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Inventory Ruptures of Continente Online – Sonae MC
Finding the Causes and the Solutions

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Dissertação

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Abstract

This study is an answer to Continente Online's (COL) need of finding the causes and the solutions for its inventory ruptures.

Inventory ruptures have a negative impact in customer satisfaction during service delivery and also reflect operational defects. The identification of the causes of inventory ruptures and the design of this problem's solutions is determinant for the creation of conditions for business growth sustainably.

To approach this research goal a service oriented, structured and mixed methodology was adopted, consisting in five sequential steps (Definition, Context Awareness, Measure, Analyze, Design Solutions) and all of them attempt to explore thoroughly the activities and conclusions of each phase. This methodology adapted Six Sigma for Services framework and included tools for the conceptualization and design of services: Service System Navigation and Service Experience Blueprinting.

To support and to provide a better vision of customer's service expectations, semi-structured interviews were performed to COL customers and their feedback allowed the design of solutions with direct impact in the customer's point of interaction - website.

This study helps to conclude that customer and service centric approaches are good for the identification of service points of failure and for the design of solutions that integrate critical processes or activities, determinant factors for the design and development of cohesive multi-channel service systems.

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1 Introduction

Worried with its customer satisfaction and loyalty, and also with its financial performance, Continente Online (COL), the e-retail service of Sonae MC, expressed its need to decrease the current percentage of inventory ruptures. This study is the answer to that expressed need.

The causes of COL's inventory ruptures were not particularly well-known inside the organization. To approach the problem, literature review and specially the chosen methodological approach were of great importance to find the causes, and the solutions for COL's inventory ruptures. The acquisition of a practical insight of the causes and the use of appropriate theoretical tools to design good solutions are the main objectives of this study, once its final goal is to provide COL with tools to improve their final aim: customer satisfaction.

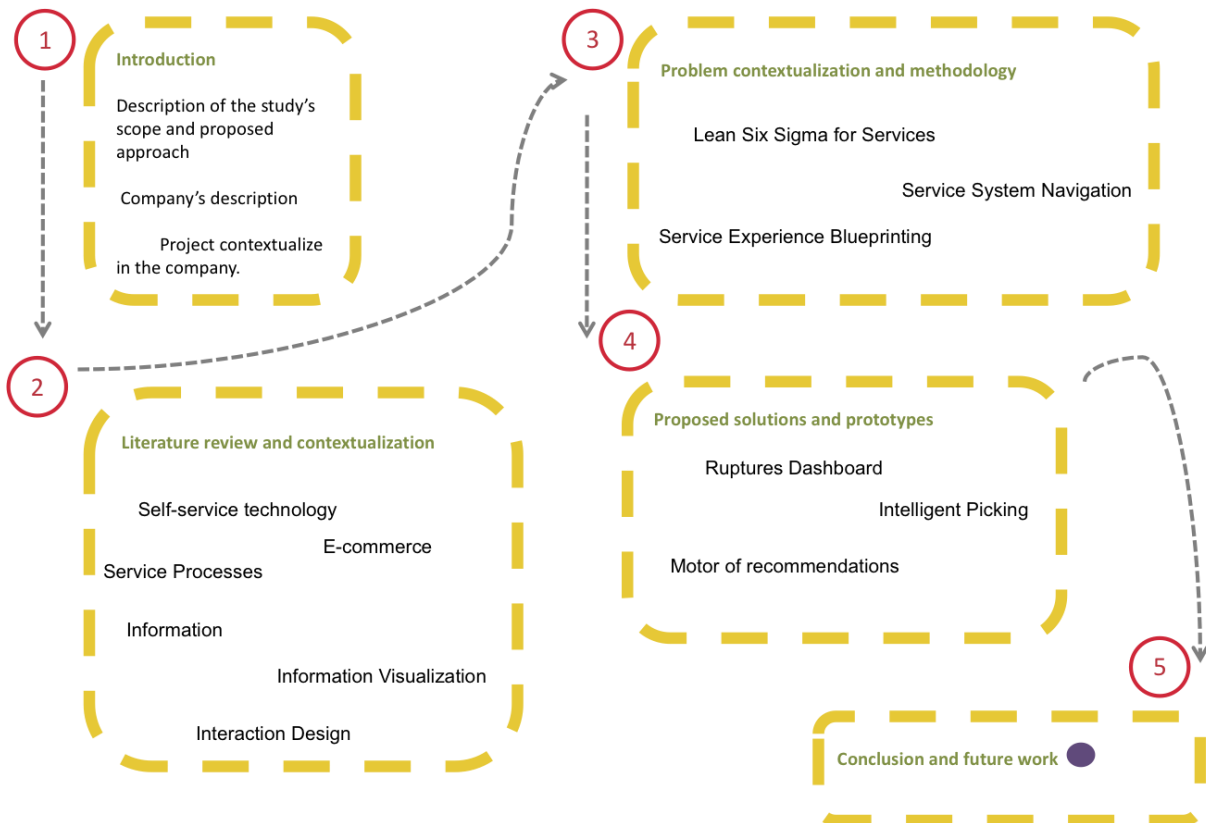


Figure 1. Representation of the document's organization.

This document's organization (Figure 1.) is analog to this study's overall approach to the problem, so first in the introduction section there is the firm contextualization and description.

The second section, Literature Review and Contextualization, frames the study within related research literature in several important fields of study. Subjects like e-commerce and self-service technologies, service processes, information, visualization of information and interaction design revealed to be very relevant for this study.

E-commerce and self-service technologies provide the business context and its future trends as well as the business model and customer service interaction mode contextualization.

As COL is an online service, its process design must be service oriented in order to meet customer expectations or even go beyond and design for customer delight. In this context tools like Service System Navigation and Service Blueprinting are referred, as well as the methodology of analysis of service processes – Six Sigma for Services.

Information is a very important resource and it needs as much development as the other and more traditional resources of an organization. Information as cohesive element of an organization as a tool for management decisions. Therefore the management of information assumes a huge importance along with the service processes in order to create a holistic vision for the design of an integrate solution for the presented problem. Similarly to the service processes, information management techniques, principles and methods for the visualization of information and design for interaction assume an important role for the design of solutions in this study.

The third section of this dissertation is the Problem Contextualization and Methodology, that describes in more depth the research questions this study intends to answer followed by the adopted methodology to answer them.

In order to answer effectively the questions of research, the approach of this research was designed using in one hand some principles of the Six Sigma for Services framework and, on the other hand, tools of service design: Service System Navigation and Service Blueprinting, making the adopted methodology a mixed methodology.

This study adopted the sequential, structured and quantitative nature of Six Sigma for Services framework. Define, Measure, Analyse, Implement and, for future work, Control are the steps used to find the causes and the solutions of COL's inventory ruptures.

The Define phase structured a definition of the problem. This step was then followed by a Context Awareness phase that provided a systematic vision of the processes. A customer's service system navigation was designed to understand the customer's interaction with the different service channels and to identify the service points of failure. Afterwards, the current processes related with those service points of failure were studied and designed to provide insight for the more quantitative part of the study - the measuring process.

The measuring process, from the Measure step of the methodology, collected data for the Analysis. After the Analysis phase, the ideas for solutions came up followed by the design of it in the Solutions Design step, similar to the Implement stage of the Six Sigma for services approach.

The representation and justification of the suggested measures of improvement come next, followed by the conclusions and future work directions.

1.1 Presentation of Sonae

Sonae, founded in 1954 in Maia with the goal of producing wood decorative laminates, expanded through a business strategic diversification in the 80's through the acquisition of a supermarket chain that resulted in launching the first hypermarket in Portugal – Continente of Matosinhos.

Currently, Sonae is the biggest private corporation in Portugal and defines itself as a retail company with two major partnerships in the shopping centers and telecommunications sectors. Its business areas have the following structure:

- **Core Businesses** represented by two sub-holdings that operate in retail (SonaeMC and SonaeSR);
- **Core Partnerships** with SonaeSierra (international specialist in shopping centers) and SonaeCom (telecommunications, media and information systems, and software area)
- **Related Businesses** through a recent business unit, SonaeRP, that manages the portfolio of retail real estate assets.
- **Active Investment** that supports the implementation of corporate and business strategy.

1.1.1 SonaeMC

Sonae MC is responsible for the food retail area of Sonae and is today leader of the food retail market in Portugal with a number of distinctive formats, which offer a varied range of products such as: Área Saúde (para-pharmacies), Bom Bocado (restaurants), Book.it (book shop/stationery), Continente (hypermarkets) and Modelo (supermarkets).

1.1.2 Modelo.com

Modelo.com is responsible for the launching, management and operations of Continente Online. Continente Online (COL) is the e-commerce service channel of food retail of Sonae MC and encompasses all the inherent operations of an e-commerce/e-retail business model: web-based ordering, credit, invoice and delivery functions; picking and delivery operations; and marketing, catalog management, order entry, and order delivery business applications.

Modelo.com is also responsible for the management and operations of the home delivery service of Continente brand.

COL was launched in the year 2000 to meet the e-commerce trend on retail and operates in fifteen Continente physical stores strategically chosen by its geo-demographic area of influence: Metropolitan area of Lisbon and Porto, Portimão (to reach the most important demographic areas of the Algarve), Coimbra, Covilhã, Leiria, Guimarães and Viseu.

1.2 Project contextualization in Modelo.com

During the last ten years COL has been one of the main responsables for establishing of the e-retail business in Portugal, and is considered one of the most recognized brands in the market for this type of service provision. COL was the pioneer in the adoption of this type of self-service technologies for food retail in Portugal, and its current ambition is to target more customers and increase its sales volume. To accomplish this ambition COL aims to improve its service operations and grow sustainably.

This project meets one of Modelo.com needs of operational and customer satisfaction improvement process in order to accomplish COL's ambition of sustainable growth.

The need that this Project approaches is Modelo.com's need to lower COL's percentage of inventory ruptures once it impacts negatively its relationship with customers and mirrors operational defects that are reflected in: costs related with potential lack of customer loyalty (what it is delivered it is different from the expected) and costs related with operation ineffectiveness and inefficiency.

2 Literature review and Contextualization

Services are a rising if not a dominant force in many economies today (Ricketts, 2008). Despite this rise of services, the services management field is still based largely on foundations that can be traced back to the industrial era. Where there are clear parallels, such foundations are a natural fit. But as the services sector has grown in size, it has also grown more diverse, more distributed, and considerably more complex. Enterprises in the services sector now face challenges – and opportunities – that have no clear precedents in industry. (Ricketts, 2008).

The e-retail service is a for-profit business, that has labor as a primary input and service as primary output. Educational degrees are generally required, does not rely on machines, materials or facilities, with low customization for specific customers, high repeatability of processes, delivery requires contact with the consumer and there is no inventory of the service (Ricketts, 2008).

2.1 E-commerce and Self-Service Technology

According to the Information Economy Report 2007-2008, the application of Information and Communication Technologies (ICT) to financial, manufacturing and marketing and distribution activities has helped enterprises to become more efficient through process innovations, and it resulted in the emergence of entirely new products or services. E-commerce is one of the services that resulted from the application and development of ICT for business use and it is definitely in the interests of Self-Service Technologies (SST's)-introducing firms to shift significant portions of consumer behavior to their automated service technologies as rapidly as possible. The fixed cost of establishing these technologies is often quite high, and the savings come largely from labor-reduction. If the adoption process is slow, the firm has to keep its labor force intact as well as to pay for the cost of the technology. Where the speed of adoption of these new technologies can be increased, firms of introducing them to customers can reap large benefits (Lee et al., 2002). The introduction of SST's to the delivery of a service removes the provider's personnel from the transaction, and places additional responsibilities on the customer to transact the service. Although changes in the service delivery are supposedly made to benefit the customer, they often require increased

work or involvement on the part of the customer. These and other factors may preclude the customer from trying or using technology (Langeard et al., 1981).

The replacement of human service by a technology usually requires both the development of new knowledge and behavior associated with the service and increased customer participation and responsibility in the production of the service (Lee et al., 2002). One strategy which appears to have significant potential to speed the adoption of a new self-service technology may involve marketing efforts aimed at heightening the customer's perception of personal control over the service encounter. The underlying theories of personal control maintain that a person's perception of risk, stress, satisfaction and well-being in dealing with an uncertain environmental event is significantly influenced by his/her perception of control over that event (Lee et al., 2002).

Portugal, according to Europe's Digital Competitiveness Report (2008), is one of the EU countries with the lowest rates of regular and frequent Internet users resulting in a low usage of services online. Despite of this, Portugal is one of the best EU states in terms of provision of online public services and is among the leading countries for enterprises' implementation of e-business application with almost every indicator exceeding EU average, where the contribution of e-commerce to total turnover is equal to EU average.

All this investment around digital presences of services, encourages users to become more regular and frequent in the usage of online services.

According to Observador Cetelém (2010) the current consumers of online shopping in Portugal perceive internet as a privileged mean to seek the best cost-benefit relationship and online consumers have well structured online shopping criteria and preferences in terms of shopping categories.

Accordingly with Observador Cetelém, the criteria of online shopping behavior, the online shopping categories by descendent order and the intention of online shopping are represented in Figure 2. and Figure 3., respectively.



Figure 2. Representation of the hierarchization of the criteria of online shopping behaviour.

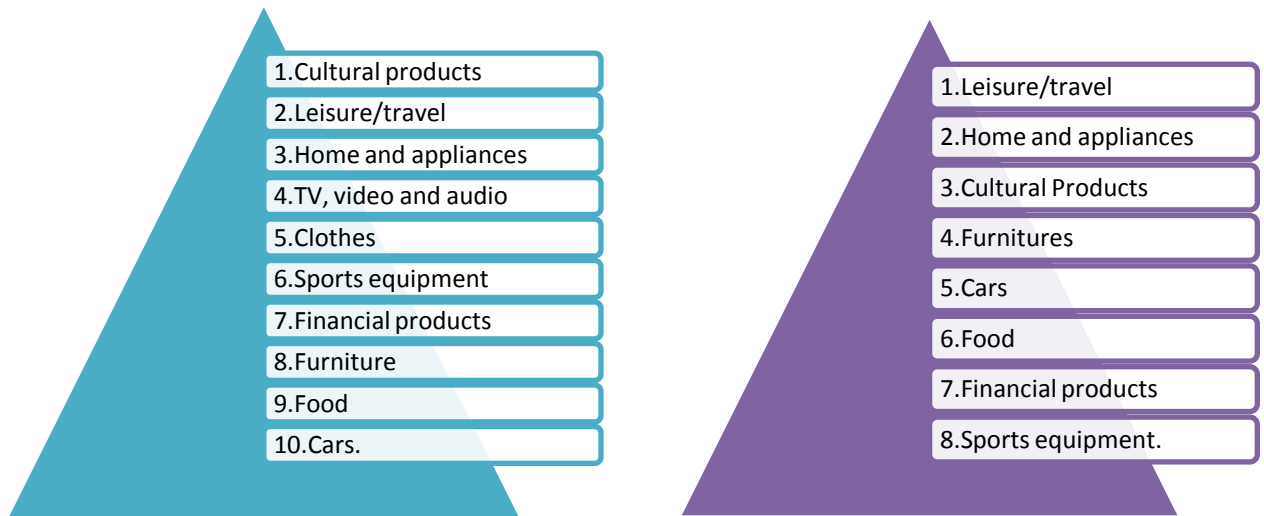


Figure 3. Representation of the hierarchization of the online shopping categories on the left and the intention of online shopping on the right.

All signs indicate that e-commerce has room to grow, especially food retail, and this means operations efficiency and effectiveness must be refined to improve service capacity and customer satisfaction.

2.2 Service Process

According to Edvardsson et al. (2000) critical service encounters are an important input when developing new services, and the repetition of the same mistake over and over again must be avoided, instead, incidents related with customer delight must be learned and removed. This may be seen from two perspectives; one is to arrive at defect-free new services, the second is to design-in prerequisites for customer delight. Service is a customer process because it is produced in a process that may be viewed as the service product. This differs from the production of physical products, as the customer often is a co-producer in the production of services. Customers participate actively or passively carrying out different activities. These activities compose the customer process and are part of the overall service process. This process can be divided into a technical part, meaning activities carried out by machines, computers, etc., and a part, including activities where the staff is supported by technical processes and systems (Edvardsson et al., 2000).

The service process could be described as a chain or chains of parallel, sequential, overlapping and/or recurrent activities, which are necessary if the service is to be put into practice. As a result of the fact that the process partly consists of activities at customers' or partners' premises, the company does not have direct control over all parts of the process. Nevertheless, the service company needs to be able to control the entire process (Edvardsson et al., 2000). Four process categories have been identified. These are (1) core processes, (2) support processes, (3) network processes that involve the organization as well as its suppliers, customers and allies, and (4) management processes that consist of the company's tools or processes for planning, organizing and controlling the resources (Earl and Khan, 1994). To function effectively for the client, the entire sequence of activities should be coordinated and managed as whole, over time, with emphasis on including the resources and steps that produce value for the customer (Bitner et al., 2008).

Service blueprinting (SB) is a customer-focused approach for service innovation and service improvement, allowing firms to visualize the service process, points of customer contact, and the physical evidence associated with services from their customers' perspective. Blueprints also illuminate and connect the underlying support processes throughout the organization that drive and support customer-focused service execution. It is a powerful technique that can be used to depict a service at multiple levels of analysis, as it facilitates the

detailed refinement of a single step in the customer process as well as the creation of a comprehensive, visual overview of an entire service process (Bitner et al., 2008). More recently, the Service Experience Blueprint (Patrício et al., 2009) has adapted and added Goal Oriented Diagrams (Mylopoulos et al., 1999) to better incorporate customer experience requirements into the design of the service process, and has incorporated elements of the Unifying Modeling Language (UML) (Booch et al., 1999) to better integrate the work of service designers and software engineers that design the technology solutions that support the service process (Patrício et al., 2009).

The Service System Navigation (SSN) maps the alternative paths customers may take across the different channels along the tasks of service experience. The SSN therefore offers a dynamic view of how the service system enables customers to co-create value (Patrício et al., 2009). SSN also provides a dynamic view of the service system, supporting the design of service interface (Patrício et al., 2009).

The six sigma methodology for service processes is a problem solving methodology or process improvement framework and its strategy makes use of a series of well defined steps: (D) problem definition, (M) measurement of the problem (i.e. defects which are responsible for the problem), (A) data analysis, to discover the root causes of defects, (I) improvement of processes to remove the root causes of defects and (C) controlling or monitoring processes to prevent the perennial problem (Antony, 2006). The Basic goal of a six sigma strategy is to reduce variation within the tolerance or specification limits of a service performance characteristic. In order to improve the quality of a typical service, it is imperative to measure or quantify variation and then develop potential strategies to reduce variation. The focus must be on four issues (Antony, 2006):

1. What is the nature of the defects which are occurring in the process?
2. Why are such defects occurring and at what frequency?
3. What is the impact of defect on customers?
4. How can these defects be measured and what strategies should be implemented to prevent their occurrence?

Associating a visual and integrative tool with a well-structured and quantitative methodology allows to identify where in the service process are causes of service failure and what impact those causes have. Therefore it is possible to prioritize which service failure causes must be improved and how the firm's resources shall be allocated for that purpose.

2.3 Information

Nowadays every aspect of management relies heavily on information. It is a very important resource and it is needed to develop other resources, therefore information needs to be managed like any other resource in an organization, to ensure its cost-effective use. According to Adeoti-Adekeye (1997), to realize this implicates the recognition that information is the cohesive element that holds an organization together and since it is intangible, it is crucial to highlight the significant differences between this resource and others when developing a management framework.

The organization's internal information must be of interest and value to decision makers, once, according to Stonecash (1981) information is the raw material for making decisions for creating knowledge and fuelling the modern organization.

Information management is of great importance once it is responsible for the creation, maintenance, retrieval and on-time availability of reliable information for the right people, at the lowest cost, and in the best media. To accomplish this it is inevitable to know the organization's structure, processes and culture in order to know how, when and what information must be delivered. Finally, an information system may be designed as a system that accepts data of interest as raw material and through one or more transmutation processes, it will deliver information. According to Adeoti-Adekeye (1997), an information system must comprise the following functional elements related to the organization and its environment:

- *perception* - initial entry of data whether captured or generated, into the organization;
- *recording* - physical capture of data;
- *processing* - transformation according to the "specific" needs of the organization;
- *transmission* - the flows which occur in an information system;
- *storage* - presupposes some expected future use;
- *retrieval* - search for recorded data;
- *presentation* - reporting, communication; and
- *decision making* - a controversial inclusion, except to the extent that the information system engages in decision making that concerns itself.

One approach by which organizations can utilize computing capability is through the development of Management Information Systems (MIS). The concept of "management

information system” can be seen as a database management system tailored to the needs of managers or decision makers in an organization. MIS is a system using formalized procedures to provide management at all levels in all functions with appropriate information based on data from both internal and external sources, to enable them to make timely and effective decisions for planning, directing and controlling the activities for which they are responsible (Argyris, 1991). , and in essence, the processing of data into information and communicating the resulting information to the user is the key function of MIS.

Planning, directing and controlling are the essential ingredients for “management” and there are clear differences in information requirements between a manager at the operational or transactional level, such as a transport supervisor, and a manager at the tactical level, such as accounts or sales manager, or at the strategic level, such as managing director/board of directors. At the highest (strategic) level, structured, formal MIS may actually be counter-productive, for at these levels informal MIS and external influences become increasingly important. Another factor which affects the tasks a manager has to perform, and hence his or her information requirements, is the extent of functional authority within an organization. Functional authority is that which is exercised by specialists, managers and staff throughout the various departments and units of the organization (Adeoti-Adekeye, 1997).

In order to provide appropriate information, designing a MIS requires the awareness of the types of decisions at the various levels of the organization. A useful classification is the one given by H.A. Simon who classified decision making into programmed and non-programmed. Programmed decisions are those that are routine and repetitive and where decision rules are known. Conversely, non-programmed decisions are novel and unstructured and the nature of the problem and decision rules are complex and little understood. It follows from these brief descriptions that radically different information and procedures are required for the different decision types, which have obvious implication for MIS design (Adeoti-Adekeye, 1997).

This means that a MIS must be designed with due regard to the types of decisions, how decisions are taken, how the decision makers relate to the organization, the nature of the organization, its environment and so on (Adeoti-Adekeye, 1997).

2.4 Information visualization

This section is inspired by the work and research of Edward Tufte in techniques for Information Visualization that are based in one very clear question: why some displays are better than others.

To envision information - and what bright and splendid visions can result - is to work at the intersection of image, word, number, art (Tufte, 1998).

The way information is presented is of high importance once it influences how the information is perceived and hence it allows the acquisition of insight.

According to Robert Spence, visualization is a human cognitive activity, not something that a computer does. Therefore, Chaomei Chen, editor-in-chief of Information Visualization claims, information visualization can be broadly defined as a computer-aided process that aims to reveal insights into an abstract phenomenon by transforming abstract data into visual spatial forms. The intention of information visualization is to optimize the use of our perceptual and visual-thinking ability in dealing with phenomena that might not readily lend themselves to visual-spatial representations.

Visualization aids cognition not because of some mystical superiority of pictures over other forms of thought and communication, but rather because visualization helps the user by making the world outside the mind a resource for thought in specific ways. Visualization amplifies cognition by (a) increasing the memory and processing resources available to the users, (b) reducing search for information, (c) using visual representations to enhance the detection of patterns, (d) enabling perceptual inference operations, (e) using perceptual attention mechanisms for monitoring and (f) by encoding information in a manipulable medium (Gershon et al., 1998).

Information visualization is not just about the creation of visual images, but also about the interaction with those images to solve some problems, as represented in Figure 4. It is the rapid reciprocal reaction between the generation of images by machines and the selection and parametric adjustment of those images, giving rise to new images that gives rise to the attractive power of interactive information visualization.

Another definition of information visualization is the use of computer supported, interactive, visual representations of abstract data to amplify cognition (Card et al., 1999).

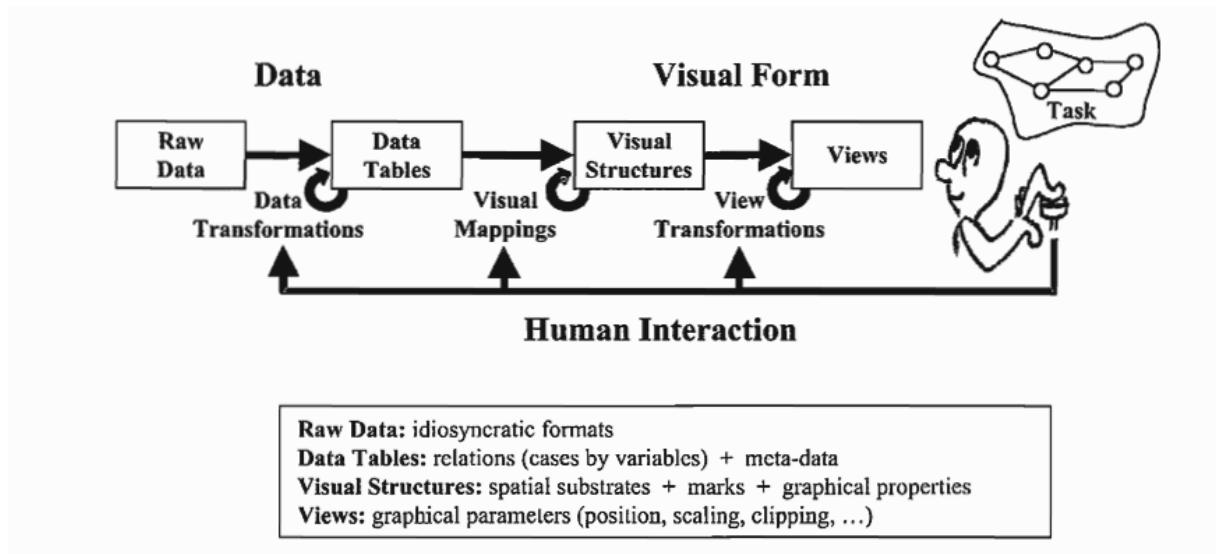


Figure 4. Reference model for visualization (Card et al., 1999).

Information visualization deals with new classes of data and their associated analytical tasks in business and information technology areas. Information visualization combines aspects of scientific visualization, human-computer interfaces, data mining, imaging, and graphics. In contrast to most scientific data, information visualization focuses on information, which is often abstract. This fundamental difference means that many interesting classes of information have no natural and obvious physical representation. A key research problem is to discover new visual metaphors for representing information and to understand what analytical tasks they support (Gershon et al., 1998).

According to Card et al. (1999) the techniques for information visualization are:

- An overview of the information's structure;
- Dynamic queries, in which the visualization seems to change instantaneously with control manipulations;
- Zooming by restricting to the set of interest;
- Details on demand, in which the user can display temporarily detail about an individual object;
- Retrieval by example, in which selected attributes of an individual object are used to specify a new retrieval set.

For this study it is important to highlight the dynamic queries as it is a general paradigm for visualization interaction that enables the user to visualize data and set of controls and subsets of the Data Table can be selected (Card et al., 1999).

2.5 Interaction design

Interaction design is also important once it creates user experiences that enhance and extend the way people work, communicate and interact. Interaction design concerns the understanding of the kind of activities people are doing when interacting with the interface and studies different kinds of interfaces and arrangements of input and output devices that best suit what, who and how it is being used (Preece et al., 2002).

In order to accomplish these goals, a design methodology is of great importance. Maeda, in Laws of Simplicity, inspired by his long work with technology, states that “Technology has made our lives more full, yet at the same time we’ve become uncomfortably ‘full’.” Inspired by his experience he defined the Ten Laws of Simplicity with the mission of: *define the business value of simplicity in communication*, once the structure of the technology business sells the same thing “new and improved” where often improved means more (Maeda, 2006). Simplicity is a quality that not only evokes passionate loyalty for a product design, but also has become a key strategic tool for business (Maeda, 2006).

The Ten Laws of Simplicity are:

TEN LAWS

- 1 REDUCE** The simplest way to achieve simplicity is through thoughtful reduction.
- 2 ORGANIZE** Organization makes a system of many appear fewer.
- 3 TIME** Savings in time feel like simplicity.
- 4 LEARN** Knowledge makes everything simpler.
- 5 DIFFERENCES** Simplicity and complexity need each other.
- 6 CONTEXT** What lies in the periphery of simplicity is definitely not peripheral.
- 7 EMOTION** More emotions are better than less.
- 8 TRUST** In simplicity we trust.
- 9 FAILURE** Some things can never be made simple.
- 10 THE ONE** Simplicity is about subtracting the obvious, and adding the meaningful.

Figure 4. Ten Laws of Simplicity (Maeda, 2006)

Also important in the interaction design are its goals concerning usability experience.

The usability goals concern (Preece et al., 2002):

- Effective to use;
- Efficient to use;
- Safe to use;
- Have good utility;
- Easy to learn;
- Easy to remember how to use.

And the user experience goals concern (Preece et al., 2002):

- Satisfying;
- Enjoyable;
- Fun;
- Entertaining;
- Helpful;
- Motivating;
- Aesthetically pleasing;
- Supportive of creativity;
- Rewarding;
- Emotionally fulfilling.

In order to design interactive interfaces, a structured methodology is of high importance. The process of designing users interaction has 4 steps:

1. Identification of the users needs;
2. Conceptualization of the system;
3. Prototyping;
4. Evaluation.

3 Problem Contextualization and Methodology

3.1 The Problem

The problem that this study approaches is related with inventory ruptures in Continente Online (COL). Inventory ruptures reveal on one hand process inefficiency and on the other hand have impact on customer service satisfaction and loyalty, once the online ordering not always matches what is delivered.

Being aware of the importance of this problem and in order to contribute to the growth and sustainability of COL business, this study's first aim is to find:

- Where in the service processes are the causes of inventory ruptures in COL?
- Who in the service processes is causing inventory ruptures?
- What product categories have more inventory ruptures?
- How do the inventory ruptures behave during the different order picking shifts?
- How do the ruptures impact customer's service satisfaction?

The second goal of this study is to analyze all the data resultant from answering these questions, prioritize measures of intervention and design solutions for these prioritized measures.

To accomplish these two objectives the adopted methodology has the following goals:

- Structure the study;
- Acquire insight on the problem;
- Match the needs of the problem with the design of solutions.

3.2 Methodology

The adopted methodology is a mix of Six Sigma for Services with Service System Navigation and Service Blueprinting tools in a continuous process improvement perspective. In a high definition level Figure 5. represents the main steps of the framework of this study.

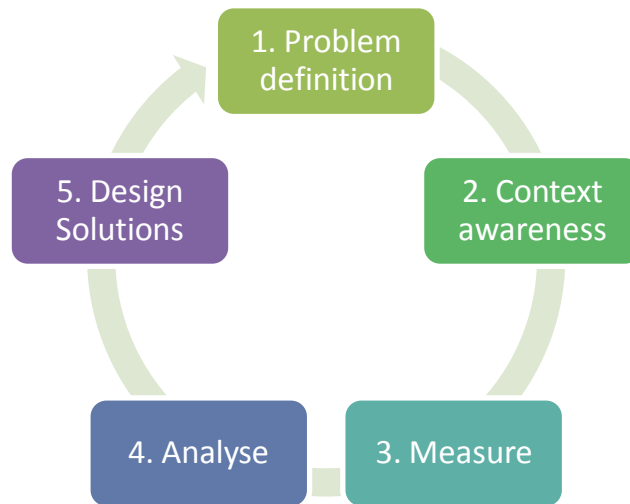


Figure 5. Representation of the methodology's dynamic and its steps.

1. Problem definition

In order to evaluate the problem, the scope of it must be well defined. To accomplish that the step one of Six Sigma for Services was taken into account: Define.

Inventory rupture is: *The non delivery of an item originally ordered by the customer.*

2. Context Awareness

To acquire insight of the problem two perspectives are necessary: processes and information, and customer feedback. To acquaint those perspectives a Service System Navigation was designed (Figure 6.) in order to find where in the service are the potential points of failure. The semi-structured questionnaire represented in Figure 13, was designed to get customer's feedback and perception of the inventory ruptures, once COL did not have customer information regarding this matter. Customer's feedback and insight is a key factor for the understanding of how to design a solution and how much it should be invested on it, because it provides, from the customer's perspective, the level of importance of the problem.

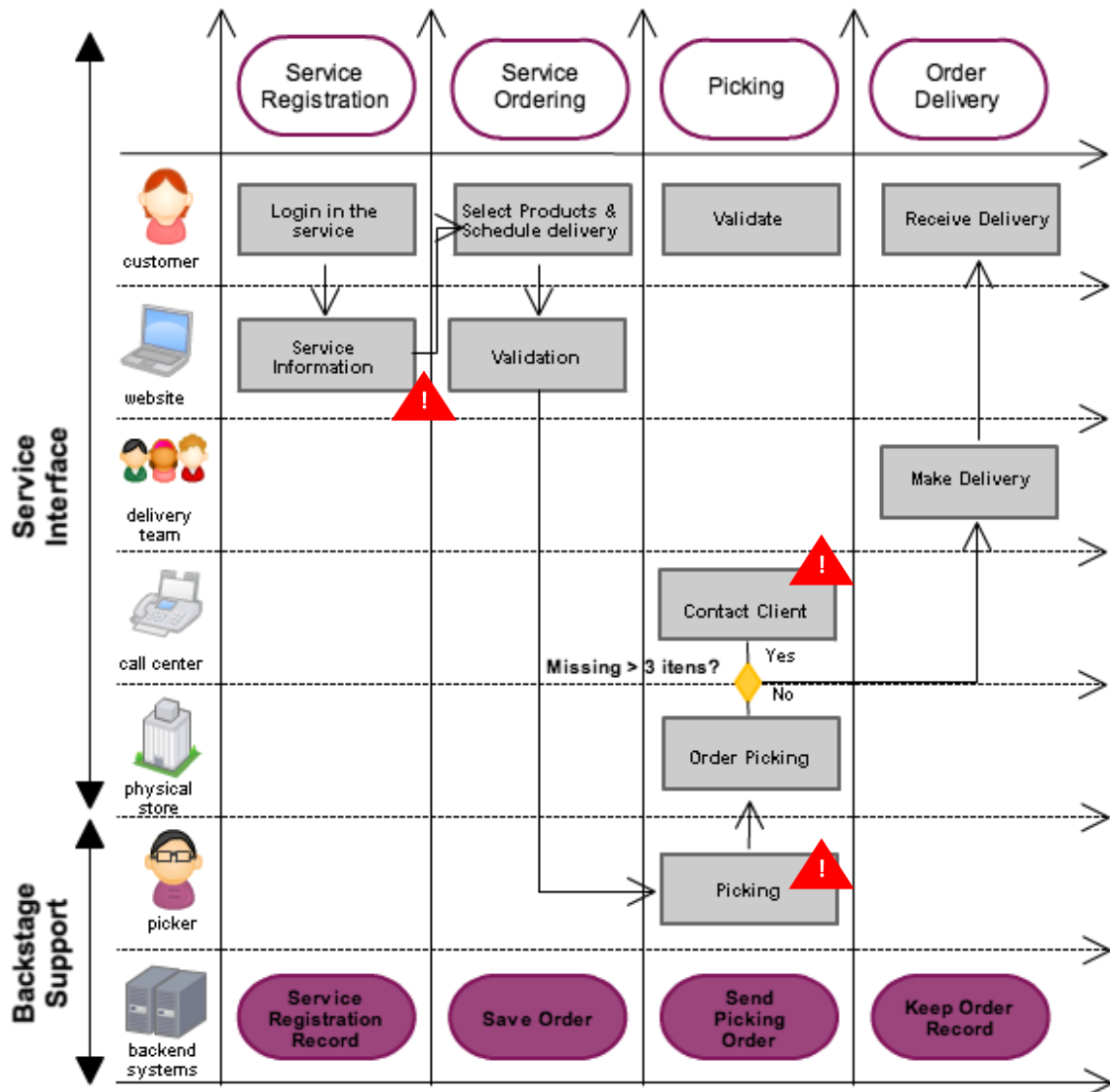


Figure 6. Service System Navigation that represents the service interfaces and processes in the moment of online ordering and its service failure points.

The Service System Navigation (Figure 6.) allowed then to design in what context should the problem measuring be performed, as it was visible that inventory ruptures had to be related with information provided by the website and had to be related with the picking process and its diverse intervenients. To be aware of the process related with inventory ruptures and with information, picking and support processes from upstream to downstream, the scope and context of the study evaluated:

- In-store picking process;
- In-store replenishment;
- Information related with the items in rupture in COL contained in the Information System specially customized for SonaeMC – Retek;
- Website item status.

After defining the processes that should be analyzed, process awareness was needed to develop a good analysis, so this phase was followed by the process and information flux procedures, such as: (a)picking process (Figure 7.), (b)picking of ruptures (Figure 8.), (c)logistics information flux (Figure 9.) and (d)website's integration of items information (Figure 10).

(a)Picking Process

The picking process is triggered after a customer validates its online ordering. The order record is saved in the backend systems and sends the information to the picking in-store team backoffice system. The picking notes are then downloaded to a PDA used by the pickers to support the picking process. The PDA's provide the information related with the items that must be picked in-store and also allow to regist and manage the ruptures along the picking process. If after picking a customer's order there are more than 3 items in rupture, the picking team responsible contacts the customer suggesting substitution items that may or may not validate those suggestions. If validated, the substituted items are included and will complete the order .

The picking process in Matosinhos physical store is divided by three shifts: morning, afternoon and night and takes place in the day prior to delivery:

- The morning shift picking takes place from 01:00PM to 03:00PM;
- The afternoon shift picking is from 03:00PM to 06:00PM; and,
- The night shift picking takes place from 06:00PM to 09:00PM.

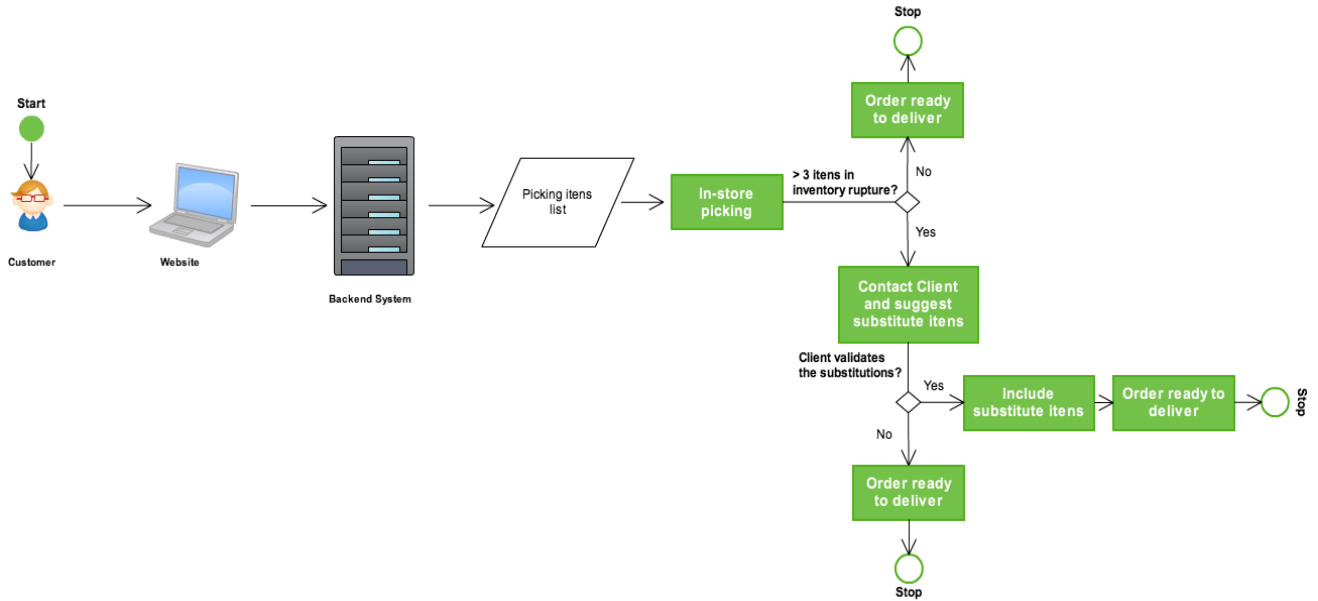


Figure 7. Picking process.

(b) Picking of ruptures

The picking of ruptures basically consists in a second round of picking. This second picking round exists because the number of ruptures after the first round is usually high and also because contacting all the customers that have incomplete orders is a high-maintenance process in terms of time management, costs and actually there are customers that do not appreciate to be contacted and that do not have the availability to help the picking team to decide the substitutions.

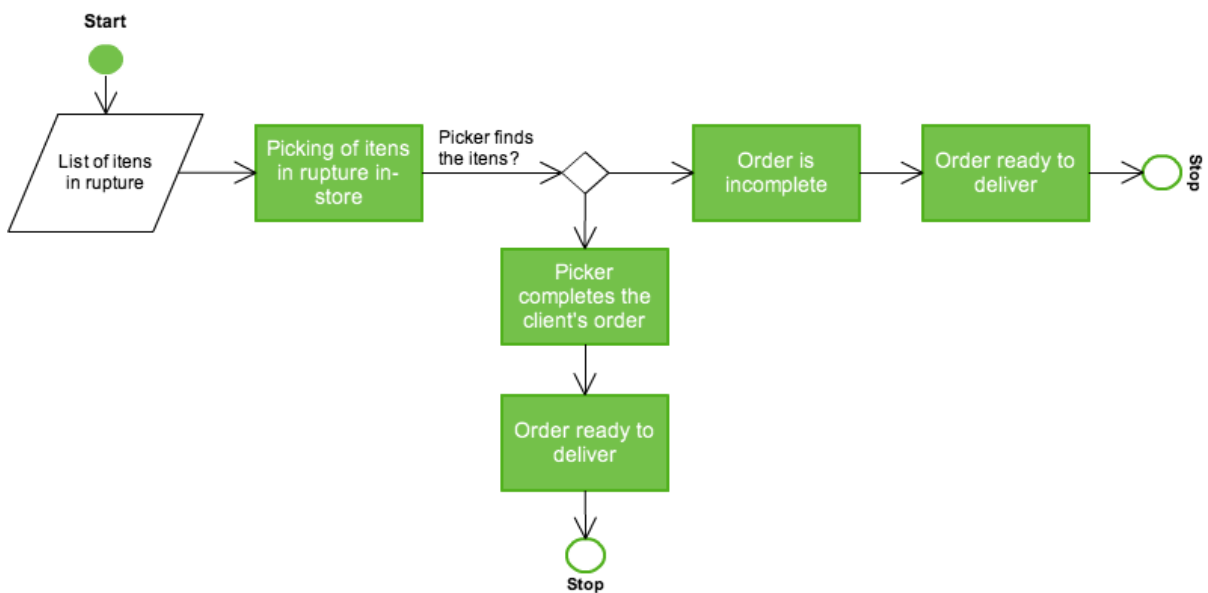


Figure 8. Picking of ruptures process.

The Picking of Ruptures takes place during the morning of the delivery day with the following schedule:

- For the morning deliveries shift - 07:30AM to 09:30AM;
- For the afternoon deliveries shift - 09:30AM to 11:30AM;
- For the night deliveries shift - 11:30AM to 01:30PM.

(c) Logistics information flux

The products and product range available in COL is decided by the commercial direction. The commercial direction is responsible for negotiating with potential suppliers and decide which products are kept, included, suspended or discontinued. This information is then integrated in the information system – Retek. Taking into account the service level agreements (SLA) of the suppliers and the stock information of the stores, the commercial management is responsible for the replenishment of the distribution centers but only for top rotation products that are not integrated via EDI. The physical stores are responsible to update their stocks levels on Retek, and also to indicate on Retek the orders they launch to their own suppliers, as each store has its own customized product range. The replenishment of the physical stores also consult Retek to know when and what must be ordered, having in account their stock information and also to know if the commercial direction changed the status of the products. The products available online are a result of the stock of the stores where the COL operates and also depend of the status of the product. Figure 9. represents the logistics information flux.

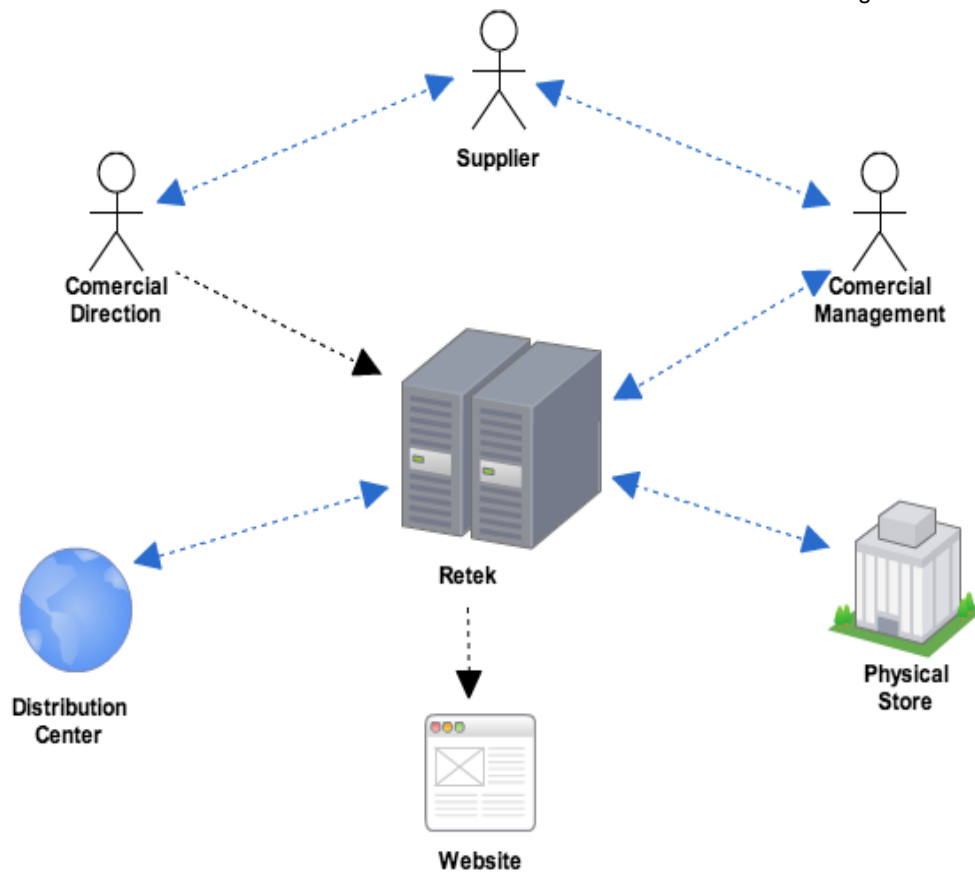


Figure 9. Representation of the logistics information flux of Sonae MC.

(d) Website's integration of information

The information related with the items available to buy online is replicated following the process represented below in Figure 10. The information that is replicated follows some general rules:

- The value of stock-on-hand (SoH) of the product at Retek cannot be in the $(-5;5)$ interval. This rule was adopted by COL once statistically the items that have SoH values between -5 and 5 were actually 0 SoH;
- The status of the product related with the comercial management (Gama Loja Real - GLR) has to be Active;
- If the status managed by the comercial direction is: For Promotion, Suspended or Discontinued, the item cannot be sold;
- If the status managed by the comercial direction is: Promotion, this means that the item must be sold under a different EAN code.

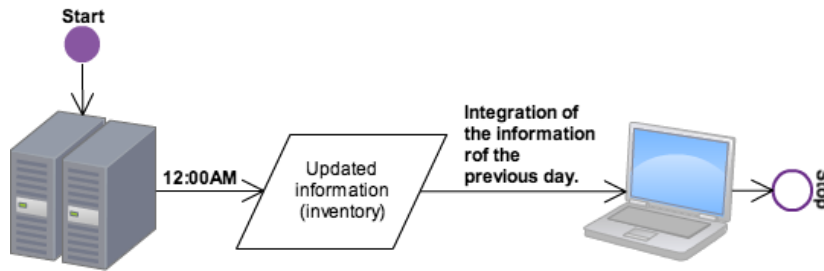


Figure 10. Process of integration of inventory information in COL website,

3. Measure

After the processual contextualization, the measuring process took place, step two of the Six Sigma for Services Framework. The measuring process is represented in Figure 11.

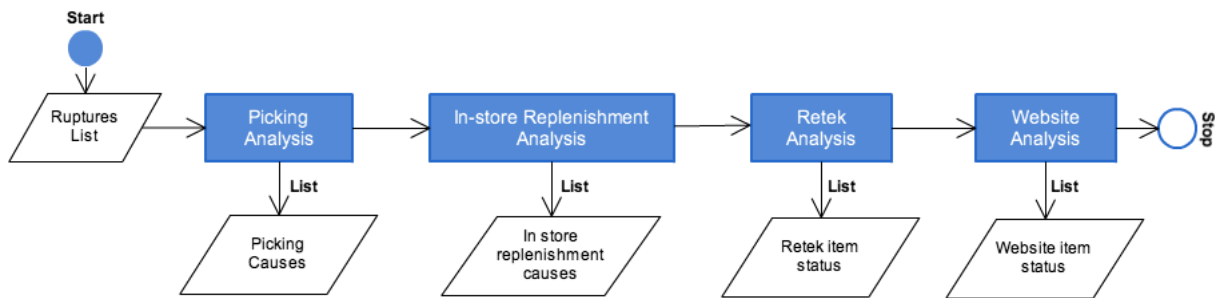


Figure 11. Process of measuring adopted in this study.

As represented in Figure 11. the measuring process consisted in going to the COL picking in-store operation and collect the list of ruptures immediately after each shift of picking of ruptures (morning, afternoon and night). Afterwards and after each shift, the store would be walked, just like the pickers do, and it would be checked aisle by aisle if the products were in shelf or not, checking if the EAN code matched with the ordered code, checking the on-shelf tag information (i.e. No stock, for example), if the product image changed or if the product location was different from the day before.

Immediately after collect the in-store data, data would be collected from the store replenishment operation, next to the responsables for the management of each product categories.

After these previous steps, data related with comercial direction product status, comercial management product status, store product status and store's stock on hand value would be collected from Retek for each item figuring in the List of Ruptures of each shift.

These steps were followed by the verification of the website product status for each item in rupture at the online shopping day.

All this data would be registered daily in a table design for the measuring process.

All these steps allowed what caused the ruptures and where in the process were located the service points of failure, as indicated in the following phase of the study.

Regarding customer's feedback, the data was collected following the approach represented by Figure 12. This approach aims to understand the customer's overall satisfaction with COL's service and contextualize the impact of the inventory ruptures in the global service satisfaction.

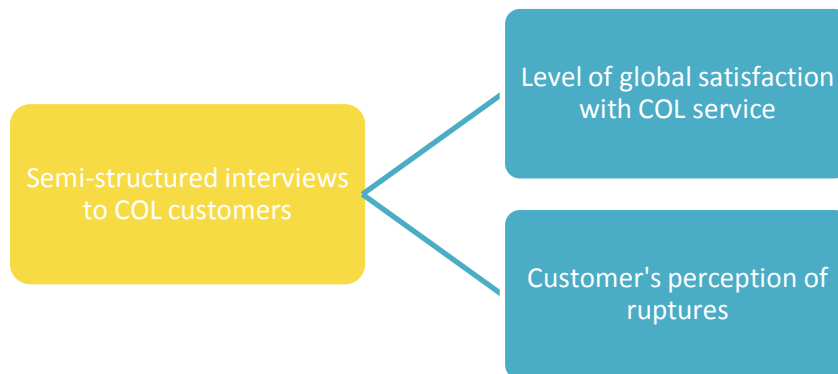


Figure 12. Representation of the methodology adopted to analyze customer's perception of ruptures.

Though the approach represented in Figure 12. is very structured, the interviews were semi-structured, as the goal was to collect qualitative data and put the customer as a high-level participant in the design of solutions, inspired by Scott Cook's (2008) *The Contribution Revolution - Letting Volunteers Build Your Business*. To perform the interviews a script supported the semi-structured interviews and is represented in Figure 13.

Script for the semi-structured interview performed to COL customers:

- In a scale from 1 (not satisfied) to 5 (very satisfied), what is your level of satisfaction with COL service delivery?
- Have you been receiving your online orders complete?
- If you have experienced an incomplete order, what do you think COL should have done?
- In case you have already experienced the delivery of an incomplete order, what do you suggest to COL to overcome this problem?

Figure 13. Script of the semi-structured interviews that were performed to COL customers.

4. Analysis

After the measure phase, the analysis phase was performed, consisting in:

- processual analysis; and
- customers perception acquaintance.

Processual Analysis

The processual analysis, described in Figure 11., lasted twenty six days and it took place in COL's operation in Matosinhos store.

During the period of analysis, 602 ruptures were analyzed in a total of 904 ruptures that occurred in the sampling period of time. This corresponds to 67% of analyzed sample versus 33% of not analyzed sample.

In Table 1. the summary of the main causes of rupture are represented in descendent order of importance.

Causes	#	Weight (%)	%
¹ Code asynchrony	163	18,0	0,74
² Replenishment Failure	122	13,5	0,55
³ Item in-store	79	8,7	0,36
⁴ Restitution asynchrony	66	7,3	0,30
⁵ Stock-out	50	5,5	0,23
⁶ Insuficient in-store items	24	2,7	0,11
⁷ Discontinued	19	2,1	0,09
⁸ Suspended	14	1,5	0,06
⁹ Wrong stock amount	14	1,5	0,06
Other causes	51	5,64	0,23
Not analyzed	302	33,4	1,37
Total	904	100,0	4,10

Table 1. Summary of the most important causes of inventory rupture.

Table 1. summarizes the causes of rupture that were detected through the measuring process (Figure 11.). In more depth, Figure 13. represents the weight that each process intervenient had in the causes of rupture, regarding the data from Table 2., Table 3., Table 4. and Table 5.

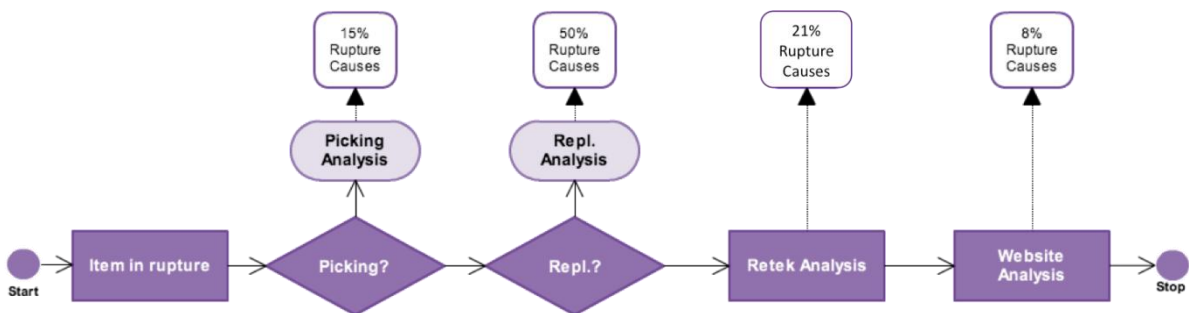


Figure 13. Representation of the weight of each process intervenient regarding the causes of rupture.

Replenishment	#	Weight (%)	%
Replenishment failure	122	13,50	0,55
Restitution asynchrony	66	7,30	0,30
Stock-out	50	5,53	0,23
Insuficient in-store items	24	2,65	0,11
Wrong stock quantity	14	1,55	0,06
⁹ In transit	13	1,44	0,06
¹⁰ Unknown location - warehouse	11	1,22	0,05
In-store shelf space	4	0,44	0,02
Total	304	50,50	1,38

Table 2. Detail of the causes of rupture resultant from the replenishment

Picking	#	Weight (%)	%
Item in-store	79	8,74	0,36
¹¹ Validity inferior to 3 days	6	0,66	0,03
¹² Change of branding image	5	0,55	0,02
¹³ Change of in-store location	3	0,33	0,01
Total	93	15,45	0,42

Table 4. Detail of the causes of rupture resultant from the picking process.

Site	#	Weight (%)	%
Code asynchrony	36	6,0	0,16
Item substituted	9	1,5	0,04
Total	45	7,5	0,20

Table 3. Detail of the causes of rupture resultant from the site.

Retek	#	Weight (%)	%
Code asynchrony	138	15,3	0,58
Discontinued	24	4,1	0,09
Suspended	14	1,5	0,06
Total	176	20,9	0,73

Table 5. Detail of the causes of rupture resultant from Retek.

The data in Table 2., Table 3., Table 4., and Table 5. represent the data resultant from the measuring process represented in Figure 11. Figure 13, represents the different interventions of the causes of rupture.

Table 6. describes each cause of rupture.

Causes	Description
¹ Code asynchrony	Product code in force is the standard but in the information system is prevailing the promotional code and vice-versa.
² Replenishment failure	Supplier failed service level agreement.
³ Item in-store	The item was available in-store.
⁴ Restitution asynchrony	The item restitution occurred after COL in-store picking.
⁵ Stock-out	Item with no stock.
⁶ Insufficient in-store items	Item stock amount not enough to meet the picking order amount.
⁷ Discontinued	Item discontinued from the product catalog.
⁸ Suspended	Item suspended for not fulfilling quality parameters.
⁹ Wrong stock amount	Incorrect stock value in the Information System (Retek).
¹⁰ In transit	Merchandise in transit to the store.
¹¹ Unknown location - warehouse	The item warehouse location was not known.
¹² In-store shelf space	The in-store shelf space was not created.
¹³ Validity inferior to 3 days	Quality parameter in perishable products: validity has to be superior to 3 days.
¹⁴ Change of branding image	The change of label image or product form resulted in the miss identification of the products by the picker.
¹⁵ Change of in-store location	Picker would not find the item because of changes in the product's in store location.

Table 6. Description of each cause of inventory rupture.

This study also analyzed ruptures considering the products categories in order to understand if the product categories have influence in the causes of rupture. The collected data is represented in Table 7.

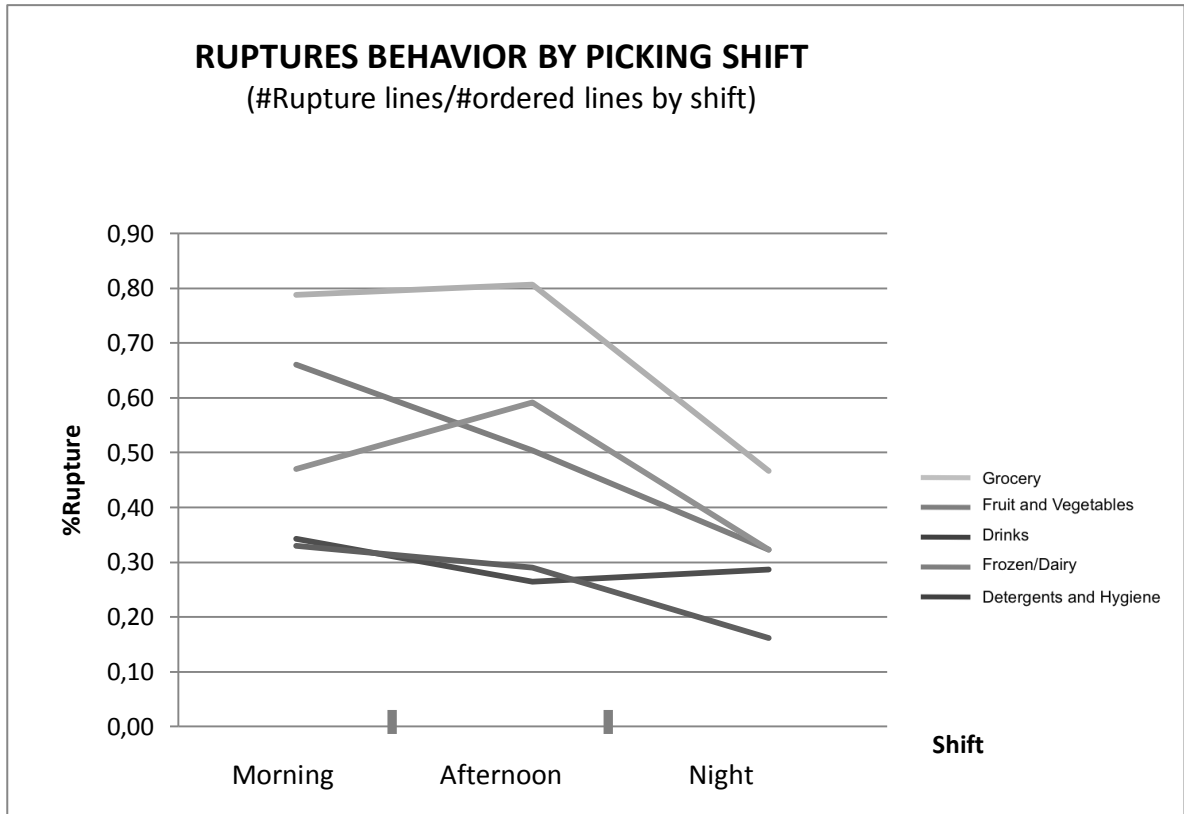
Category	#Ruptures	Ruptures Weight (%)	%Rupture
Butchery	49	5,4	9,1
TakeAway	7	0,8	7,0
Fruit & Vegetables	107	11,8	6,8
Culture	5	0,6	6,8
Bakery	19	2,1	5,7
Bricolage e Auto	2	0,2	4,5
Fishery	9	1,0	4,0
Drinks	63	7,0	3,0
Frozen/Dairy	113	12,5	2,9
Grocery	149	16,5	2,3
Delicatessen	17	1,9	2,0
Pets & Plants	4	0,4	1,5
Detergents and Hygiene	58	6,4	1,3
Not analyzed	302	33,41	1,37
Total	904	100,00	-

Table 7. Representation by descendent order of percentage of ruptures of the product categories in rupture during the period of measuring.

This data (Table 7.) shows that the perishable type of categories: Butchery, TakeAway, Fruits and Vegetables, and Bakery have higher percentages of rupture. This is due to successive changes of suppliers that change directly the EAN codes of the products and its substitutions at Retek are not always very effective, generating a rupture for COL. Another factor that explains these higher percentages of rupture is the restitution timing of the physical store operation. All these categories have zero stock in-store at the end of the day and every day the in-store stock has to be refilled.

The analysis from Graphic 1 also supports partially these facts.

Graphic 1. represents the behaviour of ruptures along the day (Graphic 1.), a very important analysis to support decisions related with the picking operation.



Graphic 1. Representation of the ruptures behaviour by picking shift of the most important product categories for COL.

This analysis allows to observe that most of categories have a higher %ruptures in the morning shift, decreasing almost abruptly in the night shift, except the Drinks category and that is maybe explained because of its top rotation nature. This behaviour is explained by the shop restitution of the products along the day.

The picking of ruptures of the morning shift takes place from 07:30AM until 09:30AM, and this period is coincident with the shop preparation for opening. The afternoon picking of ruptures takes place from 09:30AM until 11:30AM and during this period, through the in-store observation, the restitution, specially from the category Fruit and Vegetables, was stronger. The 2nd picking round correspondant to the night shift takes place from 11:30 to 01:30PM. In this period of time, the store restitution of the different product categories is stronger (once the in-store replenishment operations already took place), and hence the shop shelves are better replenished.

Customers perception acquaintance

The customers sample consisted of:

- 15 customers;
- 87% customers from Porto and 13% customers from Lisbon;
- Ages ranging from 24 years to 56 years;
- 47% of the interviewed customers had a Bachelor degree, 13% a Master degree and 27% a Doctoral degree.

The results of the semi-structured interview (Figure 13.) revealed that:

- 100% of the COL customers are satisfied with the service (level 4);
- When asked if they have been receiving their orders complete:
 - 40% of the customers answered yes;
 - 60% of the customers answered no;
- When asked what COL should do when there are missing items in an order delivery:
 - 100% of the customers replied that COL should call, specially when the items were perishable food, once they were relying and depending on them to their daily home tasks;
- When asked how could COL overcome the problem of delivering incomplete orders:
 - 40% of the interviewed customers suggested that COL should contact via call center with a list of recommended products to substitute the ones in rupture;
 - 60% of the interviewed customers suggested that in the case of perishable food products, it should be possible to select product substitutes, in order to be in control of the substitution of the critical products, similar to the shopping process in the physical store.

Summarizing and prioritizing the analyzed data in terms of relevance, it is possible to highlight the following points:

- 35% of the causes of rupture are due to an inefficient information management;

- 15% of the ruptures are due to poor design of the picking process.

The remaining 50% of the causes are out of COL's operations and management, once they are related with the operations of the physical store.

It is also important to highlight that the collected data from the semi-structured interviews revealed that they would like to be in control of the shopping process through the control perception of what is delivered, a control analog to the offline shopping process, specially regarding the perishable items.

5. Design Solutions (Implement)

The designed solutions aim to solve the information management and the picking process inefficiencies, and also to empower the customer's perception of control of the substitutions of perishable products.

To accomplish these aims this study proposes three solutions:

- A management information system specific for the ruptures – Ruptures Dashboard;
- A re-designed process for picking – Intelligent Picking;
- A motor of recommendations for the perishable products, allowing customers to choose their alternatives and to be in control of the shopping process.

4 Proposed Solutions and Prototypes

4.1 Ruptures Dashboard

The Ruptures Dashboard is a proposed solution that aims to integrate data and deliver information related with ruptures. Through this study analysis it was possible to observe that COL had lots of data and many daily reports under a very static format. Reports are files that are downloaded every day. This format for delivering information for managers has the following critical points:

- Does not contain relevant information;
- This format for delivering information does not allow the understanding of the rupture dynamics and evolution, because of its static nature, and does not allow to manage proactively.

To improve the delivery of information and also to integrate relevant information for managers regarding ruptures, this proposed solution is dynamic and integrative.

Based on the methodology for designing interactive interfaces, first this research identified the user needs and the requirements for this management information system.

User needs and system requirements

To recognize the context and to verify the way the activities are processed, this study performed an Open End Elicitation. Open interviews, high-level prototyping and role storming was performed. After this initial phase elicitation through prototyping was the adopted approach once it allows a better understanding of the Information System concept, and allows to validate more effectively the user requirements, once they may communicate better their needs.

After the elicitation, an analysis to all the needs expressed by the users was performed to structure the requirements and define priorities.

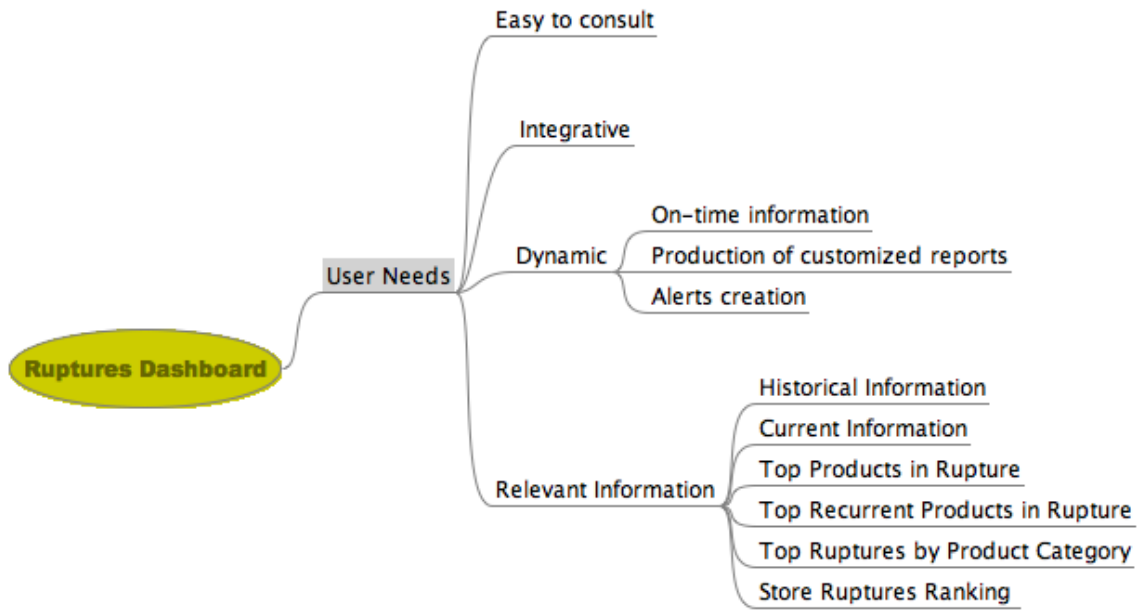


Figure 15. Mind Map resultant from the elicitation of the user needs.

System conceptualization

To conceptualize this information system, the actual specification of requirements was of great importance. The identification of the system's use cases (Figure 16.) and its requirements definition through a tree map diagram helped to define and communicate them to the stakeholders.

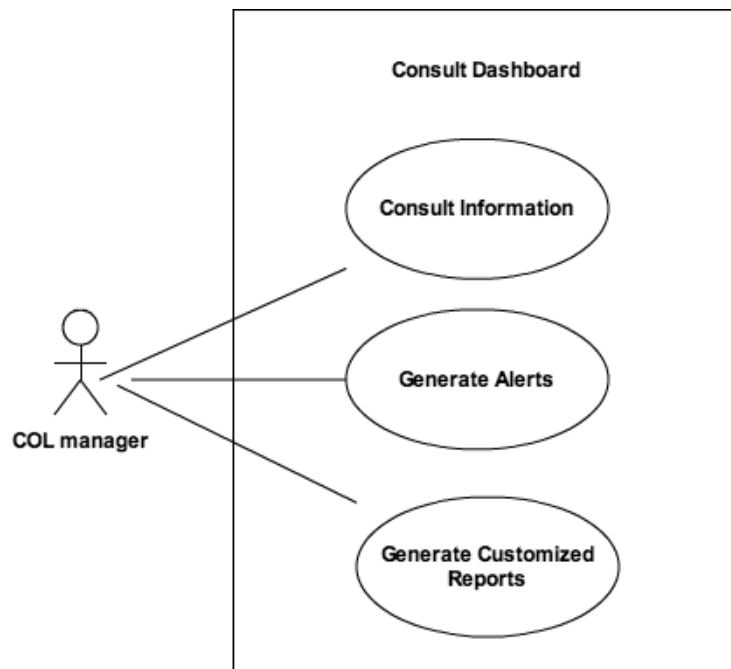


Figure 16. Generic Diagram of Use Cases

1. Consult Information

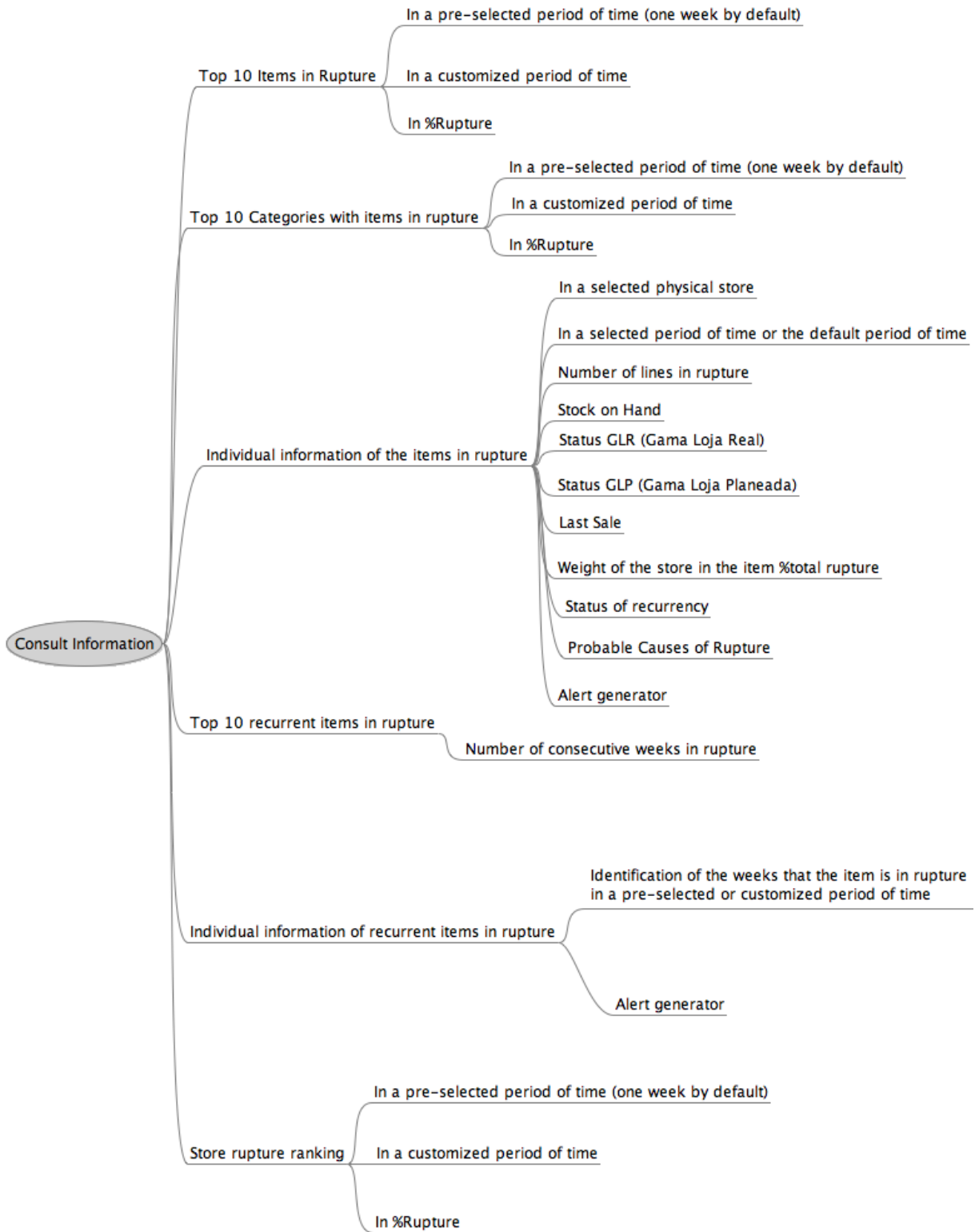


Figure 17. Mind Map of the requirements specification for the Use Case: Consult Information.

2. Generate Alerts

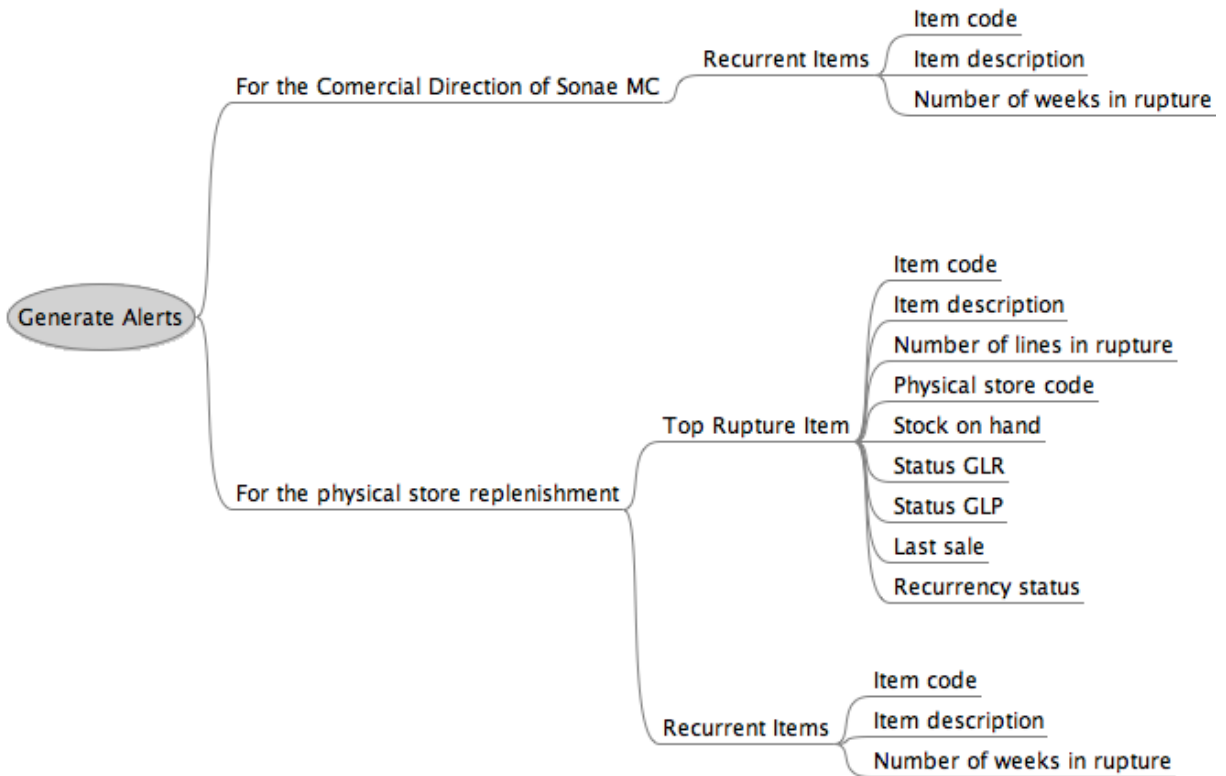


Figure 18. Mind Map of the requirements specification for the Use Case: Generate Alerts.

3. Generate Customized Reports

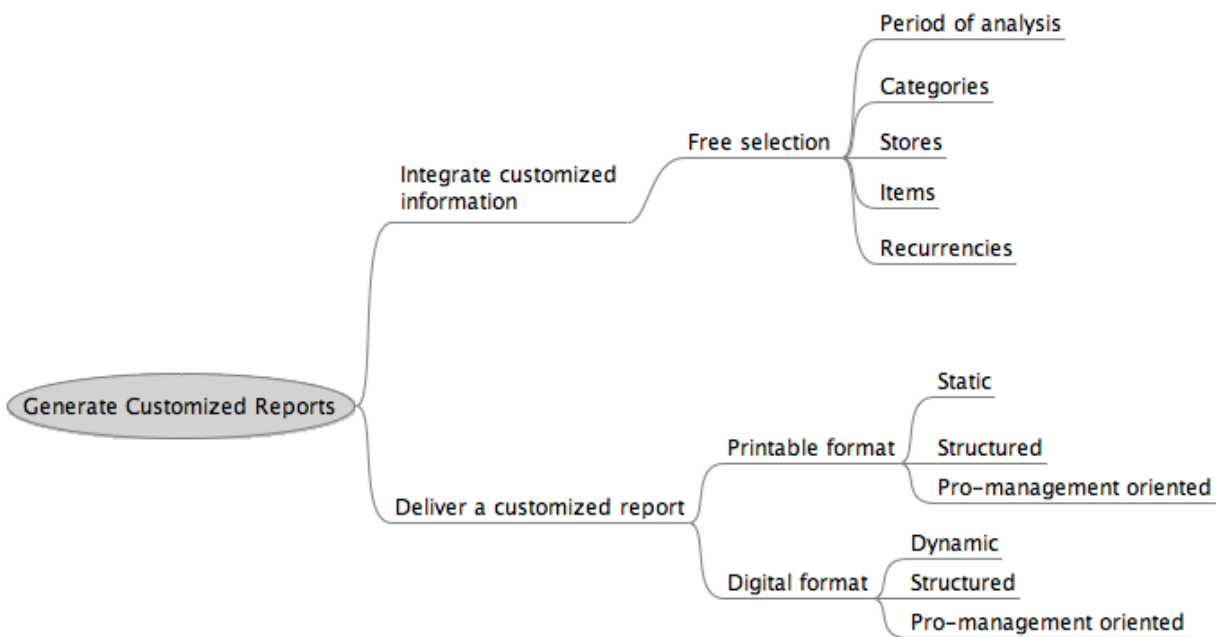


Figure 19. Mind Map of the requirements specification for the Use Case: Generate Customized Reports.

Prototyping and evaluation

Prototypes were used during the whole process until the interactive prototype was developed to be evaluated by the stakeholders and finally validated.

Besides the user needs mentioned above, design considerations were taken in account for the development of the prototype. Those design principles were chosen considering the context of use and they are represented below, Figure 20.

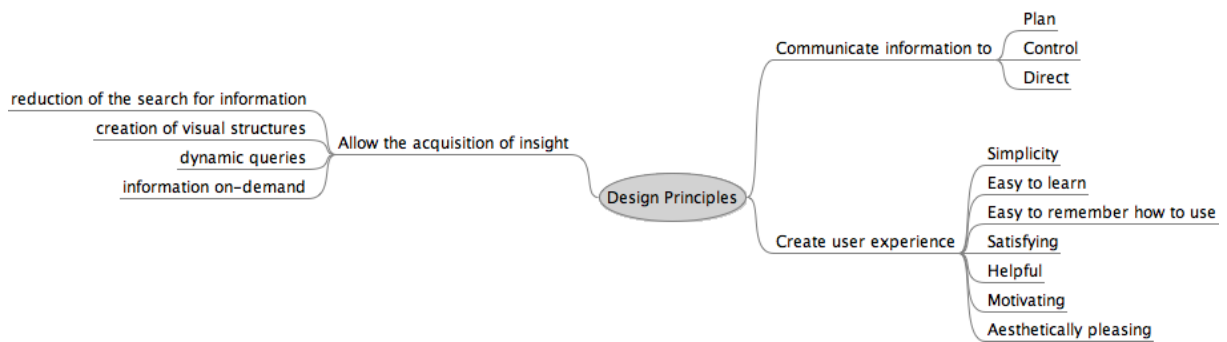


Figure 20. Mind Map representing the design principles taken in account for the development of the interface prototype of the Ruptures Dashboard.

Figure 21. represents the Home Page displays by default the information that COL managers indicated as important to display in first plan. There are no details in this information. The goal is to provide COL managers the visual identification of a pattern and trigger the need of zoom in to more details. On the left side there is the navigation menu that provides the means to explore in more depth the information that COL feel important to explore in order to plan, control and direct. The bar menu on the left has only the necessary menus that allow to navigate through the ruptures dashboard. The menus name identify easily the information that is displayed if selected by the COL managers or identify the actions that may be taken if selected (namely reports and alerts).

Inventory Ruptures of Continente Online – Sonae MC
Finding the Causes and the Solutions

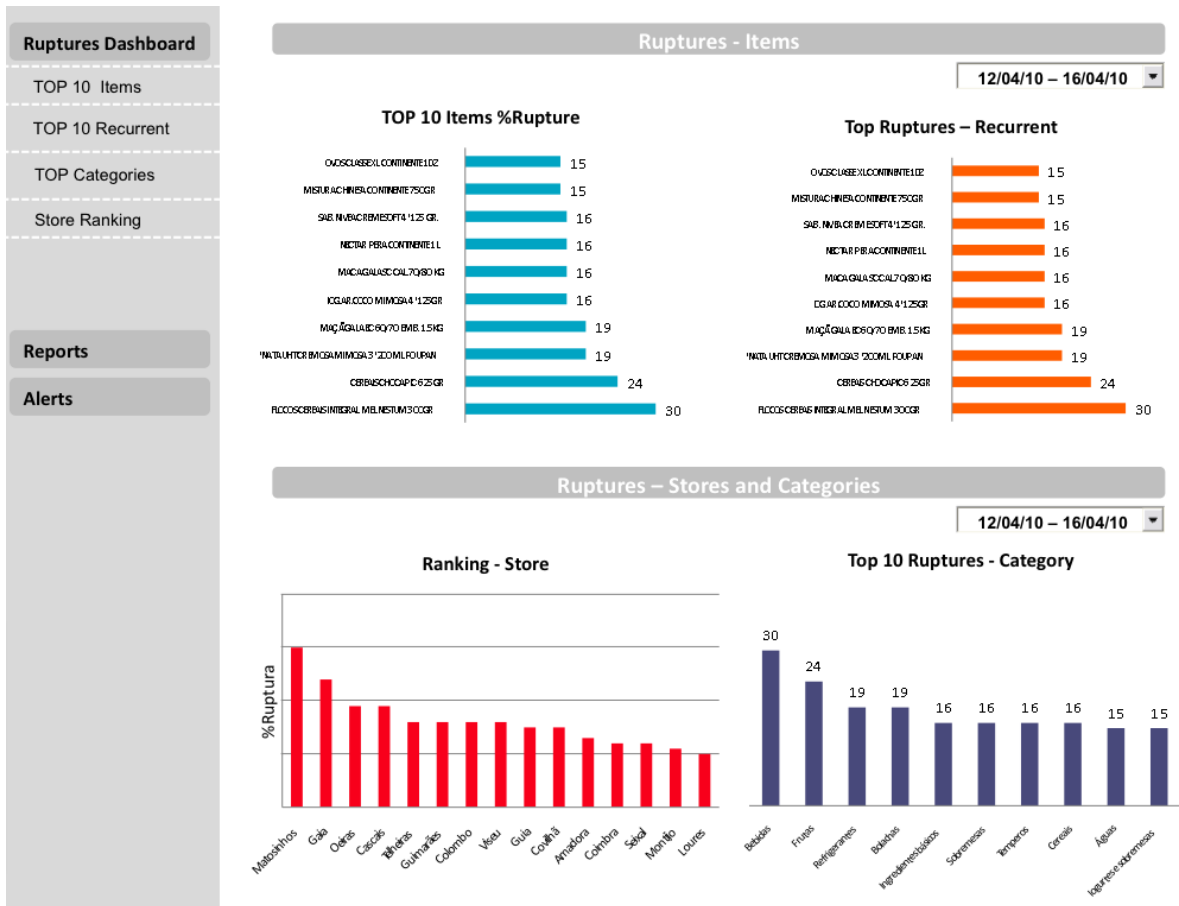


Figure 21. Home Page of the Ruptures Dashboard Information System.

Figure 22. represents the display of the interface when clicking in the Top 10 Items and Top 10 Recurrent (left and right respectively):

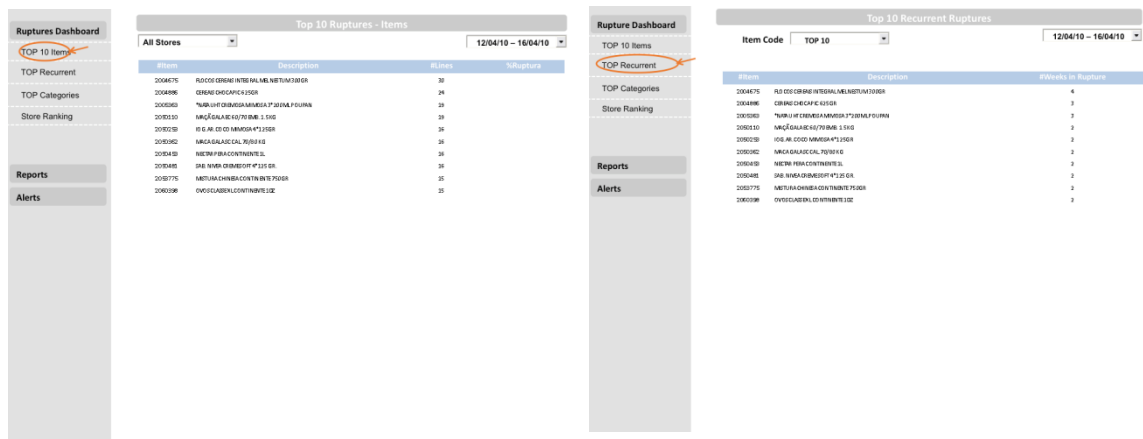


Figure 22. Display of the Top 10 Items menu on the right and of the Top Ruptures on the right.

Figure 23 displays the Top Categories and Store ranking menu (left and right respectively).

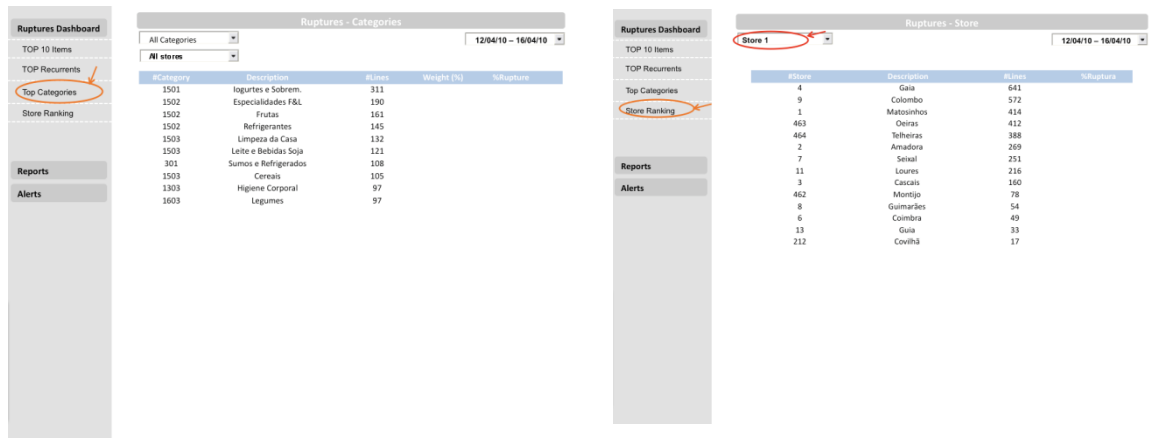


Figure 23. Display of the Top Categories menu on the right and of the Store Ranking on the left.

Figure 24 represents the display of the Reports and Alerts menus (left and right respectively).

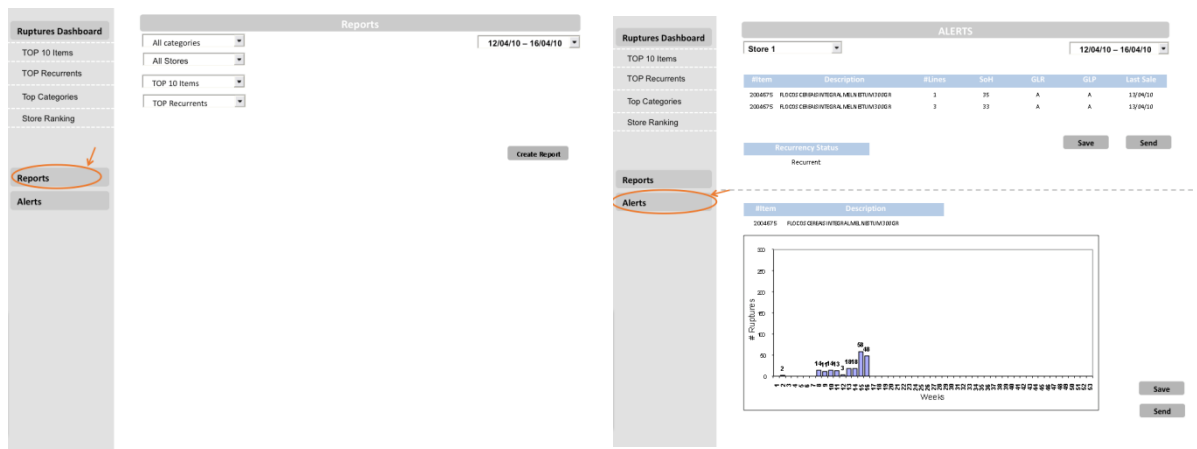


Figure 24. Display of the Reports page on the left and Alerts page on the right.

The interactive experience with the interface is detailed in Appendix B.

4.2 Intelligent Picking

The current picking process represented in Figure 7. requires the pickers to walk the whole shop-floor to pick the ordered items. This has two effects:

- Pickers do not really know well the store and have just a general knowledge of it;

- Pickers get dispersed, more tired, resulting in less patience to look for the items.

Based on these factors, picking should be re-designed in order to decrease the walking area of the pickers. Ideally, pickers should be responsible to pick in a fixed area, though they should rotate from times to times in order to cut the routine.

Another important factor would be the introduction of the Stock on Hand (SoH) information to support the picking process in store. This would help pickers to be sure if an item is or is not in-store or in-store warehouse and hence empower their performance.

As one of the problems is the store items restitution it would be interesting to have some pickers from the COL picking operation team to pick in the store warehouse or to adjust the picking operation hours to the shop restitution operation, though this would create variability in COL operation, as it operates in 15 different stores spread along Portugal.

In Figure 25. is represented a proposal of picking division by areas. Each area would be under the responsibility of 2-3 pickers and 2 pickers other pickers would collect the items. and another two would be responsible to verify if the orders were ordered by customer correctly.

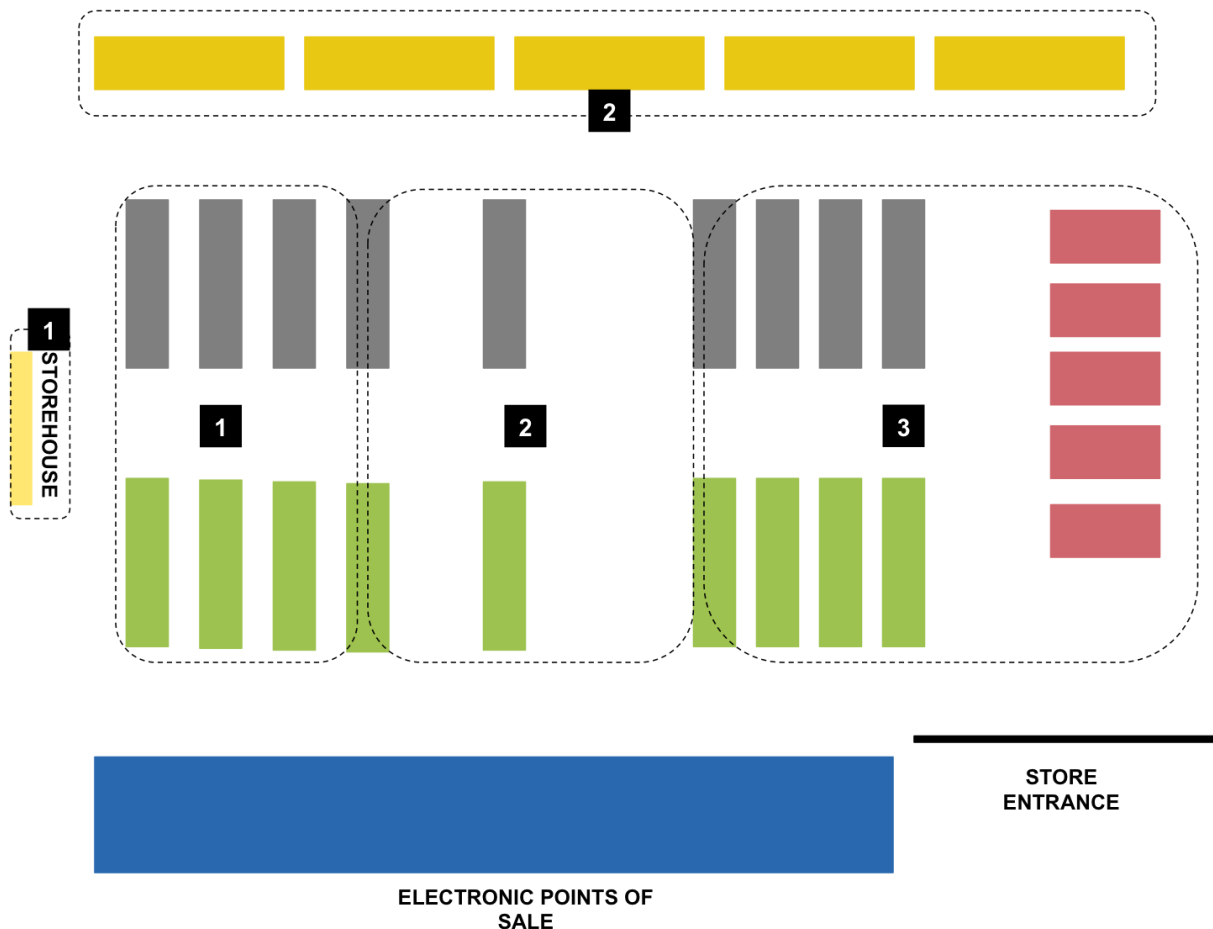


Figure 25. Representation of a store layout divided by picking areas.

activity of the 2 pickers that collect the picked items in-store and 2 more pickers that have to make sure that the orders assembling is done properly.

The inclusion of picking in the storehouse is to avoid the ruptures resultant from the restitution timings of the physical store operation. This can only be possible if in the support picking information the values of stock on hand (SoH) of the items are displayed allowing the pickers to understand if the item is not in store, and if there is SoH, probably the restitution operation did not refill the store shelves.

This re-designed process aims to provide the right information to the pickers and empower their performance, reduce their long picking rounds, making them more specialized and aware of their work setting. This transforms the process and its actors into a more empowered and intelligent activity - Intelligent Picking.

4.3 Motor of recommendations

In order to provide the perception of control to customers in the online shopping process, specially with products that on their perspective are critical – perishable food products, there should be the possibility to choose and select substitutes for the perishable items on the online shopping as represented in Figure 27. This would allow to approximate the online shopping process to the offline shopping once it would provide the ability to substitute items in the shopping car in case first choice is not available. Would also allow the delivery of more complete orders, specially in terms of customers expectations and satisfaction.

In Appendix B is represented the Service Experience Blueprinting that displays the service process responsible for the motor of recommendations that customers would like to experience while shopping online.

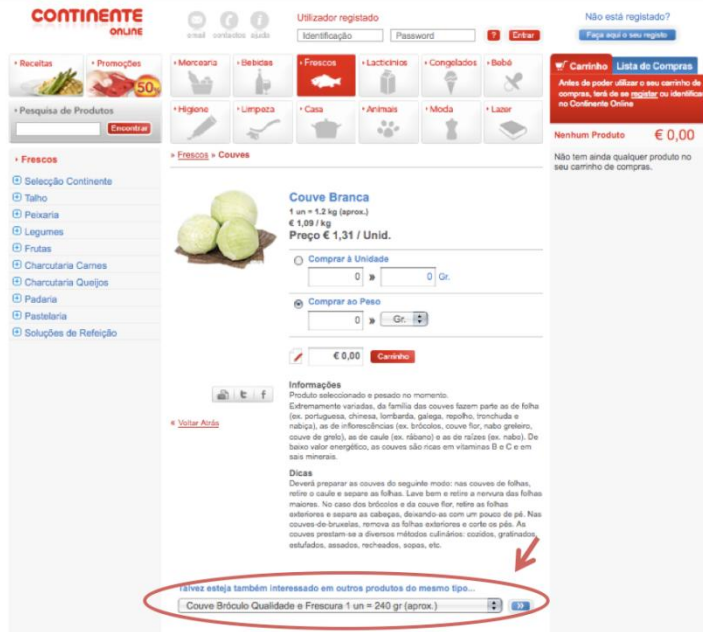


Figure 27. Display of Continente Online motor of recommendations for perishable products.

5 Conclusion and future work

The rise of Self-Service Technological Services based on a traditional and physical service model increases the service complexity.

This service complexity is particularly demanding in the management of the multiple service channels cohesion, and in this particular study is interesting to notice that Continente Online service is trying to have a coherent performance and offer the same value offer of the physical hypermarket with added value - convenience.

However, once the shopping process is not totally controlled by the customers, the delivery of an incomplete or a different order from the original ordering, creates a bad impact in the moment of service delivery.

Bearing in mind that a hybrid service system, e-service based on a physical service model, and that customer's feeling of lack of control in the shopping process may inhibit the online shopping, it is possible to assume that there is a very complex service system to manage.

This service paradigm highlights the need of service oriented methodologies that provide a good insight of the service system as a whole and also highlights the need of methodologies and tools that are customer centered and that allow to design a customer centric service.

This study's scope, though, is more restrict once it is related with a particular service problem of the service system - COL inventory ruptures. But even though, through the use of a customer oriented approach for services it was possible to collect customers insights for this problem and through the use of a service oriented methodology and tools, it was possible to collect customer oriented processual insights of the organization's activities related directly or indirectly to the inventory ruptures.

This study attempts to find the causes and the solutions of the inventory ruptures through a customer and service centric approach. One may conclude that through service and customer centric methodology it is possible to identify, analyze and re-design solutions for the organization, and that the adopted mixed methodology - Six Sigma for Services complemented by the tools Service System Navigation and Service Experience Blueprinting - allowed to verify that 35% of the causes of inventory ruptures of COL are due to lack of a management information system adequate for the managing activities and that 15% of the

causes of inventory rupture are due to picking failures. The remaining 50% are not under the management umbrella of COL. These findings allowed the design of a Management Information System for ruptures - Ruptures Dashboard - that together with the re-design of the picking process- intelligent picking - may potentially decrease the inventory ruptures through the normal activities of the organization.

Having collected data related with customer perception of the inventory ruptures in the moment of the service delivery, it was possible to verify that it is important for the customer to be in-control of the potential item substitutions and that the perishable, fresh food products are the most critical for customers once they depend on them frequently to prepare their planned meals in a short term notice. To overcome this, it is proposed to allow customers to select product substitutes in this type of items allowing to deliver more frequently what the customers expect.

With these three proposed solutions it is expected to improve globally the service in terms of inventory ruptures and in the near future implement pilot studies to measure their real impact in the organization's processes efficiency and effectiveness and continue to improve COL's processes and customer awareness in this matter.

It would be of great value to study in a high-level basis the service system of the Continente brand and have a systematic view of the whole service system. This would allow to have a better insight of the service points that may be critical and through its analysis, act for the global improvement of the service, instead of acting only in an isolated and self-contained scope.

The implementation of pilot projects for each of the proposed solutions and the measuring of its impact in terms of customer satisfaction and loyalty, and in terms of cost-effectiveness for the organization in a perspective of continuous process improvement, along with a wider view of the service system are the future directions of this study.

These future work directions aim essentially to shift progressively COL in to a more service and customer oriented business, to support sustainably its objective of growth as an e-retailer and become the biggest retail shop of Portugal.

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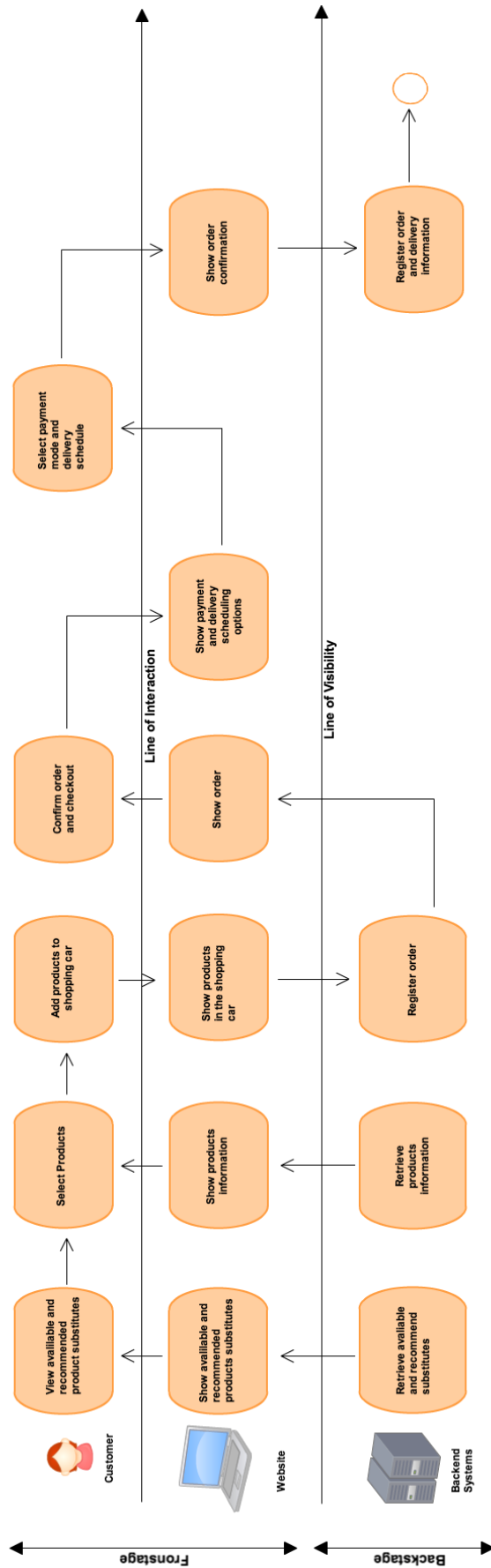
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Appendix A - Service Experience Blueprinting for the design of the motor of recommendations



Appendix B - Example of interaction and navigation on the Ruptures Dashboard Information System

Ruptures Dashboard

TOP 10 Items

TOP 10 Recurrent

TOP Categories

Store Ranking

Reports

Alerts

Ruptures - Items

12/04/10 – 16/04/10

TOP 10 Items %Ruptura

Item	%Ruptura
Ovos Classe XL Continente 10z	15
Mistura Chinesa Continente 750gr	15
Sabonete Nivea Soft 4*125gr	16
Nectar Pêra Continente 1L	16
Maca Gala Escal 70/80kg	16
Iogurte Coco Mimosa 4*125gr	16
Maçã Gala Esc 60/70 BMB 1.5kg	19
Nata UHT Cremosa Mimosa 3*200ml Poupain	19
Cereais Cho Capic 625gr	24
Flocos Cereais Integral Mlb Nestum 300gr	30

Top Ruptures – Recurrent

Item	%Ruptura
Ovos Classe XL Continente 10z	15
Mistura Chinesa Continente 750gr	15
Sabonete Nivea Soft 4*125gr	16
Nectar Pêra Continente 1L	16
Maca Gala Escal 70/80kg	16
Iogurte Coco Mimosa 4*125gr	16
Maçã Gala Esc 60/70 BMB 1.5kg	19
Nata UHT Cremosa Mimosa 3*200ml Poupain	19
Cereais Cho Capic 625gr	24
Flocos Cereais Integral Mlb Nestum 300gr	30

Ruptures – Stores and Categories

12/04/10 – 16/04/10

Ranking - Store

Top 10 Ruptures - Category

Top 10 Ruptures - Items

12/04/10 – 16/04/10

All Stores

#Item	Description	#Lines	%Ruptura
2004675	FLOCOS CEREAIS INTEGRAL MLB NESTUM 300 GR	30	
2004896	CEREAIS CHO CAPIC 625GR	24	
2005363	*NATA UHT CREMOSA MIMOSA 3*200ML POU PAIN	19	
2050110	MAÇÃ GALA ESC 60/70 BMB 1.5KG	19	
2050258	IO G. AR. CO CO MIMOSA 4*125GR	16	
2050362	MACA GALA ESCAL 70/80 KG	16	
2050458	NECTAR PÊRA CONTINENTE 1L	16	
2050481	SAB. NIVEA CREMOSO FT 4*125 GR.	16	
2053775	MISTURA CHINESE CONTINENTE 750GR	15	
2060398	OVOS CLASSE XL CONTINENTE 10Z	15	

Ruptures Dashboard

TOP 10 Items

TOP Recurrent

TOP Categories

Store Ranking

Reports

Alerts

Ruptures Dashboard

TOP 10 Items

TOP Recurrent

TOP Categories

Store Ranking

Reports

Alerts

Top 10 Ruptures - Items

All stores
Store 1
Store 2

12/04/10 – 16/04/10

	Item	#Lines	%Rupture
2004675	FLOCOS CEREAIS INTEGRALMEL.NESTUM300GR	30	
2004886	CEREAIS CHOCAPI625GR	24	
2005363	*NABAUHT CREMOSA MIMOSA 3* 200ML POU PAN	19	
2050110	MAÇA GALA EC 60/70 BVB. 1.5KG	19	
2050258	IO G. AR. CO CO MIMOSA 4*125GR	16	
2050362	MAÇA GALASC CAL 70/80 KG	16	
2050458	NECTAR PIRA CONTINENTE1L	16	
2050481	SAB. NIVEA CREMOSO FT 4*125 GR.	16	
2058775	MISTURA CHINESA CONTINENTE 750 GR	15	
2060398	OVOS CLASSE XL CONTINENTE1DZ	15	

Rupture Dashboard

TOP 10 Items

TOP 10 Recurrent

TOP Categories

Store Ranking

Reports

Alerts

Top 10 Ruptures - Item

Store 1

12/04/10 – 16/04/10

Date	#Item	Description	#Lines	SoH	GLR	GLP	Last Sale
13/04/10	2004675	FLOCOS CEREAIS INTEGRALMEL.NESTUM 300 GR	1	35	A	A	13/04/10
16/04/10	2004675	FLOCOS CEREAIS INTEGRALMEL.NESTUM 300 GR	3	33	A	A	13/04/10

Store weight item rupture(%)

3

Recurrency Status

R

Probable causes

- Code asynchrony
- Wrong stock value
- Suspended

Create Alert

Rupture Dashboard

- TOP 10 Items
- TOP 10 Recurrent
- TOP Categories
- Store Ranking

Reports

- Alerts

ALERTS

Store 1 12/04/10 – 16/04/10

#Item	Description	#Lines	SoH	GLR	GLP	Last Sale
2004675	FLO COS CERBAIS INTEGRAL MELN ESTUM300GR	1	35	A	A	13/04/10
2004675	FLO COS CERBAIS INTEGRAL MELN ESTUM300GR	3	33	A	A	13/04/10

Recurrency Status Save Send

Recurrent

Rupture Dashboard

- TOP 10 Items
- TOP Recurrent
- TOP Categories
- Store Ranking

Reports

- Alerts

Top 10 Recurrent Ruptures

Item Code 12/04/10 – 16/04/10

TOP 10

#Item	Description	#Weeks in Rupture
2004675	FLO COS CERBAIS INTEGRAL MELN ESTUM300GR	4
2004886	CERBAIS CHO CAPIC 625 GR	3
2005363	*NAB U HT CREMOSA MIMOSA 3*200 MLP OUPAN	3
2050110	MAÇÃ GALA EC 60/70 BMB 1.5 KG	2
2050253	IO G AR CO CO MIMOSA 4*125GR	2
2050362	MAÇÃ GALA SC CAL 70/80 KG	2
2050453	NECTAR PERA CONTINENTE 1L	2
2050481	SAB NINEA CREME SOFT 4*125 GR	2
2053775	MISTURA CHINESA CONTINENTE 750GR	2
2060398	OYOS CLASS EXL CO NTINENTE 1DZ	2

Ruptures Dashboard

- TOP 10 Item
- TOP Recurrent**
- TOP Categories
- Store Ranking

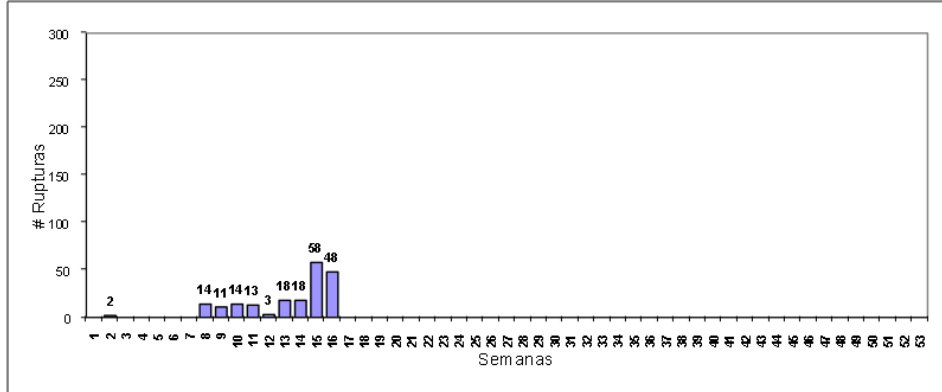
Reports

Alerts

Top 10 Recurrent Ruptures

Item Code **2004675**

2004675 - Flocos Cereais Integral Mel Nestum emb. 300 gr



Create Alert

Ruptures Dashboard

- TOP 10 Items
- TOP Recurrents
- Top Categories
- Store Ranking

Reports

Alerts

ALERTS

Store 1

12/04/10 – 16/04/10

#Item	Description	#Lines	SoH	GLR	GLP	Last Sale
2004675	FLOCOS CEREAIS INTEGRAL MEL NESTUM 300 GR	1	35	A	A	13/04/10
2004675	FLOCOS CEREAIS INTEGRAL MEL NESTUM 300 GR	3	33	A	A	13/04/10

Recurrency Status

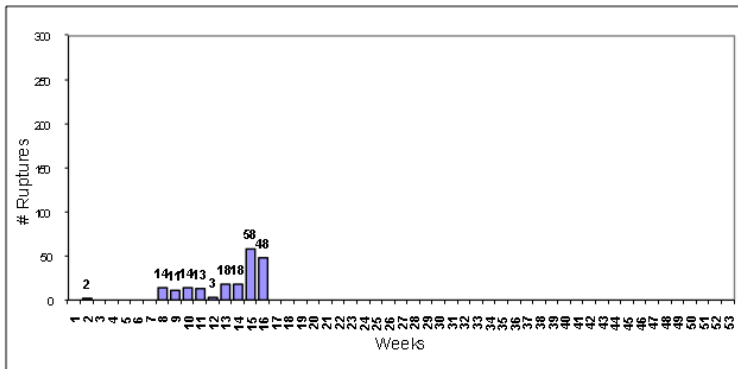
Recurrent

Save

Send

#Item Description

2004675 FLOCOS CEREAIS INTEGRAL MEL NESTUM 300 GR



Save

Send

Ruptures Dashboard

- TOP 10 Items
- TOP Recurrents
- Top Categories
- Store Ranking**

Reports

Alerts

Ruptures - Store

Store 1 12/04/10 – 16/04/10

#Store	Description	#Lines	%Ruptura
4	Gaia	641	
9	Colombo	572	
1	Matosinhos	414	
463	Oeiras	412	
464	Telheiras	388	
2	Amadora	269	
7	Seixal	251	
11	Loures	216	
3	Cascais	160	
462	Montijo	78	
8	Guimarães	54	
6	Coimbra	49	
13	Guia	33	
212	Covilhã	17	

Ruptures Dashboard

- TOP 10 Items
- TOP Recurrents
- Top Categories
- Store Ranking**

Reports

Alerts

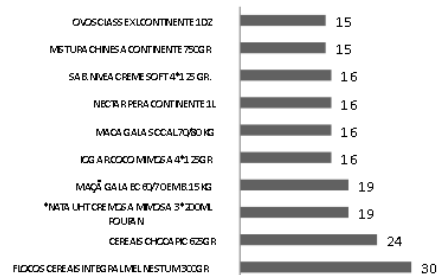
Ruptures - Store

Store 1 12/04/10 – 16/04/10

Top Ruptures Store 1

#Item	Description	#Lines	%Rupture
2004675	FLO COS CEREAIS INTEG RAL MEL NESTUM 300GR	30	
2004886	CEREAIS CHO CAPIC 6 25GR	24	
2005363	*NATR UHT CREMOSA MIMOSA 3* 200ML P OUPAN	19	
2050110	MAÇÃ GALA EC 60/70 BVB. 1.5KG	19	
2050259	IO G .AR. CO CO MIMOSA 4*125GR	16	
2050362	MAÇA GALASCAL 70/80 KG	16	
2050459	NECTAR PERA CONTINENTE 1L	16	
2050481	SAB. NIVEA CREMOSO FT 4*125 GR.	16	
2050775	MISTURA CHINEA CONTINENTE 750GR	15	
2060398	OVO SCLASSE LLL CONTINENTE 1L	15	

TOP 10 Artigos %Rupture



Ruptures Dashboard

- TOP 10 Items
- TOP Recurrents
- Top Categories**
- Store Ranking

Reports

Alerts

Ruptures - Categories

All Categories 12/04/10 – 16/04/10

All stores

#Category	Description	#Lines	Weight (%)	%Rupture
1501	Iogurtes e Sobrem.	311		
1502	Especialidades F&L	190		
1502	Frutas	161		
1502	Refrigerantes	145		
1503	Limpeza da Casa	132		
1503	Leite e Bebidas Soja	121		
301	Sumos e Refrigerados	108		
1503	Cereais	105		
1303	Higiene Corporal	97		
1603	Legumes	97		

Ruptures Dashboard

- TOP 10 Items
- TOP Recurrents
- Top Categories
- Store Ranking
- Reports**
- Alerts

Reports

All categories 12/04/10 – 16/04/10

All Stores

TOP 10 Items

TOP Recurrents

Create Report