found. (Fritil-laria 2010.) Figure 7. illustrates an example of this.

	Touchpoint	Touchpoint	Touchpoint	Touchpoint	Touchpoint	Touchpoint	Touchpoint
Service 1	✓						
Service 2		✓		✓			

Figure 8. Service inventory

2.3.4 Stakeholder maps

The stakeholder map visualizes all the groups of people involved within the service environment, both internally and externally.

Mapping out these stakeholders makes it easier to chart the relationships between them in order to track down any possible faults or misunderstandings

that might affect the final service. (Stickdorn & Schneider 2011, 150.) Figure 8 illustrates an example.

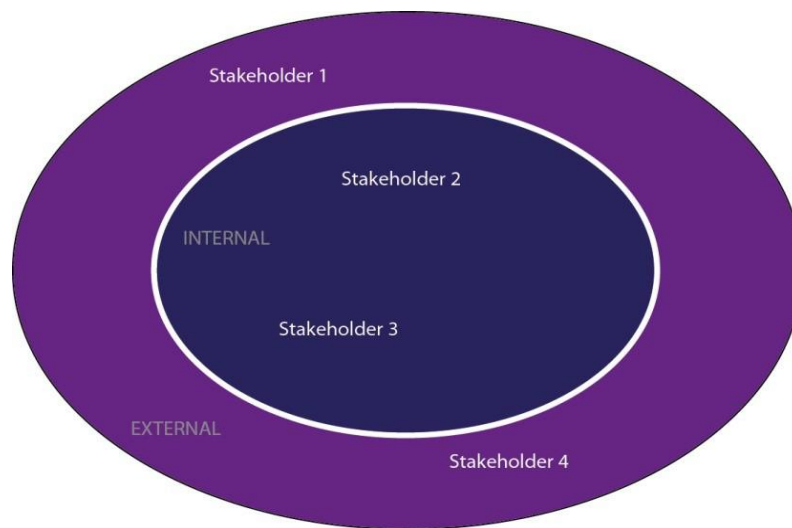


Figure 9. Stakeholder map

It has been clearly shown from the previous theoretical part that services need more development and marketing care and attention than tangible products, in particular the intangibility and experiential factors need for a research focus. Also as it has been shown that service design is important for organizations planning to sustain and grow even though the process can be complex, time consuming, costly and often unsuccessful. (Smith et. al, 2007).

As the research shows there is a lack of knowledge and literature about how new services should be created. (Smith et. al, 2007; Edgett 1994). The most important issue is the innovation metrics which play a crucial role in developing service design.

3. PROBLEMS RELATED TO GROCERY INDUSTRY

3.1 Supermarket Shopping: Every Day Problems, Hazards and Frustrations

We will begin treating our subject from the perspective of the customer. Let's think about the last time you went to your favorite grocery. Can you remember all of the different steps that were involved? Did you have trouble finding the products that you were looking for? Did you search for stuff to find out about the price of item? How about daily offers, did you find them easily or did you need to search the whole store for them? How about products in sale, did you need to count for a long time, what the final price will be if the sale was for example 30% or 50%? Was it comfortable or crowded? Did you need to wait in queue and for how long time did you wait until you reach the cashier?

All of these questions pertain to the grocery's service delivery process; which interacts directly with the customer. How it is designed and aligned to meet the needs of the customer is critical to the success of the grocery.

To be more specific about the problem of system delivery we should use some feedback from real customers in order to develop a better system and overtake some problematic issues that nowadays grocery face.

Grocery shopping is among the most common activities of the adult population. Love it or hate it, we are often at the supermarket.

According to the time use Institute, some 32 million American adults shop at a grocery store on any given day, one out of every seven adults nationwide.

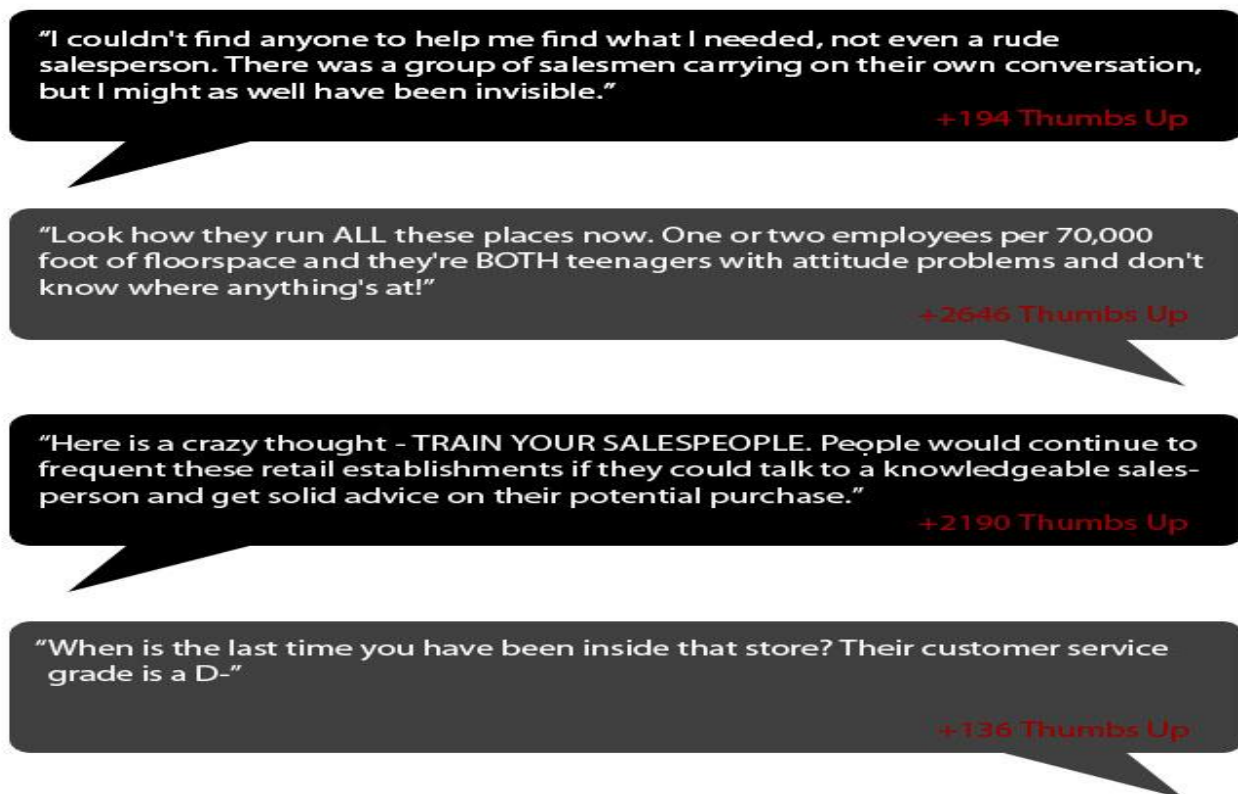


Figure 10. Example of problem related to the customers

In this for example of feedback we can conclude the customer service in stores is merely poor and needed to be developed according to customers needs. This is because at the end the only loser in this equation is not customer but the grocery itself. The customer has simply an alternative to switch between groceries and look for the best one who fulfils his needs.

"It's important for grocery stores and supermarkets to focus on developing excellent customer experiences today," said Brian Jones, vice president of Grocery and Customer Packaged Goods at Empathica. "Supermarket chains, in particular, often maintain similar prices and offerings. Experiences are what differentiate one retailer from the next. Understanding the key elements of the experience that drive loyalty can give a supermarket the edge, enabling them to build out better offerings."

The Empathica Customer Insights Panel specifically looked at what customers value in their grocery experience and how those expectations are being met by

grocery stores across Canada and the U.S. Customers indicated the in store grocery store qualities that continue to disappoint and “never” or “only sometimes” meet their expectations include the following:

1. Checkout lanes and lines (55.9%)
2. Customer Service (44.1%)
3. Selection of fresh meats (42.2%)
4. Selection of fruits and vegetables (42.1%)
5. Selection of fresh seafood (41.7%)
6. Modern updated stores (41.5%)

What we can understand from the statistic above that the features based on customer demand and willingness to pay for each feature.

The percentages indicate the premium size customers are willing to pay for each feature.

Moreover according to a recent study, over 20 % customers will abandon their purchases or give up totally from getting needed services and walk out of the store when faced with long lines that appear stagnant.

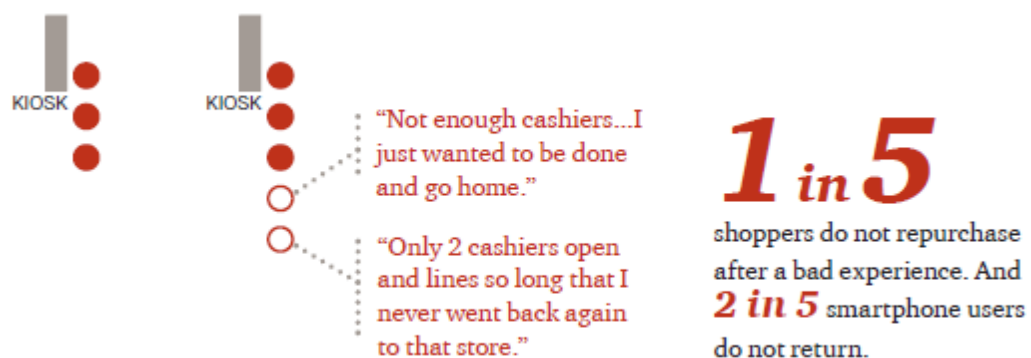


Figure 11. Experience Radar 2013 | US Grocery industry

With intense competition in the grocery industry ,are stores ready to lose more customers? Customer satisfaction is the key to the success of any business;

some store they might offer the best customer finance products to their customers, but if in general customer experience is poor, nothing else matters. Enhancing the overall customer experience a guaranteed way to see pleasant faces is by eliminating physical queues for services and giving a unique and innovative experience to their customers.

3.2 Stores in the past and in the present

Currently, the service quality is highly important for the retail trade. It determines not only the retail chain's reputation, but also the turnover and profit.

As the society enters the age of information technology, the smart shopping cart should not be a complicated process for the customers at the shopping centers. Despite the fact that information technology has made significant advances, today's shopping process at the supermarkets has remained almost unchanged.

As most people have experienced, the basic steps involved in grocery shopping are: making a list, typically with pen and paper, going to the grocery store and finding all the items on the list, and paying for the items at the checkout. There are several problems with this system. People often forget their lists at home, or lose them altogether.

If customers do remember to bring their list to the store, they often don't have a pen with them which makes it difficult to check off the items they have found, and are forced to read over the entire list many times to determine what they have and what they still need to get.

Finding the items in the store can also be problematic, especially if it is an unusual item or if it's the first time a customer shops at that store.

Customers can easily spend 5 or 10 minutes wandering around the store looking for an item, more so in a big store. Purchasing in groceries can also take a considerable amount of time. It has been estimated that on average

customers spend 10 minutes waiting in line and checking out, and could easily spend 25 minutes if the line-up is long.

Other difficulties involved in grocery shopping include for instance having to read all the ingredients on a product to check whether it contains an ingredient you are allergic to.

Problems related to the traditional shopping process:

- Not knowing about daily offers, can cost extra money and more time.
- Waiting in a long queue.
- Not knowing exactly how much you have bought, could cost more money and it may cost also extra work and time consuming once you will be obliged to return the items that you don't need or in case if you surpass your budget limits.
- Finding a product without knowing its own price.
- Searching for code reader to find out the real price of a specific item is not always easy task in giant grocery
- While shopping, it is often impossible to understand the price of the product, or whether it is on sale, because there was no time to update its price tag due to the untold daily variations.
- Lastly, the on board commercial message is almost ineffective.
- The data for each shopping cart cannot be qualified with the customer's data (age, profession, other information) and hence they are not useful for the purposes of a specific market research about customers (identifying the stereotype customer for that product).

Therefore, the traditional shopping process is not convenient at all by increasing the amount of wasted time customers spend in shopping and at the same time declining the quality of service.

Our system will focus on solving the problems mentioned above through a wireless electronic system mounted on the shopping cart.

Shopping carts as they exist today work quite well and we would only add to existing carts. We will retain features of the shopping cart like having a toddler seat, using coin deposits.

Therefore smart shopping cart system is the ultimate solution to overtake the obstacles that exist in nowadays shopping process systems.

3.3 How the smart shopping cart system works ?

Smart shopping cart can be described as a system that can simplify a shopping process in big stores or center shopping centers by using a computerized shopping cart.

Smart shopping cart system comprises main server and at least one computerized shopping cart tablet computer with RFID reader designed for scanning the information from bar codes of the good loaded on the cart.

With the help to the communication link with the said server customers will be able to perform many tasks included in the main functionality of touch screen tablets. For instance search for products, self-scanning prices, daily -deals, the result will be shown on the display.

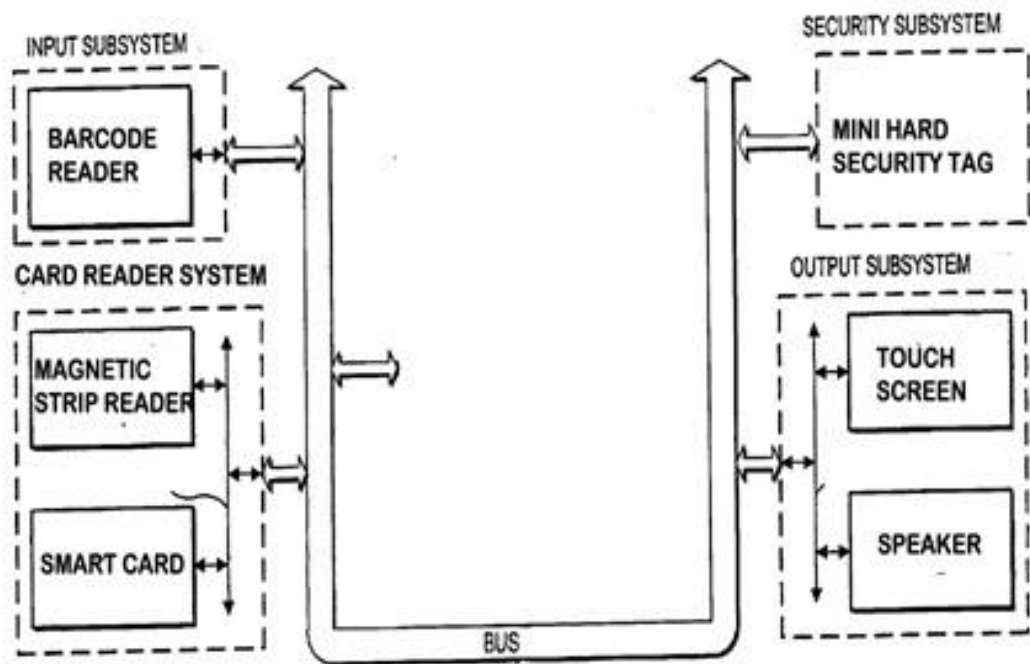


figure 12

Figure 12. blue print of tablet computer

:



Picture 1. Tablet with with card reader and bar code reader

In this way smart shopping cart will assist a shopper during his visit to a store., it will enable a shopper to check himself out of the store. The smart shopping

cart includes (tablet computer) touch screen display, equipped with scanner and bar code reader.

The tablet will display product specification, information such as the identity of an item selected for purchase, its price, nutritional contents, ingredients, expiration date, product reviews, daily offers, real time statue of cashiers and how many people are waiting in the queue, it will display also advertisements, promotional materials and surveys.

There will be as well playing video and games option especially for people who have kids. While kids they may play games or watching video, their parents could make their shop-ping peacefully without being disturbed.

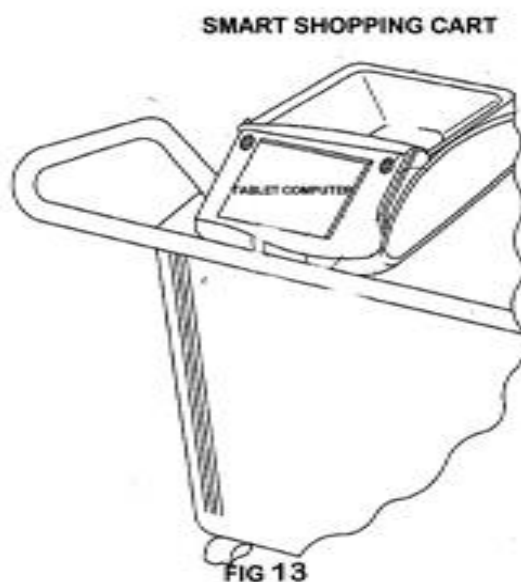


Figure 13. blue print of smart shopping cart

The smart shopping cart will store the material locally on shopper account once he will have an account with the grocery via his bonus card (Plussakortti, S-kortti) or retrieve it from a remote source through a network. The displayed information may be targeted, based on the customer identity; goods currently selected, purchase history, etc.



Picture 2. Smart shopping cart prototype .as imagined

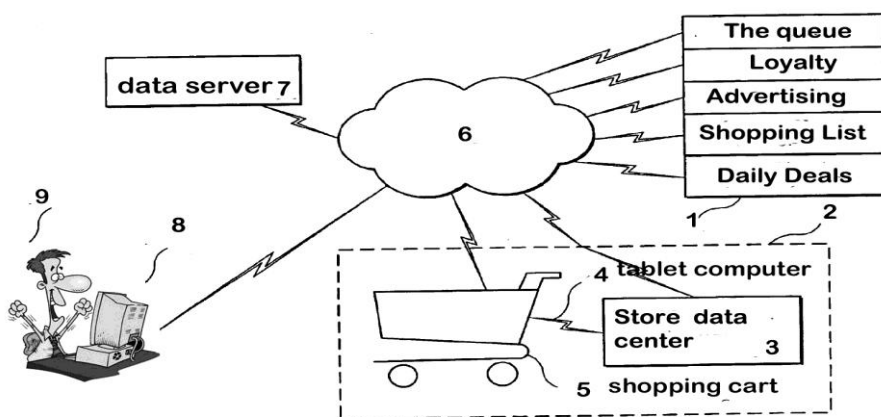


FIG 14

Figure 14.illustrates smart shopping cart system in the whole

In FIG.14, the Smart shopping cart system 9 includes one store data center 2 a data server 7, application service providers 1 and a personal computer 8. The system 9 also includes communications link 6. The link 6 connecting the store 2, data server 6, ASPs 1 and computer 8.

The tablet may be capable of electronic-signature capture and may be voice activated. It will have accessories coupled to it: a magnetic-strip reader, a smart-card reader, code bar reader or speakers.

In an alternate embodiment, a shopper may upload shopping lists from their personal digital assistants tablet, smartphone etc. to the shopping cart tablet.

The tablet computer may return gathered information to a central location such as a store data center or a store server farm.

a) How to charge a huge amount of smart shopping devices

- Creating one or many points (charging station) where tablet computers will be put to be charged.
- When customers get in into the shop first thing will be of front of them are those charging stations.
- Costumers will take touch screen device from charging station, and plug it in a specific palace in shopping carts



Picture 3.Charging station

- Customers will return touch screen devices to cash desk –this will also work as charging station -once their shopping will be done.
- When there will be enough touch screen devices in cash desk. Staffs will take them back to plug them into charging stations.



Picture 4.Example of station protection from thieves

(http://eshop.macsales.com/shop/Apple/iPad_Accessories/GripStand_Station)

b) How to protect smart shopping devices from thieves?

There will be two solutions to protect smart shopping devices from thieves, the first one is hardware and the second one is software.

1) Hardware security devices (alarm system)

Each device must have a protected cover, which one must have a small hall behind ,where mini hard security tag will be implanted.

2) Software

Creating a simple software program that shuts down automatically touch screen devices after nine o'clock.

To switch on a touch screen device requires always a password.

3.4 Main functions of smart shopping cart.

Main functions of smart shopping cart are described in the following pictures.



Self scanning:

Customers in supermarkets will use code bar reader which is integrated in tablet computer to scan products as they do their shopping. This option will help them to know more about the item for example its' price, nutritional contents, ingredients, expiration date and product reviews.



Advertising:

Advertising information will be display in the touch screen tablet computer.



Loyalty:

Tablet computer will replace physical loyalty cards, once a customer will make his shopping, all his loyalty points will be stored in in his account and he can even see and follow them from any other device mobile phone, pc, tablet etc.



In-store Navigation:

Customers will find products more easily while in a store, there will be no need to search for staff to ask where needed items are.



Shopping Lists:

Customers can build a shopping list on their mobile phone or make it from home and up-load it in their personal account and access it when doing their shopping from tablet computer.



Payment:

Customers will be able to pay directly from their account with their store if they have one since or they can with their bank card using magnetic strip reader in tablet computer.



Extended Packaging:

Customers will have an access to additional information about products through tablet computer (prices).



Follow the queue

This option will let customers to follow through their tablet computers the status of line in cashiers, how many are open and how many people are waiting in the line in real time, and it's up to customers to decide will they continue their shopping or go to cashiers.

Once customer will check the follow the queue option, tablet computer will display visually the status of line visually like in this example bellow :



Figure 15.Queue Option



Daily deals

With smart shopping cart customer Tablet computer will display Daily deals, for customer will be more practical to follow in real time the statue of those daily deal.



Calculation

Customers could buy exactly according to their budget, all scanned item prices will automatically be calculated. With this option they will have in advance a

clear picture about how much money they will spend once they will be in cashiers.



eReceipts:

Customers will not anymore need to have a physical receipts (paper receipts will be in history) because all their purchased items will be store electronically in their account moreover they can set an option that all his receipts will be send to his email or he can view his digital receipts via web or any other mobile devices.

This option will more useful as well for stores, because it provides an analytics and reporting dashboard to allow driven decision making.



Recipes:

Customers will have a choice whether to browser in internet for their favorite recipes or stores' own recipes, by doing so they can even know in advance how much will cost their recipes and where each ingredient is exactly located in the store.



Games & Cartoons

Finally customers can enjoy their shopping without being disturbed by their own kids since they can be in trolley and play games or watch videos.



Domestic button

With this option customers could easily know exactly all domestic products without asking or searching. All they need to do is to push the “domestic button” and they will have a search option, entering the name of the product, for instance cheese, the tablet computer will display all cheeses made in Finland and their exact production location.



Prize

Customers with this smart shopping cart system they will not any more need to fill appli-cation (name, phone number..) in case when store will organize a competition to win a price whether it's question of goods or money. Customers are able to participate by only pushing a button.










Feedback





Customers will be easily able to give feedback about their impression of store and whether they are satisfied or not. This is vital information for stores because it will help them to know what they need to improve in order to have satisfied customers.





Figure 16.features of smart shopping cart system.

Application	for customers	for business
<p>Self scanning</p> 	<ul style="list-style-type: none"> ✓ They can scan products in order to know their price, expire days, and additional information. ✓ Time saving. ✓ Having a clear picture about the item that they are willing to buy. 	<ul style="list-style-type: none"> ✓ No need for adding more staff in store to help customers who are looking to know more about items. ✓ Increasing the quality of customer service
<p>Advertisement</p> 	<ul style="list-style-type: none"> ✓ Customers will have a new channel to know about the products available in store 	<ul style="list-style-type: none"> ✓ According to research done by a company producing a similar product, advertising and promotions displayed at the POS showed “product movement of national brands from 23.4% to 46.8%”
<p>Loyalty</p> 	<ul style="list-style-type: none"> ✓ Customers will always have their loyalty cards with them since they will log into shopping cart system whether with their loyalty cards or just with given user name and passwords. 	<ul style="list-style-type: none"> ✓ Provide unique content to customers based on their transaction history.
<p>In store navigation</p> 	<ul style="list-style-type: none"> ✓ Time saving ✓ knowing exactly and in advance where needed items are located 	<ul style="list-style-type: none"> ✓ Improving the quality of their customer service ✓ By decreasing the number of their staff retailers will increase their

		profitability
<p>Shopping list</p> 	<p>✓ Customers will make their shopping lists before going to store will be upload to their account in smart shopping cart tablet .</p> <p>✓ Shopping list option will have an option of reminding customers that their shopping lists are complete or still missing items.</p>	<p>✓ More sells more profits</p>
<p>Payment</p> 	<p>✓ Customers will be able to pay just from their account with store by using their bank cards or using pay option in tablet computer.</p>	<p>✓ An additional method of payment .</p>
<p>Daily-deals</p> 	<p>✓ Customers will have a chance to follow daily deals from their own devices .PC.Tablets. laptop –smart phones.</p> <p>✓ While shopping ,customers will know in advance daily-deals</p>	<p>✓ Increasing their sells by informing their customers in advance about their daily-deals ,or special offers.</p>
<p>Extended packages</p>	<p>✓ Customers will be continuously in touch with their stores through</p>	<p>Stores will be open virtually 24 hours a day.</p>

	<p>their own devices and get daily additional information about products ,offers , prices ..</p>	
<p>Follow the queue</p> 	<ul style="list-style-type: none"> ✓ Time saving. ✓ Customers will be able to use their time more wisely and efficiently. ✓ Fast check out. 	<ul style="list-style-type: none"> ✓ Delivering excellent and unique customer service. ✓ More time customers will spend in shopping more sells stores will make.
<p>Calculation</p> 	<ul style="list-style-type: none"> ✓ Customers will know in advance how much money customers will need to pay in check out. ✓ They will be able to calculate products which are in sale and know exactly their final prices. 	<ul style="list-style-type: none"> ✓ A new study done by Atlanta grocery stores shows when shoppers know exactly how much they're spending, they were more likely to splurge on items like chocolate and brand name cookies, and even though they spent an average of almost 22% more.
<p>eReceipts</p> 	<ul style="list-style-type: none"> ✓ Customers will be able to view their digital receipts via web & mobile environments. <p>Customers will be able to</p>	<ul style="list-style-type: none"> ✓ Retailers can save up to 4€ per 1,000 transactions through using less paper

	<p>return a product without issue since eReceipts will be stored digitally in their personal emails or in their account with stores.</p> <p>✓ Customers can use the software's online tools to analyse their spending and budget better.</p>	<p>✓ Provide an analytics & reporting dashboard to allow data driven decision making</p>
<p>Recipes</p> 	<p>✓ Time saving</p> <p>✓ Stores recipes will give an opportunity to shoppers to find easily the ingredients and show exactly how much money they need to spend.</p>	<p>✓ Increasing their sales.</p>
<p>Winning</p> 	<p>✓ Shoppers will be able with this option to participate any time anywhere to winning prices that stores organize with one click and it's done.</p>	<p>✓ Avoiding cheaters since customers will have right just to participate once in prize which is organized by stores.</p> <p>✓ Saving money by not using papers.</p>

<p>Patriotic</p> 	<ul style="list-style-type: none"> ✓ Shoppers will be able to find out easily which and where are the product made in their own country. ✓ By buying their local products customer will help to boost their own economy and creating more jobs. ✓ when shoppers buy local more money stays in the community. 	<ul style="list-style-type: none"> ✓ Retailers will be seen as not only as greedy companies which their first aim is to make benefits but also as responsible ones. ✓ Encourage grocery stores to purchase more local products.
<p>Feedback</p> 	<ul style="list-style-type: none"> ✓ Shoppers will be able to give their feedback instantly about their stores' products or services. 	<ul style="list-style-type: none"> ✓ Improving customer service ✓ Helping retailers to devise better marketing strategies

Table 1. Illustrates main benefits for both customers and business

3.5 Advantages for customers

For customers, smart shopping cart system has the potential to

a) Make life easier: smart shopping cart system will give huge options to customers to make their shopping experience more pleasant and enjoyable for example in store navigation. Self-scanning will help them to get what they want more quickly.

Moreover simple services such as follow the queue will help customers to save time and avoid long queues, and shopping lists can help customers to manage their lives better.

b) Make life more meaningful by giving customers right tools which will help to make good choices. Smart shopping cart system services like extended packaging will allow them to choose products associated with values such as respect for the environment and ethical choices.

3.6 Advantages for business

By using mobile technology to meet customer needs for information and services, retailers can:

a) Increase sales: providing relevant information to customers between the point of sale and purchase decisions will increase the chances of buying process, in simple words better information means more sales.

b) Increase customer satisfaction and loyalty: Happy and satisfied customers will re-ward retailers who best meet their needs for information and services.

This will lead to help retailers to:

a) Achieve lower costs of selling

b) Increase repeat purchases from existing customers

c) Improve brand equity or price premium

d) Improve employee productivity, satisfaction, and retention

e) Allow increased personalization –meeting customer needs even better.

f) Add value to physical products and experiences through digital services

g) Lower their marginal costs of doing business by being less reliant on so many employees.

h) The ability to monitor customers' actions means far less potential theft.

5. THE FUTURE RETAIL STORE: HOW IT WILL LOOK

To understand how a smart shopping cart system will be integrated into retail stores and work in a real environment, we need to find out first what are the customer touch points (the places that customers interact with the store) that most retail stores have today.

By analyzing the customer shopping process, we found out that the touch points with the store are:

1. Pre-store planning: Product, web site.
2. Outside store: daily deals, special offers -coupons.
3. In the aisle/at the shelf: self-scanning, in store navigation, calculation, follow the queue.
4. Checkout.



Figure 17. Retail touch points

5.1 Retail touch points

We will treat these retail touch points each one separately in next chapter customer journey through tablet computer enabled store.

5.2 Customer journey through the mobile-enabled store

I must admit that it is not easy task to explain exactly what the smart shopping cart system is, since it's a new innovation and needs lot of effort to understand well how it works in real environment.)

Therefore I will explain the idea by the help of an imaginary journey though the future store in order to understand how smart shopping cart system works in general.

1.Pre-store planning:

At home customers can:

- Plan in advance their shopping trip using their PC -tablet computer or Mobile phone
- Make their shopping lists by log into their account with store to upload them for their future shopping trip.
- Share their shopping lists with other member of family.
- Family member can also update their shopping lists by adding or removing items.



Picture 5.Example of shoping process

2 Outside store

Customers can:

- Get information about the daily deals



Picture 6. Showing daily offers

- Have additional information about the products that may influence their shopping trip such as recipes for instance
- Use the option of in store navigation

3-In the aisle/at the shelf

Customers can :



Picture 7. Tablet computer displaying product nutritional information

-Self scan products(prices . date of expiration nutrition)



- Get more information about product specification using self-scanning
- Calculate how much they have uploaded in their shopping cart.
- Search for product using in store navigation option.
- Participate in prize.

- Order products that are out of store.
- Browse store own recipes or from web.
- Follow the queue.



Picture 8. Self scan products(prices . date of expiration nutrition)



Picture 9. Follow-Me queue

- Follow the queue.

4-Checkout

At checkout customers:

- Can pay by using their store balance which means that every customer may open a bank account with their own store



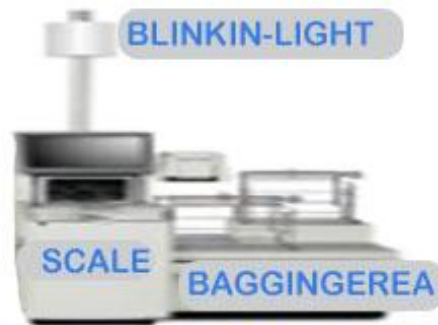
Picture 10. Example of Payment

or they can pay by using their own bank cards



Picture 11. Bank cards payment

- Self -check out :



Picture 12.Example of self-check out points

In addition to traditional cashiers, stores will be equipped with self-check out points, in this case customers will be in total control about their shopping process from the moment they enter to store until the moment they leave it.

With the help of smart shopping cart system it will be easy to use the service of self –check out since the shopping cart tablet computers will be equipped with different methods of payment (client balance, bank cards debit credit.) and with the help of magnetic card reader integrated in tablet computer and Wireless-netWork enabling both secure encryption capabilities, secure payments, and other transactions customers can painlessly pay for their purchased items.

In order to know in more details how self-check out works we should explain it step by step by doing so we could have a clear and big picture about how it will work.

1. Once the customer will arrive to self check out point he will chose from tablet computer option self service or self check out.
2. then he will begin to scan the items ,one at a time ,the tablet computer will retrieve product specifications and price .once the product will be scanned successfully customer might accept or reject the product. the customer will move the item to scale (The

weight observed on scale will be verified against previously stored information to ensure that the correct item is on scale , allowing the customer to proceed only if the observed and expected weights match which will measure its weight and send the measurement diameters to store server to see if the weight and the item specifications (in this case price) are the same if so a green light will be turn on and the item will move immediately via an automatic line to be loaded in bagging area which will be equipped with a locked storage box, if not a red light will be blinking the product (will be frozen) will stay in the scale and will not move forward to the bagging area.

Additionally ,the blinking red light will have another function which is calling a clerck grocery to the self check out point to assist , help ,and find out why the item(was frozen) did not move to bagging area.

The customer will repeat the same procedure with each item, On completing shopping, the shopper might select his preferred payment method on the device (, credit, debit,smart or store specific card , cash)– each self check out will have a Cash-Acceptor-Machine, coin slot



Picture 13.Example of Cash-Acceptor-Machine

3. ,each self check out point will be equipped with a wireless printer in case of the customer will want to have paper receipt as well this latest will communicate with tablet computer through bluetooth . once his payment will be accepted ,the locked box storage (bagging area) will be opened automatically and customer can pick up his purchased items.

6. HOW TO MAKE SMART SHOPPING CART SYSTEM A REALITY

6.1 Key drivers for technology adoption

I believe to complete technology package to support these application will be within reach of all consumers in couple of years .for to put our system into a real practice , the following drivers are fundamental .

A. Mobile Internet

The Internet has played a fundamental role to change the position of customers by giving them an easy access to a huge amount of information which was previously either hard to find or simply did not exist.

Why are for instance ecommerce sites such as Amazon, ebay very successful? Is it just simply because they have established an efficient order fulfillment mechanism online? The answer is yes but also we have to keep in mind that they have created new customer-generated content such as reviews about the products they sell.

In this context mobile internet opened the doors to the customers to access to the information they need and when they need it.

therefore the mobile industry's long term evolution strategy is to move broadband access which will support richer services.

B. Consumer Experience

It's a fact that customers' behavior changes every time when they have access to new technology which is easy to use.

What we mean here is that smart phone, tablet internet have a huge influence in our way of thinking and reacting.

By Creating a mobile device that it easy for customers to use where internet usage is central to experience.-smart shopping tablet concept is itself a mobile device attached to shopping cart –by using some of unlimited applications that already exist in mobile device whether they are android app , OS or windows and try to use them smartly in retail experience.

We as customers and retails will benefit from mobile technology.

7. CONCLUSION

There is huge potential to be gained by integrating mobile technologies into retail and specifically into in-store environments.

Using smart shopping cart as system including mobile phone, or internet tablet or smart cart will definitely change our way of shopping and speed up the shopping process.

It's true one cannot know exactly how a new system could work unless it will be tested in real environments in order to find out the potential bugs, what should be done more to improve it, what are the side effects on costumer in short term and long term? How retailers will benefit from this system economically without losing the most important element in shopping - being in direct touch with their customers and moreover offering the best customer service to their delighted customers.

Therefore we have to also think about and answer to all those questions above, not only to create a very good system but also the one which is humanize (human touch).

We should keep in mind as well that in order to develop an efficient system, it will need a real collaboration from all sides of this equation (retailers, Product Manufacturers, mobile operators and handset manufacturers).

I believe that smart shopping cart as a system will be an innovation that is able to be adapted according to the necessity of its own environment in order to satisfy the needs of both customers and retailers in almost perfect balance and harmony.

SOURCE MATERIAL

References

Birgit Mager.2008. Design Dictionary published by Birkhäuser, Basel URL:

http://uk.service-design-network.org/?page_id=257

DeSai, J. 2008. Mastering innovation: Roadmap to sustainable value creation

Edgett, 1994; The traits of successful new service development, Journal of Services Marketing, Vol. 8 No.

Edvardsson, 1997; Quality in new service development: Key concepts and a frame of reference, Int. J. Production Economics 52 (1997), Elsevier Science

Egils Milbergs& Vonortas.2008. Innovation Metrics: Measurement to Insight, Center for Accelerating Innovation2008, pp 2-3.

Fritillaria. 2010. Service design and the customer's journey [e-article]. Fritillaria

blog [cited on 27.4.2012]. Available at:

<http://fritillaria.blogspot.com/2010/04/service-design-and-customersjourney.html>.

Gube, J. What is User Experience Design? Overview, Tools and Resources [earticle].

UX Design. 2010 [cited on 13.4.2012]. Available at:

<http://uxdesign.smashingmagazine.com/2010/10/05/what-is-userexperience-design-overview-tools-and-resources/>.

Han, Q. 2009. Managing stakeholder involvement in service design: Insights

Johnson,Chase, Menor, Roth, 2000: Exploiting the service concept for service design and development. In: Fitzsimmons, J., Fitzsimmons, M. (Eds.), New

Service Design. Sage, Thousand Oaks, CA, pp. 71–91.

Mager.B.2008. Design Dictionary published by Birkhäuser, Basel.URL:

<http://www.service-design-network.org/intro/#sthash.lyYu6s1U.dpuf>

Maria Hayhow .2014. 6 Principles of Service Design to Help You Reach Your Customers. The Mos Blog. To brand/Brand awareness. URL:

<http://moz.com/blog/applying-service-design-online>

Milbers, E. & Vonortas, N. 2008. Innovation metrics: Measurement to insight [e-publication].

New York: IBM Corporation [cited on 15.4.2012]. Available

at: <http://www.innovationtools.com/pdf/Innovation-Metrics-NII.pdf>.

Morris, L. 2008. Innovation metrics: The innovation process and how to measure it. Walnut Creek: InnovationLabs LLC.

Moritz, S. 2005. Service design: Practical access to an evolving field [e-publication].

London: Stefan Moritz [cited on 2.2.2012]. Available at:

http://stefan-moritz.com/welcome/Service_Design_files/Practical%20Access%20to%20Service%20Design.pdf.

Shekar, 2007; An Innovative Model of Service Development: A Process guide for service managers, The Innovative Journal: The Public Sector Innovation

Journal Vol 12,2007.

Smith, H. 2005. What innovation is: How companies develop operating systems for innovation [e-publication]. Hampshire: CSC [cited on 15.4.2012].

Available at:

http://www.innovationtools.com/pdf/innovation_update_2005.pdf.

Stickdorn, M. & Schneider, J. 2011. This is service design thinking. Amsterdam:

BIS publishers.

RED 2005. Design process. Design Council URL:

[https://www.designcouncil.org.uk/sites/default/files/asset/document/ElevenLessons_Design_Council%20\(2\).pdf](https://www.designcouncil.org.uk/sites/default/files/asset/document/ElevenLessons_Design_Council%20(2).pdf)

Reichheld, F. 2006. The ultimate Question, Harvard Business School Press page117

Rogers E.M. 2008. Diffusion of Innovations, 4th Edition. Simon and Schuster.P79.

Shostack, G.L.,1984 ."Designing Service That Deliver", Harvard Business Review, page133

<http://www.empathica.com/customer-insights/>

Creating the Complete "End-to-End" Solution, Jan 26, 2006,
<http://www.kleverkart.com/html/strategic.html>

