Improvement of a Control Management Web Application by Considering Operational Costs and Stocks

José Miguel Pinto Nunes da Costa

Master's Dissertation

Supervisor: Prof. Isabel Horta

U. PORTO

FEUP FACULDADE DE ENGENHARIA
UNIVERSIDADE DO PORTO

Integrated Master in Industrial Engineering and Management

July 2018

Abstract

Companies require flexible and effective Management Control Systems (MCS) to develop and execute business strategies. By introducing new features in a Control Management Web Application, used as a MCS in the commercial activity of the youth segment in NOS – Comunicações, S.A., this dissertation project aims to answer several strategical concerns of the business. Two modules, Operational Costs and Stocks, were developed and integrated in the existing Control Management Web App.

Goals were set to account the entire cost structure of the business and introduce a new logistic supply chain process. When the project gets fully implemented, it is expected to have real-time data on operational expenditures and to have significant reductions in the operational load of the agencies. Furthermore, it is expected that with the introduction of these module the company will be able to make better decision on budget allocations and have more control and accurate account of inventory.

Using Agile principles and the concept of Minimum Viable Product the focus of this project was to solve the ever-changing needs of the company. The methodology followed carries out an analysis of the project in terms of MCS requirements and features and then uses the Scrum framework, from the Product Owner perspective, to develop concert solutions to the problem at hands. In the end, several features were implemented, from budgeting, to a costs dashboard with downloadable Excel reports, ending with a table displaying the inventory by point of sale. Nevertheless, the MCS is not fully implemented yet and a lot of work still needs to be done in terms of software development.

This project gave an important step to turn the Control Management Web App into a platform of reference within the company. The Agile approach followed was focused on effectiveness and manoeuvrability and the conclusion taken is that, after all, the improvements made are only temporary solutions because the real solution is adaptability to change. If it is Agile, it is always evolving.

key-words: Control Management Web App; Agile; Scrum; Management Control System; Costs and Stocks;

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Resumo

As empresas precisam de Sistemas de Controlo de Gestão (SCG) eficientes e flexíveis para desenvolver e executar estratégias de negócio. Ao introduzir novas funcionalidades numa Aplicação Web de Controlo de Gestão, usada como um SCG na atividade comercial do segmento jovem na NOS – Comunicações, S.A., este projeto de dissertação tenta responder a diversas preocupações estratégicas do negócio. Dois módulos, Custos e Stocks Operacionais, foram desenvolvidos e integrados na já existente Aplicação Web de Controlo de Gestão.

Objetivos foram definidos para contabilizar a estrutura de custos do negócio e introduzir um novo processo logístico na cadeia de abastecimento. Quando o projeto estiver implementado, é esperado ter dados em tempo real dos gastos operacionais e que existam reduções significativas na carga operacional das agências. Para além disso, é esperado que com a introdução destes módulos a empresa possa tomar melhores decisões sobre alocações de orçamentos e que tenha maior controlo e precisão na contabilização de inventário.

Usando princípios Agile e o conceito de Mínimo Produto Viável o foco deste projeto foi resolver as necessidades em constante mutação da empresa. A metodologia seguida faz uma análise do projeto em termos de requisitos e funcionalidades do SCG e depois usa a estrutura Scrum, da perspetiva do *Product Owner*, para desenvolver soluções concretas para o problema em mãos. No final, várias funcionalidades foram implementadas desde orçamentação, até um *dashboard* de custos com relatórios de Excel extraíveis, acabando numa tabela que exibe o inventário por ponto de venda. No entanto, o SCG ainda não está completamente implementado e muito trabalho ainda precisa de ser feito em termos de desenvolvimento de software.

Este projeto deu um passo importante para transformar a Aplicação Web de Controlo de Gestão numa plataforma de referência para a empresa. A abordagem Agile que foi seguida estava focada em eficiência e manobrabilidade e a conclusão chegada é que, depois de tudo, as melhorias efetuadas são apenas soluções temporárias porque a solução real é adaptação à mudança. Se é Agile, está em constante evolução.

palavras-chave: Aplicação Web de Controlo de Gestão; Agile; Scrum; Sistemas de Controlo de Gestão; Custos e Stocks;
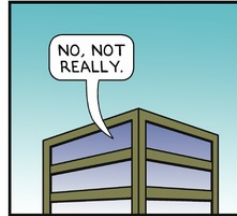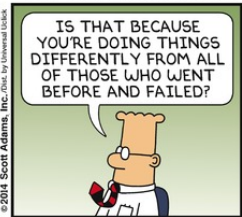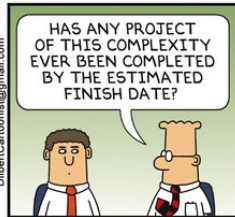
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Acronyms and Abbreviations

ABC	Activity-Based Costing
CLV	Customer Lifetime Value
FIFO	First-In, First-Out
GA	Gross Add
IT	Information Technology
KPI	Key Performance Indicator
LIFO	Last-In, First-Out
MCS	Management Control Systems
MVP	Minimum Viable Product
NPS	Net Promoter Score
POS	Point Of Sale
RGU	Revenue Generating Unit
Telco	Telecommunications
Web App	Web Application

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Chapter 1

Introduction

The digital world provides essential management tools to keep track of financial and operational performance metrics indispensable to run the business. Nowadays, efficiently retrieving and processing data provides a strategical advantage and, more importantly, the way actionable knowledge is extracted, establishes the difference between value creation or value waste. Since the 90s, Information Technology (IT) has been used in enterprise contexts, with significant impact on the business of different industries and services, including the telco sector, which according to the Global Information Technology Report, published in 2016 by the World Economic Forum, "telecommunications service providers have an opportunity to capture 1.8 trillion US dollars in new economic value" arising from the effective adoption of new technologies. The importance of being able to "disrupt or be disrupted"[1] is forcing companies to adapt to the digital economy, unveiling new opportunities that must be capitalized to achieve profitability and growth.

In this chapter it will be explained the scope of the project, why it was developed and the context in the company that led to the implementation of new requirements in the existing Control Management Web Application (Web App), namely operational costs and stocks associated with the commercial activity of the youth segment. A background of the company and a succinct description of the business segment where the project took place is also given to provide a better understanding of the strategic vision that this project aims to pursue. The methodology is carefully described and explained to present the practices adopted and followed. Finally, at the end of the chapter, a synopsis of the dissertation structure compiles all the main chapters that will appear throughout this document.

1.1 Context

The project was conducted in NOS – Comunicações, S.A. (NOS), a communications company, one of the several companies administered by the holding NOS Group, as seen in Appendix A, Figure A.1. NOS offers to all market segments[2] fixed and mobile solutions for television, Internet,

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[1]Statement from John Chambers, executive chairman and former CEO of Cisco.
[2]Residential, Personal, Business and Wholesale.

voice and data (NOS, 2018c). Operating in the Portuguese market since 2014, the NOS group stems from a sizeable merge between two large communications companies: ZON Multimédia and OPTIMUS Telecomunicações. The company that emerged from this merge took advantage of synergies and improved the commercial offer, which allowed a stable growth of the consolidated net income since its creation (ZON OPTIMUS, 2013; NOS, 2014, 2015, 2016, 2018a). With a huge brand awareness in the market, the company was considered in 2018, for the fourth year in a row, the leading operator in telecommunications and entertainment in Portugal (NOS, 2018b).

In a enterprise context, this dissertation proposes to develop a solution to control operational costs and stocks tied to the commercial activity of the WTF mobile tariff, the stand-alone product targeted at the youth segment. With the constant growth of this business segment, the complexity of handling the different business variables related to the operational activity increased the necessity to restrict the overall expenditures of the operation. By exploiting new features in a Control Management Web Application, developed internally in 2016 and used by the sales force and the management team ever since, the company saw an opportunity to align certain strategic goals using this digital tool. The scope of this project is then to improve this web application, introducing new features and functionalities, in terms of costs and stock control, enabling new insights and further control over the commercial performance of the business.

1.2   WTF "Tá-se tudo a passar"

NOS is known to be a innovative company when it comes to marketing and the WTF brand, as seen in Figure 1.1, is a good example of it. The idea to establish a new brand that could have a magnetic communication with the youth segment, ranging from 6 to 25 years old, was developed by OPTIMUS, in a time when the company has struggling to penetrate in the youth segment. The juvenile consumers from generation Z, the post-millennial, accustomed to technology and social media, grew with the advent of Internet and required a mobile tariff that reflected their values, tastes and the cultural trends of their age. To be aligned with the target, distancing this product from the traditional and old-fashioned wholesale consumers mobile tariffs, the company redesigned their offer and introduced a new mobile tariff with unlimited data usage for certain mobile applications. In a time when smartphones were beginning to emerge, this decision disrupted the market and opened a precedent that was soon copied by competitors.

Figure 1.1: WTF Brand

But to reach these post-millennial marketing was not enough. The management team had to sub-contract a sales force to go in "guerrilha" where this youngsters were most prone to hang-out[3]. With a competitive marketing offer, based on the handover of SIM cards with free top-ups for large periods of time, the product gained market share and currently the youth segment has a comfortable customer base. The operation shifted from a sporadic and seasonal commercial activity to a continuous sales force spread across several retail facilities. To this day, the business continuous to grow with a tremendous focus on quality and operational excellence. Its success relied, until now, in an incessant acquisition of new customers fostering a continuous growth of the customer base, the result of a perfect match between effective marketing and productive sales.

As seen in Appendix A, Figure A.2, the product is divided into low, medium and high price plans. With different features in terms of minutes and data usage, the three plans have in common the unlimited usage of text and messaging "apps". Through the commercial channel, SIM cards are sold for an initial top-up that offers three free top-ups in the high price plan. On top of all that, to convince the client, a premium gift is handed out when the product is acquired, not only to create an impulse to buy but also to function as an additional argument to close the sale. Other low-cost gifts are also distributed to activate the brand, without any commercial purpose.

In term of marketing, the commercial offer can be considered a shopping product, usually compared among other similar consumer products and less frequently purchased by the client (Armstrong and Kotler, 2014). In this sense it is important that the sales force reinforces the core benefits of the product and enhances the irreverent and challenging appeal of the brand to convince the client that he's buying something different, unique and somehow exclusive. This sales pitch has five stages: the initial approach, the diagnosis of the client, the presentation of the product, the overcome of objections and the closing sale. If this process is correctly performed, the likelihood of acquiring a new customer is higher. This being said, the role of the supervisor and the management team is to assure that in each and every contact with the client there is quality in the sale process, something that can be very difficult, or somehow impossible, to be fully achieved.

The sales process is the most direct link to the client and effectively managing the quality of each and every sale turns to be the key factor to create value. The company strategy for the youth segment is to be a market leader and provide the best customer experience. Therefore, the design, management and control mechanisms of the sales process plays an important role, "under the hood", to this effect.

1.3 Improvement of the Control Management Web Application

With the increasing complexity of the commercial activity, management struggled to keep track on how the operation was doing and there was a need to develop a software tool that could easily monitor and register key information regarding the sales process. Initially, the internal IT department at NOS was consulted to assess the possibility of developing such tool, but soon this hypothesis was discarded, when the company realized that creating this software internally would be a

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[3]Schools, universities, music events, beaches.

painful, slow and ineffective process. The alternative chosen was to select an external company to develop the software from scratch, allowing an agile approach to organize, plan and implement the specific requirements of the project in a short period of time, with high flexibility and adaptability to change (Miller 2001; Highsmith and Cockburn 2001; Abrahamsson et al. 2002; Mahnic and Drnovscek 2005). Ideavity, an old partner of OPTIMUS with a deep knowledge of the company structure and work methodologies, was the software development partner chosen to help bring this project to life.

The Control Management Web App was built having a front and back office associated, the App Dealer and the Back Office, respectively. The App Dealer is used by the salespeople to check-in into the Point Of Sale (POS) and register every sale made during the day; additionally it allows salespeople to view monthly rankings of performance and the sales objective defined for that POS. With all the data gathered through the App Dealer, the information is then compiled and analysed in real time, resorting to the Back Office. The Control Management Web App has different levels of permissions and can be accessed through any device with Internet access to a web-browser, allowing the salesperson to use a digital device to register the sale instead of recording that information in a piece of paper. The efficiency gains for the company of automating this process were huge. With the Control Management Web App was now possible to monitor and evaluate sales performance in a daily basis, responding more quickly to bad results and having a stricter control over the commercial activity as a whole. Improvements in data processing were later achieved by crossing internal data with the information collected in the App Dealer and new functionalities were introduced to plan and monitor the activity of the sales force supervisors. When this project began, the company was considering to introduce a second module to help control costs and stocks. This was a logical development to improve the Management Control System (MCS) implemented that still lacked certain performance indicators such as inventory levels or the cost of acquiring a customer by POS.

A new logistic supply chain project that required a redefinition of the MCS implemented at the time was being developed. By introducing the new logistic process, the company was expecting to reduce the operational load of the agencies and increase the focus in the sales process. On top of that, management knew that, as Johnston and Marshall (2016) points, "managing costs carefully is often the difference between a thriving business and the one that struggles to exist". They felt that the continuous growth of the youth segment required a more strict and rigorous control over the overall commercial activity. The development of the existing management tools, namely the Control Management Web App, would become critical elements either to express value to top management or to evaluate the maximum potential of the product. The continuous growth of the business in terms of sales volume, lead to more costs and inventory associated with the operation and therefore increased the difficulty of accounting all spending in an expedient and time effective way. The geographic dispersion of the different POS also created new challenges because the commercial team was faced with the difficult decision of selecting which places represented key locations in terms of profitability and sometimes the choice of whether or not continue with the operation in that location was based on insufficient information regarding the cost of customer

acquisition or the actual expenditures in categories like supervision or gifts. Moreover, the introduction of a third agency in February increased the operational load of the Sales Manager and the company wanted to ease his burden, opening the door for this dissertation project.

In sum, the scope of this dissertation is to improve the Control Management Web App and introduce new control management metrics to create and implement a new MCS that allows better decision making, based in real-time metrics directly retrieved from the commercial operation. The project has the following goals:

- Account operational costs through the Control Management Web App to be able to understand, in real-time, the expenditures of each POS and have a better decision-making process on budget allocation.

- Development of the Control Management Web App to support the chain supply of the different POS to reduce the operational load of the sub-contracted agencies and have a more accurate account on inventory expenditure.

In the end it is expected that the implementations presented in the Control Management Web App are just part of an iterative process of improvements aligned with the strategy of the company to establish this tool as a platform which centralizes information, being an internal reference in the commercial management of the youth segment.

1.4 Methodology

The methodology chosen to help guide and conduct this project was based in the Scrum framework, represented in Appendix B, Figure B.1, to tackle the problem at hands and complete the project in the minimum amount of time. This methodology sustained by the Agile philosophy is an iterative, incremental and simple way to develop a solution to solve the ever changing needs of the company. In this project, the Scrum Team was composed by the Product Owner, the person from NOS responsible for the Control Management Web App, the Scrum Master, the CEO of Ideavity and the Development Team, the Ideavity software programmers that developed all the computer code. On top of the Scrum Team, this methodology introduces the Sales Manager, that even though not directly involved in the Scrum Process is responsible for conceptualizing the control requirements with the Product Owner.

In this project the Agile philosophy extends to the conception of the MCS. As we can see in Figure 1.2, *ex ante* and *ex post* controls are designed and redesigned over time and adapted to the ever changing needs of the company. After a first sketch of the MCS, the Product Owner first establishes, in a prioritized way, a Product Backlog with all these requirements, trying to maximize the value of the product and the work done by the Development Team. After this initial stage is finished, a planning meeting is held with the Scrum Master[4] to define the scope of the Sprint[5]

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[4]The person responsible for coordinating the Scrum Team efforts.

[5]Time-box from the moment a requirement is developed until an increment in the product is created and released.

that is beginning. The releasable software is always subject to adaptation when functionalities and features need to cope with new strategies and goals arising from the company. In the end, when a Sprint is concluded another Sprint immediately begins.
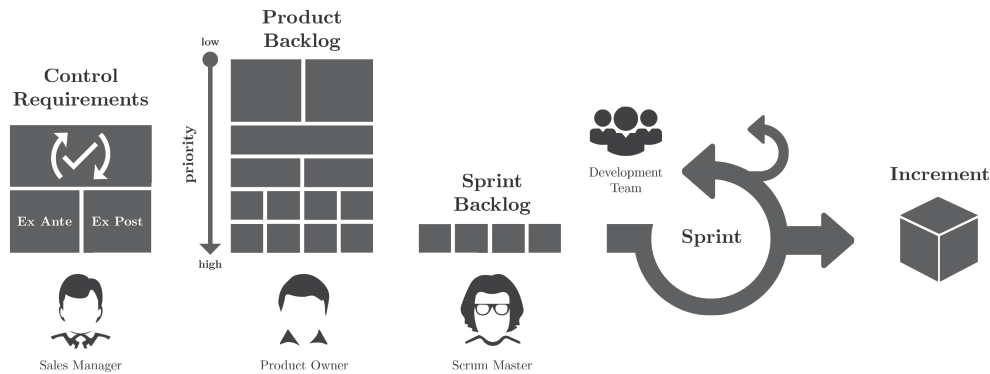
Figure 1.2: Methodology Scrum Based Adopted in the Project

The modules developed are not static features, that resulted from minor variations in the original plan. They are deviations from "required solutions" to "working solution". This dissertation is constructed to evolve from the strategical perspective of the company to the practical implementation of new managerial tools that align the tactical with the strategical scope of the business.

1.5   Dissertation Structure

This dissertation is structured into four more different sections, that will be briefly mentioned in this chapter. Section 2 encompasses a review of the state of the art regarding sales force management, with a literature review on the selling effort and Sales Force Automation, then the development of web-based applications is analysed examining the components of a web application system, furthering the research on Agile, MVP and Scrum methodologies and, finally, Management Control Systems applied to budget control and stock management concludes the scrutiny of the relevant topics related to the problem at hands. Section 3 explores the current situation of the company, giving further information on the characteristics of the youth segment in the telecommunications (telco) market, finishing with a description on the importance of having a web application as a control management tool to solve several business problems. Section 4 describes the two modules of web application, the operational costs and stock, respectively. The conceptualization of the model, the control requirements from a MCS perspective of *ex ante* and *ex post* controls and the key features to be developed are analysed. Section 5 details the Product Backlog used and the implemented features, illustrating some functionalities developed, gives the spectrum of what needs to be done in the future and presents some examples of practical usages for the developed tool. At the end, the main conclusions are presented in section 6, showing the implications of the Control Management Web Application in the overall strategy of the youth segment, finishing with strategical and operational suggestions to be implemented in the future.

Chapter 2

State of the Art

In this chapter key topics relevant to this projects are presented, situating this dissertation in a scientific and technical context. The selling effort and the usage of Sales Force Automation (SFA) systems are described in terms of Sales Force Management giving a broader scope on how sales and technology are related. The development of web-based application is described from a technological and methodological perspective, with a characterization of fundamental Agile principles and frameworks found in the literature. In the end, budget control and stock management practices are presented from a Management Control System perspective (MCS). The literature used gave an academic background for the development and implementation of the two modules in the Control Management Web Application and proved to be an helpful resource to communicate and introduce several relevant topics of the project.

2.1   Sales Force Management

According to Johnston and Marshall (2016) "innovation, technology, and leadership are pervasive themes in sales management today", which means that the sales force process needs to be flexible and cost effective to thrive in the competitive digital economy. According to Andris Zoltners (2004) "the success of any company depends on its ability to acquire and retain customers". In fact, the salesperson is the most direct connection to the customer and managers strive to allocate resources to better spend time and money (Reid et al., 2017). Sales managers see themselves directly involved in the sales process, whereas salespeople see the sales manager as an indirect support mechanism which indicates that adaptability, organization and planning plays a more important role in sales force management than selling knowledge or skills (Deeter-Schmelz et al., 2008). To track the performance of the sales operation it is critical to have a well-oiled Management Control System implemented and adopted unilaterally by the management team. The success or failure of this implementation can represent the difference between profitability or unprofitability.

Last but not least, organizing the sales effort, using the correct information to make managerial decisions and effectively evaluating and controlling the sales program paved the way for the use of technological tools to automate sales tasks and enhance performance in a cost-effective way.

2.1.1 The Selling Effort

To understand the use of new technologies to improve costs and stocks related to the sales process, first of all, it is important to understand the different roles played and how the sales force and the sales managers assess needs, provide solutions and create long-term value in the sales effort (Domingues, 2008). According to Andris Zoltners (2004) the tasks of salespeople can be condensed in four key areas: providing information and selling, managing relationships, collecting market information and disseminating it within the company and, finally, coordinating the sales team. Every actor of the selling effort may be considered as a communication, information, and decision centre constantly interacting with each other in the sales process (Darmon, 2007).

Because of their front-line role, sales forces are the company direct link to the customer (David Jobber, 2015). Their primordial goal is to make a sell but at the same time they represent the main source of information about the customer. The sales manager is the coordinator of the sales effort and its role is to mentor, coach, teach, supervise, manage and lead the sales force through the strategic path and goals defined by the company (Cook, 2009). The sales process is often described as the operation arm of marketing, but recently the value-creating processes within companies began to require close collaboration from these two branches, with it marketing has become more operational and sales department has grown more strategic (Malshe and Biemans, 2015). An effective management of the sales force pays attention to key steps in the performance management process. As seen in Figure 2.1, setting goals and expectations, making plans, taking actions, measuring the performance and evaluating the achievement, establishing new goals in a continuous process of improvement (Andris A. Zoltners Ph.D., 2009).
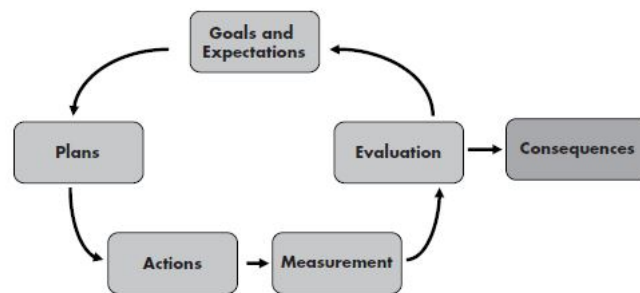
Figure 2.1: The Performance Management Process (Andris A. Zoltners Ph.D., 2009)

Choosing to outsource the sales force or sell the product directly is a crucial decision that the company must make when it is designing the commercial operation. From the savings on human resources to better risk management, choosing to outsource the sales force can provide a strategic advantage to the company. According to Johnston and Marshall (2016) the choice to whether or not outsource the sales force depends on economic criteria, control mechanisms, transaction costs and strategic flexibility. The outsourced partner must feel part of the team and trustworthy relations should be fostered, but to have an efficient control over the sales process the contractor company must track performance closely and have the flexibility to terminate agreements with partners, if

their performance is beneath expectations (Zoltners et al., 2006). Nevertheless, as time goes by, it becomes difficult to reduce the dependence on these partners, making it hard to negotiate and to capitalize the initial synergies that the deal brought to the operation.

2.1.2 Sales Force Automation

Sales Force Automation systems have attracted the attention of prolific figures in the field of marketing since the 80s (Bush and Grant, 1991). Sales Force Automation (SFA) comprises the software and hardware parts of an information system that functions as a technological support to the sales force. They are used by management and sales representative to increase efficiency within the organization, helping to identify "what worked, what did not, and where to double down and spend dollars for greater return on the marketing side" as stated in 2006 by Michael Pilot, Chief Commercial Officer at GE Capital (Ledingham et al., 2006).

SFA applications vary from contact and account management to sales funnel analysis and time management prospecting (Schillewaert et al., 2005). These automatized systems allow improved access to information and enhanced communication with customers, which results in a more efficient sales force with faster revenue generation (Erffmeyer and Johnson, 2001). SFA help reduce the time spent in managerial activities by improving the readability of the information and facilitating the analysis of the data by the managers (m. Widmier et al., 2002). SFA can fail if the organization is incapable of planning and communicating the benefits of the new technology to internal and external collaborators. According to Honeycutt et al. (2005) it is important to identify the business problem and define useful goals to tackle it because if the perceived value and the expected trade-offs of the SFA effort lead to different levels of commitment from management teams and sales force personnel, the implementation of SFA becomes compromised. Finally, it is important to evaluate and define metrics to assess if constantly adding new technologies is creating value or if, on the contrary, the company entered in a vicious cycle of money and time expenditure updating technology with no clear path or strategy.

The development of new technologies in the computational field allowed small devices to do what was traditionally done by larger personal computers. This increased mobility led to the development of mobile SFA systems that rely on mobile devices to support the sales function, creating the possibility to retrieve data by using smartphones or tablets while being on the road (Karjaluoto et al. 2015). This new approach to SFA paved the way for web-based applications to be implemented in SFA adoptions as a cost-effective solution to the problem.

2.2 Development of Web-Based Applications

In 2016, the number of Internet users worldwide reached 45% of the world population, which represents a growth of almost 30% compared to the year of 2005, as seen in Figure 2.2. According to Pordata (2018b), in the year of 2017, 71% of the Portuguese population over 16 years old accessed the Internet, on average, at least once a week, which is still 10% lower than the European average. In terms of enterprises the number is more favourable, with 98% of Portuguese companies

with 10 or more employees, already having Internet access, which is above the European average (Pordata, 2018a). A wave of connectivity broke through our lives, to never go back.
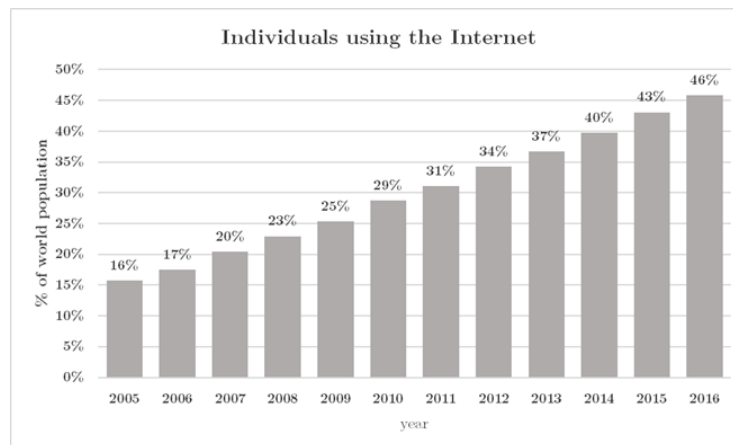
Figure 2.2: Percentage of Individuals Using the Internet in the World (Union, 2018)

The growth of the web in the last decade changed the economic landscape and forced companies to adapt to this new paradigm changing their business towards quicker, cheaper and easier ways of management (Zambonini, 2012). The Internet economy is emerging, and all economic sectors will be affected in some way by technological disruptions fuelling new ideas and business models, creating opportunities not yet imagined. As the 2017 Internet Society Global Internet Report states, eventually, "making all companies technological companies".

One of the most important transformations that the Internet brought in terms of business opportunities was the possibility to develop software that could be available in every platform without the need to install desktop applications (Fowler and Stanwick, 2004). The shift from a client-based application that involved installation files typically downloaded from a website to a browser-based application that only requires access to a web browser[1] with Internet connection, allowed programmers to develop new businesses directly from the web (Hur and Christian, 2017). In a time where Internet access is widespread, and devices like smartphones, tablets or computers can easily be connected to the network, web applications offer cost-effective solutions to exchange information between users, creating new forms of collaboration across different platforms (Zambonini, 2012).

2.2.1 Components of a Web Application System

A Web Application is a client/server application accessed anywhere in the Internet through a notation scheme called URL (Uniform Resource Locator) that identifies a unique web page, presenting dynamic content based on request parameters, tracking user behaviours, and security considerations (Shklar and Rosen, 2003). The web application follows a client/server architecture that reflects the interactions between the client and the server. The client is the web browser used to access and run the web application through a hardware device[2] that is connected to the Internet.

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[1] Google Chrome, Microsoft Edge or Mozilla Firefox.
[2] Laptop, desktop computer, smartphone, etc...

The web browser communicates across a network and makes a request that is processed on remote machines called servers. The exchange of information between servers and users is done using the HTTP protocol (Hypertext Transfer Protocol), the so called "language of the web" that allows the transmission and creation of web pages based on the TCP-IP protocol[3]. Since these data communications protocols are already installed in the client operating machine as part of its operating system, the client/server applications connectivity features do not have to be directly included into the client program, enabling the creation of "lightweight" applications that eased up the fast growth of the World Wide Web.

According to Shklar and Rosen (2003) web applications use two types of scripting to request and response information across the network, the client-side script like HTML or JavaScrit that runs on a local browser and a server-side script like ASP or PHP that runs on a web server. The client-side script is usually used for interface processing and the server-side script for data storage. The client-server architecture is usually multi-tier with three distinct pieces, as seen in Figure 2.3:

The Client Tier   The first tier consists in all the devices that host a web browser, providing a friendly and comprehensive front-end display that enables responsive interaction with the user. This tier hosts the presentation layer components.

The Application Tier   The second tier consists in servers that store, process and deliver web pages to clients, optimized to provide a good and secure network connectivity. This tier hosts the business layer components. In this tier its possible to have web application servers that expose the business logic, moving and processing data between the two surrounding layers, the presentation and the data layer. This layer is the software realization of business concepts that matches the need of a particular company to the solution developed.

The Data Storage Tier   The third tier consists in a back-end database that stores all the information, so that it can be accessed in a dedicated server, without compromising sensitive information regarding corporate assets. This tier hosts the data layer components.

2.2.2   Agile and MVP

The growing importance of the Internet economy and the expectations around software products combined with the need to have agile responses to market needs led to the development of new methodologies maximizing the potential of software development teams using communication tools, self organization, flexibility and innovation rather than planning and standardization of processes (Selvi and Majumdar, 2013). This circumstances culminated in the outbreak of the "Agile Movement" in 2001, when the Software Development Manifesto caught the attention of the software industry presenting the following principles:

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[3]The name TCP/IP refers to the Transmission Control Protocol (TCP) and the IP (Internet Protocol), but the suite is comprised of many other significant protocols.
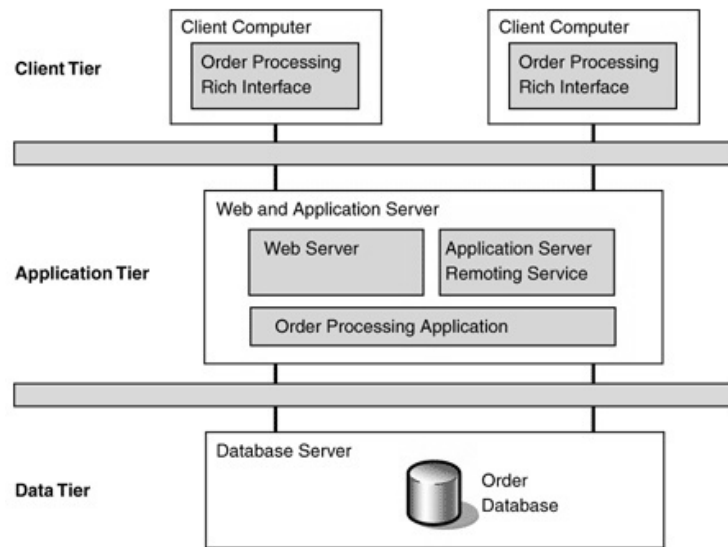
Figure 2.3: Three-Tiered Distribution (Microsoft, 2014)

- *Individuals and Interactions* over processes and tools;

- *Working Software* over comprehensive documentation;

- *Customer Collaboration* over contract negotiation;

- *Responding to Change* over following a plan;

This principles were people oriented, adaptive and promoted a collaborative, communicative and iterative working style focused on value-oriented results (Miller, 2001). Agile methods reduce the cost of change, through constant iterations, two to six-week range, with constant feedback from the user, producing simple solutions able to adjust to new requirements with an intense focus on effectiveness and manoeuvrability (Highsmith and Cockburn, 2001). According to Highsmith (2010b), Agile redefines the traditional iron triangle and suggests three new end points: value, quality and constrains. The constrains encompass the traditional scope, schedule and cost, the quality is about the continuous delivery of reliable and adaptive software and the value measures are about how the released deliverable corresponds to the customer expectations and needs. An illustrative figure of the Agile triangle can be found in Figure 2.4.

From a client perspective the Agile methodologies are in line with the concept of Minimum Viable Product (MVP). This concept states that to avoid time and money waste when a new feature is introduced in the market, software development should be focused in a minimum amount of core features that maximize the needs of the client, instead of developing useless software to support all the customer requirements (Ries, 2011). This philosophy is used by start-ups to gain flexibility and compete with more resourceful companies.

Value
(Releasable Product)

Quality
(Reliable, Adaptable
Product)

Constraints
(Cost, Schedule,
Scope)
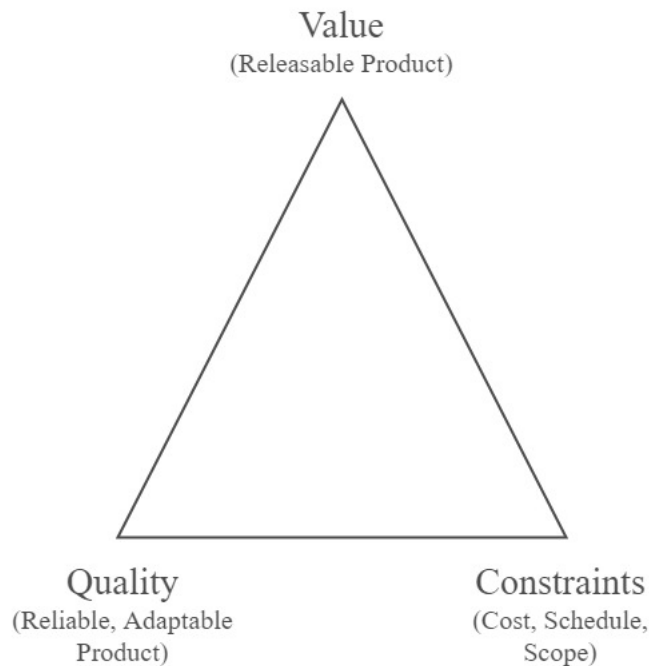
Figure 2.4: Agile Triangle (Highsmith, 2010b)

2.2.3 Scrum

One of the most popular and widely used framework to implement Agile methodologies is Scrum (Sharma and Bali, 2017). Scrum is a framework to develop and sustain complex products, helping software developers to employ various processes and techniques to create the maximum possible value in a continuous and adaptive way (Schwaber and Sutherland, 2016). 'Scrum' is a term originally used in Rugby that means "getting an out-of play ball back into the game" (Schwaber and Beedle, 2001). While Agile describes some guidelines and principles for building software through continual development, Scrum is a more practical approach that follows a specific set of rules to manage unpredictable and complex software projects (Abrahamsson et al., 2002). The Scrum framework, shown in Appendix B, represents the Scrum's artefacts, namely the Product Backlog, the Sprint Backlog and the Increment:

Product Backlog   It represents the list with the key features, function, requirements and changes to be made to the product. The sole person responsible for this artefact is the Product Owner, whose job is to maintain the Product Backlog assuring that the value of the product is maximized according to the needs of the organization. As Schwaber and Sutherland (2016) state, "the Product Backlog is never complete" because it evolves with the product needs.

Sprint Backlog   It represents the adaptable plan of all the work that must be done during the Sprint and it paints a picture of what is being developed to meet the Sprint Goal. The Development

Team is responsible for updating the Sprint Backlog and delivering a "done" product at the end of each Sprint.

The Increment   It represents the new functionality that is delivered in the end of the Scrum process. Everyone from the Scrum Team is responsible for delivering a product in usable conditions that maximize value for the organizations involved in the project.

All the work is done in Sprints, an iteration of development efforts with a project-life-cycle span between 3 to 4 weeks (Selvi and Majumdar, 2013). The Sprint initiates with the Sprint Planning, where the plan to meet the Sprint Goal is defined, based on the objectives set in the Product Backlog. On a daily basis, the Scrum Team gets together in 15 minutes events called Daily Scrums. When the sprint ends a Sprint Review is held to present the product to the Product Owner and to adapt the Product Backlog, if needed, to new requirements and needs to be addressed in the next Sprint. Prior to the next Sprint Planning and after the Sprint Review, improvements to increase effectiveness are discussed in the Sprint Retrospective that focus on inspection and adaptation, to improve the quality of the next Sprint (Schwaber and Sutherland, 2016).

Last but not least, the Scrum Team, composed by the Product Owner and the Development Team, needs a Scrum Master to lead the Scrum effort and maximize the interactions between all the people involved in the project. The Scrum Master is also responsible for ensuring that everyone involved in the project knowns the Scrum framework and that its implementation in the organization corresponds to the expected benefits that were originally defined (Mahnic and Drnovscek, 2005).

2.3   Management Control Systems

From the managerial point of view, in the back-end process of the commercial operation, a Management Control System (MCS) helps to assure that the strategy and plans of the company are carried out according to the outcomes they expect to achieve (Kenneth Merchant, 2007). MSC applied to planning and budgeting analysis of the commercial activity of a company is a mean to evaluate and control the sales force performance and it is used by the sales manager not only to "monitor" costs and to record data, but also to analyse the data and take action before the company incurs in significant losses (Kerzner, 2009). Shklar and Rosen (2003) state that MCS are tools to help management lead its company forward and towards its strategic objectives gaining advantage over its competitors. Keeping this in mind, it is possible to conceive that to reduce inaccuracy and inconsistencies in the information that is gathered, a web application can be used as a tool that once programmed, keeps track of commercial transactions without any sort of bias (Kenneth Merchant, 2007). In fact, automatizing certain functions in MCS helps to avoid thefts, frauds or unintentional errors (Kenneth Merchant, 2007).

The correct implementation of the MCS in the business is very important to ease the difficult managerial task of handling expectations because, as Shklar and Rosen (2003) state, when the

salespeople perceive a control management system, they are less likely to share ideas with managers, which raises the question if the manager should increase the control over the sales force or, on the other hand, should create mechanisms to increase the sales personnel contribution to the sales effort.

Coller et al. (2018), borrowing a concept from software development literature, suggest an Agile implementation of MCS, more flexible and receptive to change. MCS and strategy evolve over time and influence each other with a dynamic of change. This intertwine between MCS and strategy creates a final product shaped through implementation where the initial requirements suffer several refinements, adapting and evolving to fit strategical concerns that can be translated into MCS components. In this approach, the MCS should be people centred with recursive transitions through the several stages of the project, because in this type of processes predictability is very low.

2.3.1 Budget Control

Estimating costs are part of companies daily life and budgeting is a "near universal organizational process" (Cook, 2009). This short-term financial planning includes the costs of direct selling, inventory, advertising, sales promotion, administrative costs, commissions, bonuses and other rubrics (Johnston and Marshall, 2016). The sales manager is responsible for its implementation, control and understanding, according to the way costs are allocated, the profitability of a point of sale, a demographic area, a product or a market segment.

Costs can be allocated in three ways: full costing, contribution analysis, and activity-based costing (ABC). Choosing the best approach is an important decision that sales managers need to do because, if budget allocations are not done properly, incorrect strategic decisions can jeopardize the company in the future (Johnston and Marshall, 2016). In terms of cost allocation, the full-cost approach holds that all the costs related to the business should be allocated to one operating segment, the contribution margin holds that only costs that can be identified with the segment of the business can be deducted from the revenue produced by that segment and, finally, the activity-based costing holds that resources should be identified and then assigned to each activity that is performed to offer a product or service to the customer (Johnston and Marshall, 2016). There is no optimal way to allocate costs and the sales managers must look at the business characteristics, decide the best method and bear in mind that his choice influences the analysis of the strategic path that will be taken.

2.3.2 Stock Management

Logistics is defined by APICS, an organization for the supply chain management, as "the art and science of obtaining, producing, and distributing materials and products in the proper place and in proper quantities" (F. Robert Jacobs, 2018). The decision of how to transport goods affects the cost of a product and coordinating activities to better allocate resources, manage inventory levels and track the material, helps to increase operational effectiveness. The flow of materials in the

supply chain is the main scope of logistics and the terms logistics and supply chain management, semantics excludes, have broadly the same meaning (Waters, 2003).

In the supply chain, carefully managing inventory levels is an important function to remain competitive (Bozarth et al., 2016). Stocks, the materials held by organizations to give a buffer between supply and demand, create the necessity to have inventory systems implemented to allow the highest service level with the lowest cost (Waters, 2003). One of the most commonly used inventory system is the periodic review system that restocks at regular intervals to achieve a pre-defined inventory level (Bozarth et al., 2016). According to Waters (2003), "the operating cost of this system is generally lower and it is better suited to high, regular demand of low value items". The formula to calculate the order quantity is described below.

$$order\ quantity = target\ stock\ level - stock\ on\ hand$$
$$target\ stock\ level = mean\ demand \times (T + L) + safety\ stock \qquad (2.1)$$
$$T + L = order\ interval + lead\ time$$

Last but not least, inventory management requires that the moving goods are valued according to some metric. Logistics usually deploys three types of costing, the First-In, First-Out (FIFO) method, the Last-In, First-Out (LIFO) method and the weighted average method (Waters, 2003). The FIFO method assumes that the first sold items are the first items bought, the LIFO method assumes that the first sold items are the last items bought and the weighted average method looks at an average cost over a period of time (Waters, 2003).

Chapter 3

Problem Description

In this chapter the problem that this dissertation aims to resolve is presented from a broader strategical perspective of the youth segment in telco to a more concrete focus on the tool that was used to develop the implemented solution. The first part of this chapter describes the market, the commercial operation and opportunities and growing pains of the youth segment at NOS. The second part describes the situation of the Control Management Web App when the project began, the difficulties and challenges that lead to the implementation of the new modules and how the solution found was initially approached.

3.1   The Youth Segment in the Telecommunication Market

During 6 school years, from 2010 to 2017, FAQtos[1] conduced inquiries in Portuguese schools to access the number of SIM cards used by secondary grade students. The responses were staggering; in 9091 answers, only 39 students said that they did not have a cellphone (Catarré and Correia, 2018). This is corroborated by the latest data from Instituto Nacional de Estatística (2013), that states that, in Portugal, the youth segment has the highest percentage of mobile phone usage. This segment has grown up living in networks, surrounded by technology and proclaiming self-assertion and independence, causing disruptions in the market, forcing companies to adapt their business models to new consumption patterns. To cope with these changes, telco operators designed new strategies to communicate with the segment. From developing a separate brand, with an exclusive marketing and sales departments, to redefining and adjusting the product offer, they created mechanisms to capture new sources of revenue from the youth segment.

3.1.1   Market Description

An effective segmentation of the customer base is essential to understand customers and maximize the service offer (EY, 2013). Strategies focused in the customers are the best way to beat competitors and closer engagement with market segments is fundamental to achieve good and sustainable

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[1]FAQtos is a project developed by two public Portuguese research institutes with the purpose of providing relevant information regarding electromagnetic radiation in mobile communications.

results over the years. Since the youngsters represents clients with specific needs and aspirations, telco companies carefully segmented these customers to offer products that could maximize their satisfaction and create long-term value. The importance of the youth segment in telco can be summarized in three main points:

- The demographic dimension of the youth segment represents an important source of revenue. According to Instituto Nacional de Estatística (2016), the age group from 5 to 24, represents 20.5% of the Portuguese population. This means that, assuming that everyone in this age group is a potential customer, the youth segment could represent a market value of 250 million/year. Taking into account the importance of this market branch, the three main Portuguese players in telco[2] developed specific brands and offers[3] to better communicate with this specific segment. This unique approach to market segmentation represents the importance telco companies give to the youngsters.

- The transition of this segment to adulthood represents a new source of profit for the company. According to Cardoso and Barbosa (2018) "the consumer society is also the society of learning to consume, of social training in consumption" which means that, in the company perspective, being present in this segment can help shape their future consumerist behavior. Nevertheless, telco companies realized that the transition from youth to adulthood was becoming more and more sinuous and erratic, and the once linear path from youth to adulthood was now a complex and intricate back and forth in terms of autonomy and monetary independence, creating "yo-yo transitions" that generated instability (Cardoso and Barbosa, 2018). To smoother the transition in terms of brand positioning, the company felt the need to establish an emotional connection, early on, that could be exploited in the future (López Blasco et al., 2003).

- They influence family and friends to buy other products of the company. Young people have influence over a series of consumption decisions in the household. Their perception on specific products is a relevant insight for their parents and their behaviour, especially regarding technological gadgets and they create new consumption patterns soon imitated by the entire family.

The readiness of the segment to join campaigns was extremely low, due to the network effect that was felt in the market when the brand was launched. The brand "WTF" was inspired in an English slang word used to express amazement, representing the irreverence and attitude of the target, ranging from 6 to 25 years old, which was trying to be captured. With a record of disruptive contents and a strong presence in digital media, the brand has, several times, forced its competitors to be followers, setting the pace of the market with aggressive offers, benefits and campaigns, providing the best customer experience in the market, leading in functional and emotional attributes. A good example of this is the partnership with NOS Cinemas, that allows

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[2]NOS, Altice and Vodafone
[3]WTF, Moche and Yorn

exclusive discounts on more than 220 cinema rooms. Nevertheless, and even though the brand is well positioned as an experience provider, the effectiveness and aggressiveness of the commercial activity has been the main source of growth for this segment. This commercial focus aligned with an optimal allocation of resources lead to a continuous increase of the customer base and the profit margins.

To conclude, the youth segment in NOS is maturing and in the upcoming future, the commercial operation will probably suffer some changes. After the initial seed, the business experienced a continuous growth and has expanded its operation until it has established itself in the market. In the moment it seems to be in a maturing stage and the market is starting to be saturated. This requires the development of new solutions to capitalize on the situation and provide a continuous reduction in costs and operational inefficiencies to prepare the business for an eventual and somehow inevitable last stage in the product life cycle stage, its decline.

3.1.2 Commercial Operation

Maximizing sales must be a responsibility of every department within the company because a lost sale represents a missed opportunity to grow (Leonard, 2018). In fact, it is safe to say that setting an efficient and effective sales operation is the best way to strive in the competitive business environment and grow to be a market leader. In telco, the competition is ferocious and, especially in the youth segment, where the customer loyalty is very low, it is extremely difficult to increase the customer base without a commercial operation set to turn new customers into Revenue Generating Units (RGU). Implementing a successful commercial operation to sell a mono-product like this stand-alone mobile tariff, it is not an easy task for two main reasons:

- All the sales force is sub-contracted to temporary employment agencies. This decision follows the strategy of the company to building flexible commercial operations with a small amount of human resources. Nevertheless, this conditions the strategy of the youth segment because, in the long-term, the bargain power diminishes and without careful and efficient planning, the dependency to these third parties can be harmful.

- The age of the salespeople is usually within the range of the customer target, which means that the sales force is very young and in most cases with a low sense of responsibility. Associated with the fact that most of them work on short-term contacts, assuring the quality of the selling process based solely on self-control of the sales force, becomes impracticable. This being said, the structure of this model requires constant supervision to take immediate action when deceitful sales are identified.

This commercial operation presents more points of difference than points of parity when compared to the traditional retail operation set by NOS. In fact, the service offer for the youth segment is unique when compared to other products provided by NOS because it has an exclusive marketing and sales team focused in selling this single product, while the rest of the sales and marketing departments usually sell multiple products with shorter life cycles. The commercial operation is

concentrated in Porto and Lisbon but it spreads demographically throughout the country, as illustrated in Appendix A, Figure A.3. In terms of Points Of Sale (POS), since the beginning of the operation, they shifted from movable POS in schools, universities and beaches with a sales force focused in brand activation[4] to fixed POS in shopping centres and NOS stores, with a purely commercial orientation[5]. The different POS are described in Table 3.1 with illustrative figures included in Appendix A, Figure A.4.

Table 3.1: Description of the different types of POS and the number of salespeople allocated

Type of POS	Stand	Regularity	Nº of Salespeople	Nº of POS
Shopping Centre	Fixed	Everyday	2 or 3	13
NOS Store	-	Everyday	1	from 8 to 17
Street	Movable	Sporadic	2	n/a[a]
University	Movable	Sporadic	2	n/a[a]
Events	Personalized	Very Sporadic	from 2 to 8	n/a[a]
Others [b]	Movable	Sporadic	1 or 2	n/a[a]

[a]Not applicable.
[b]High schools, beaches and cinemas.

Every sales follows a simple process. People circulating around the POS are approached and questioned if they already know the WTF brand. Thereafter, the salesperson inquires if the customer is within the age of the target and then gives a brief explanation about the product and service, using flyers and low-cost gifts to convince the customer. If the salesperson closes the sale, he activates the SIM card through an automatic line that cross validates the customer ID with a database, verifying the age. The client pays an initial top up and the salesperson delivers the SIM card activated, along with a premium gift. In the end, the sale is registered in the App Dealer. After the client adheres the campaign, he has access to three months with free top ups in the high price plan of the tariff. This provides unlimited mobile data in certain "apps", 5000 minutes of calls, free SMS and, on top of all that, cinema discounts and other benefits of temporary promotions. When the three months campaign is over the client can remain in the high price plan, change to another price plan or simply leave. Churn[6] is a very important metric to assess the performance of the product as a whole and when it increases, the Sales Manager sees this as an indicator that the commercial operation might be underperforming in terms of quality. Lower customer retention rates put pressure on the commercial operation to have more control over inefficiencies and to develop management tools to track and act over the sales force, having the flexibility to enforce the company strategy of growing with quality.

[4]Operation with the main goal of communicating and promoting the brand to the target.
[5]The brand activation now shifted to a continuous commercial operation oriented to sales.
[6]The percentage of clients that are no longer active users, compared to the previous month.

3.1.3 Opportunities and Growing Pains

The business is currently struggling to maintain its customer base and to find new ways to grow as it once did. Throughout the last couple of years, the good performance of the commercial operation, aligned with the more recent decision to allow the integration of the youth mobile tariff in the residential monthly bill, brought comfortable results and a stable increase of the customer base. Nevertheless, unexpected oscillations in Churn puts pressure on the management team to present better results to the board of directors. Facing monetary restrictions, the Sales Manager set the following goals:

- Increase the focus in commercial management and quality sales.

- Be more efficient in terms of planning.

- Optimize resources and reduce the operational workload.

To achieve these goals, a plan was designed to increase agility and quickness in decision making. The plan consisted in introducing new features in the Control Management Web Application to help develop the business and boost the efficiency of the operation. On top of that, the sales team was redefining the logistic operation of supplying the different POS with SIM cards and gifts to reduce the time that supervisors spent doing this task, allowing them to focus on the sales process exclusively. In sum, the line of action was:

- Manage the entire cost structure of the commercial operation using the Control Management Web Application.

- Redefine the logistic supply process of SIM cards and gifts and integrate it in the Control Management Web Application.

With this, the commercial team was hopping to respond to the needs that were starting to arise and act accordingly. This required that efficient management tools and processes were defined and implemented in the Control Management Web Application to put all of this into practice.

3.2 Control Management through a Web Application

The evolution from the small commercial operation when the product was beginning its life cycle, to the sizeable commercial operation that is set today, has only been possible because a Control Management Web App was implemented and fully adopted by the sales force and the management team. At the time, the company faced a dilemma of either contracting an external software development team or developing the software internally. In the end, the company decided to contract Ideavity, a long-time partner experienced in the Agile philosophy, to develop the software. They were already working for the youth segment in the WTF website, creating a trustworthy relation with the company. Moreover, the management team did not want the project to be developed based

on a waterfall approach[7] and in the end of the day it was clear that with the constant changes faced by the commercial operation, the model chosen needed to have as much flexibility as possible.

3.2.1   Current Situation

The Control Management Web App is a management tool used to enforce the Management Control System (MCS) set internally to keep track of the commercial operation. Its implementation allowed real-time control over the operation and created a planning and analytic component that to this point was unattainable. By employing it the Sales Manager can act much more efficiently when needed.

Built over a client-server architecture multi-tier, a web application was the solution found to deliver a tool easily accessed from every device. As we saw early in Chapter 2, web application are cost effective solutions to exchange information, available at almost every digital platform without installation procedures. The Control Management System was built to have two interfaces, the App Dealer and the Back Office:

APP Dealer   This is the front-office used by the sales force in the commercial operation. Smartphones provided by the company with Internet connection and GPS location are used to access the web application. To register a sale, the salesperson must first login and then check-in into a POS to access the Sales Area. In the Sales Area it is possible to register all the sales that are made. POS are recognized using the smartphones GPS location and the salesperson chooses, from a list of nearby POS locations, the one where he will work. When this process is completed, every sale that registered will be automatically associated to a specific salesperson and POS. With the check-in, the salesperson can register its daily sales in the App Dealer, the final stage of the sales process as seen before. Upon submission that information is stored in a database and updated in the system. By doing the check-in it is also possible to access the sales record and see the POS sales objective for the day. Last but not least, rankings with the top performance salespeople can be seen here too.

APP Back Office   This is the back-office used by the management team and the supervisors to control the commercial operation. Using real-time data retrieved from the App Dealer, it allows an effective control over the performance of each POS utilizing a dynamic sales dashboard, as seen in Figure 3.1, and also gives the possibility to extract Excel files containing the check-ins of the salespeople, sales reports and sales summaries. Currently, these tools are essential to evaluate how the operation is going on and to assess the POS that are underperforming, to take immediate action, pushing the sales force toward better results, easily adapting the operation. Before this project was implemented, there were two types of users in the Back Office: The user *admin* and the user *supervisor*. The user *admin* was destined to the management team and the user *supervisor* was destined to the supervisors of the sub-contacted agency. As seen further on, a third type of

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[7]Sequential design methodology where the process flows "downwards" like a waterfall in a non-iterative way. In software development, this approach tends to be ineffective when adaptability to change is required (Awad, 2005).

user was introduced when costs were implemented in the Control Management Web App. Each one of these persons have different clearance levels according to role they have in the operation. A description of this clearance levels can be found in Appendix B, Table B.1. The user *admin* and the user *supervisor* have access to the same critical data of the operation to help make quick and immediate decisions, saving valuable analysis time that can be used to coach the sales force to improve the selling effort. The management team and the agency supervisor uses the Control Management Web App not only to oversee to performance of his salesperson but also to plan weekly routings and fill supervision reports about the POS that was visited. The main difference between these two users lies in the access they have to the data: while the user *admin* has access to all the database, the user *supervisor* is restricted to the information related to the sub-contracted agency. Even though the Back Office can be accessed from every device, it was designed to be accessed from a computer.
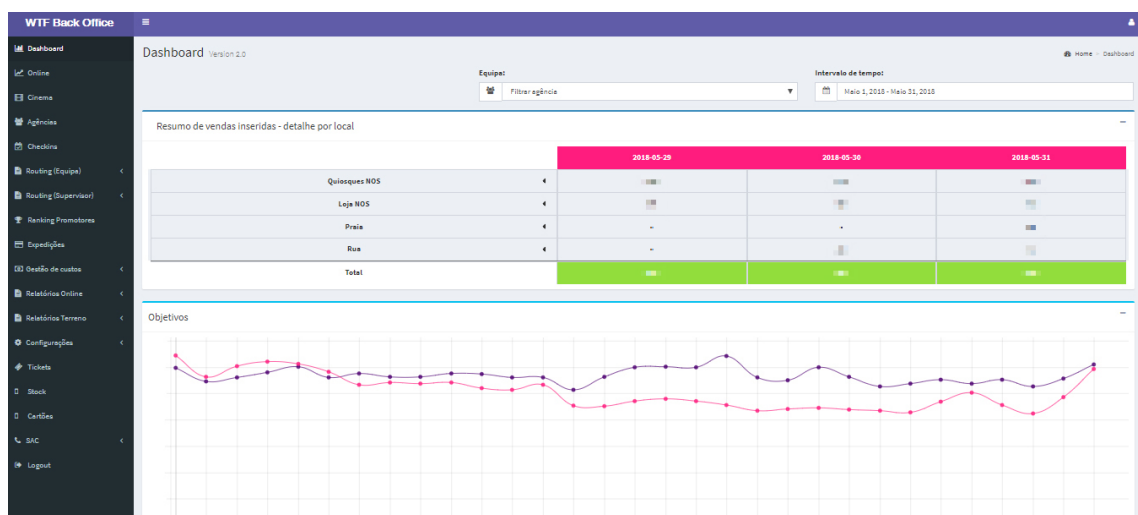

Figure 3.1: Control Management Web Application Dashboard

A diagram summarizing the main features in the Control Management Web App can be found in Figure 3.2.

Having real-time feedback allows the company to adapt its sales strategy, giving the Sales Manager more control over the sales process. Decisions are taken more quickly, adopted earlier and salespeople save time that otherwise would be spent updating and reporting information to management. Using the data retrieved, a ranking of top performance salespeople is set to engage them in the selling effort and, in the end of each budgetary period, the Sales Manager rewards their work.

Last but not least, the Management Control Web Application crosses internal information retrieved from the company database with the web application database. With this it is possible to evaluate if the sale that was inserted has the correspondent initial top-up done, and if so, the system indicates that the inserted sale is confirmed. The confirmed sale is the metric used by the Sales Manager to conduct an internal analysis on the overall selling effort.
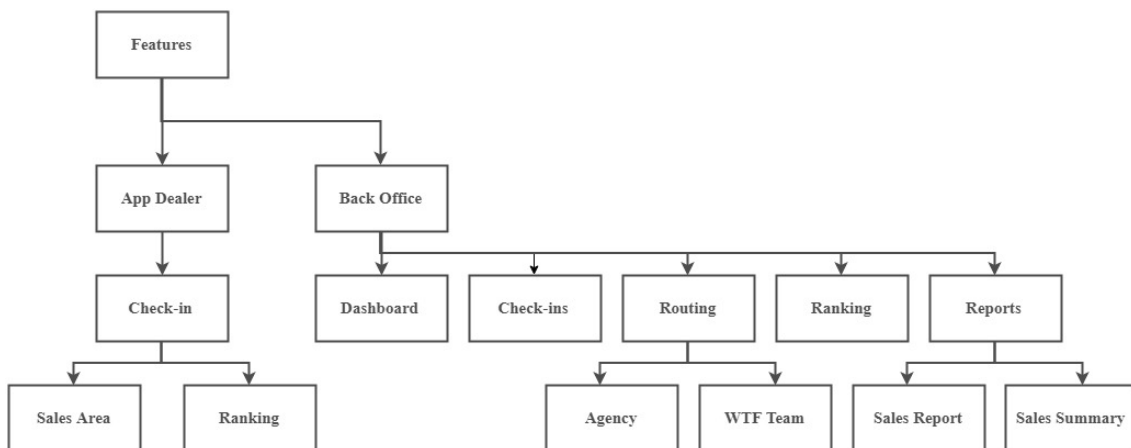
Figure 3.2: Diagram of Features for the Control Management Web App

3.2.2 Difficulties and Challenges

The company assigns budgets based on the customer base; for the marketing team they look at RGU and for the sales team they look at confirmed sales. Each confirmed sale can be a Gross Add (GA) if it exists an initial top-up with SIM card activation[8]. The GA then appears as a RGU if the client is an active user. This process once again demonstrates the importance of a close collaboration between sales and marketing since the commercial operation sustains the customer base and if the commercial operation budget is affected the marketing team resents in their own budget because, without new customers, the RGU will automatically decrease due to Churn.

The growth of the customer base aligned with the expansion of the commercial activity increased the budget assigned to the youth segment, but in the last couple of years the business matured and there was the need to allocate those resources in the most efficient way as required to continue the path of growth. At this stage, inertia was not an option, the management team had to make decisions on whether or not continue in certain POS to have a better control over the expenditures of the operation. The sub-contracted agencies were spending too much money in certain cost categories such as salesperson, supervision, rents or gifts and the management team, using only Excel sheets, spend huge amounts of time analysing and characterizing all these costs to distribute them by agency and type of POS, having only then the big picture on how the operation was going. The sub-contracting agencies received an agreed-upon fee over the total cost of the operation and despite all the efforts made by the company, the fact was that the incurring costs of the operation were somehow inflated by the agency and the exercise of controlling what was being paid proved to be a laborious and excruciating effort.

With the project to redefine the logistic supply process, the management team knew that this

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[8]A GA is always a confirmed sale but a confirmed sale might not be a GA. Sometimes the client doesn't have his identification with him and, after the initial top-up is charged, the SIM card is only activated after the sale is concluded. In this case, the salesperson delivers the SIM card and the activation is done by the client, later on, using his identification to confirm his age trough the automatic line. The fact is that sometimes this activation is not done and then the confirmed sale is not converted into a GA.

project would not only help increase the operational effectiveness but would also allow a better accounting over promotional gifts expenditures. The Control Management Web Application would have to integrate all the information concerning budgets and then allocate the costs into three categories: Agencies, Type of POS and Category. On top of that, the logistic supply process was designed to be managed through the Control Management Web Application and it was necessary to associate the inventory with the sales process, since each gift and SIM card that was discounted was tied to a sale stored in the database. To have a real-time view of the operational costs using the Control Management Web App, the budget information had to be linked to the sales, the supervision routing and the newly introduced logistics supply process. The main concern of the Sales Manager was that this project was overshadowed by other work that Ideavity might need to do for the WTF website. To manage everything, assuring that the sales team plan was implemented quickly, according to the strategic goals of the company, new requirements and features had to be developed using an Agile philosophy, maximizing the collaboration with the software development team, not acquainted with the business needs of the company.

3.2.3 Solutions Approach

The Control Management Web Application was a game changer that boosted the efficiency and effectiveness of the commercial operation in the youth segment. In fact, as we saw early in Chapter 2, SFA systems increase the readability of information and are tools to have faster revenue generation from the sales force. In this business, the unilateral usage and adoption of the SFA system both from the management team and the sales force dictated the success of this project. Nevertheless, the implemented MCS was not enough to fully correspond to the business needs of the company. When the product began its life cycle the operation had less costs and far lesser efficiency. To give an idea, the total cost of the operation from 2013 to 2017 increased 780% and the cost per client decreased 94%. Analysing the early variation from 2013 to 2017 in Figure 3.3b and 3.3b it is possible to see that the total operational costs have a peak in the first two years of activity and then stagnate, while the cost per client has been progressively diminishing. This greater efficiency results in the bigger commercial orientation that the brand now has, much more focused in acquiring new customers instead of focusing time and money activating the brand.

Nevertheless, with the expansion of the commercial activity in terms of demographic dispersion and periodicity, it became difficult to access and measure how the business was performing in terms of budgeting. Concerns and doubts on how the business was going to behave in 2018 began to arise in the executive commission heads. The results were good, but the business was entering in a maturing stage and it was time to optimize processes and reduce the operational load of the operation. To keep the trajectory of diminishing the cost per client the management team had to get a better accountability in terms of expenditures and redefine operational processes, especially when it came to the dispatch of SIM cards and promotional gifts to the POS. Once again, management turned to the Control Management Web Application to solve these strategical business issues.
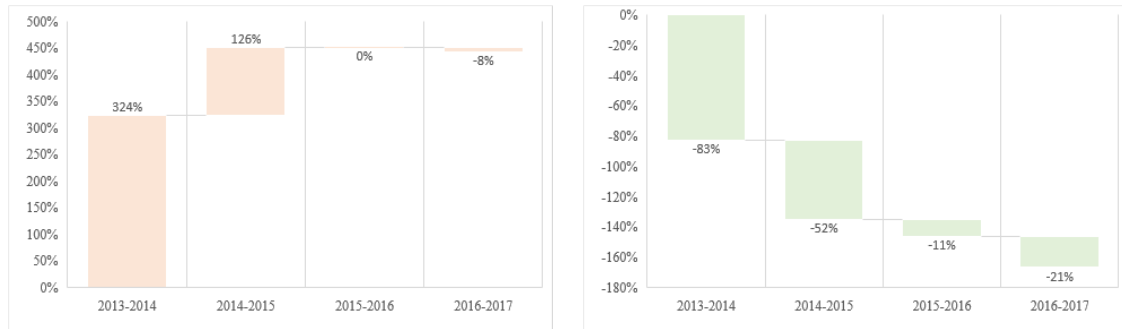
(a) Variation (%), from 2013 to 2017, in terms of total operational costs

(b) Variation (%), from 2013 to 2017, in terms of cost per client

Figure 3.3: Yearly Variation (%), from 2013 to 2017, in terms of Operational Costs and Cost per Client

There is an urging need to implement new features in the Control Management Web Application to support operational costs and stocks management. This implementation will allow better decision making and control over the overall selling effort. Once again, the management support is fundamental to communicate the importance of this project to the sales force and even the marketing team is aware that a successful allocation of resources in the commercial operation will positively impact the customer base and their own budget. Gathering information about the cost structure, defining the business requirements to be met, implementing, testing, making the software available and evaluating the results was necessary to assure that everything was going according to what was originally planned.

By using Scrum as a methodological framework to develop this project the management team adapted the software tool to their needs, instead of developing several features in a four months span and then find out that what was developed did not correspond to their expectations. According to the MVP concept, the software development team focused in developing a minimum amount of useful software in a minimum amount of time, to maximize the core requirements and be able to adapt to certain issues that were not originally considered. This way, as the project developed, certain questions began to arise upon the designed requirements. This dynamic and iterative way to develop a MCS enhances continuous improvement trough use, tightly couple by the changing strategy and environment of the company. Since its strategy is conditioned by unforeseen events, the features to be designed are non-linear and non-sequential and their priority depends on the urge to respond to current problems at hand. This approach is people-centred because the MCS tries to respond to their worries and needs instead of having procedures as guides.

Chapter 4

Modules Requirements

In this chapter the requirements for the project are presented introducing what was planned to be implemented in the the Control Management Web App in terms of MCS. The chapter begins with an introduction of how the modules were conceptualized using the Scrum methodological framework and then defines MCS requirements, namely *ex ante* and *post ante* requirements, that divide the MCS into preventive actions to modify behaviours and corrective actions to inform and give feedback to support decision making. In the end, key features to be developed in the Control Management are presented as guidelines to the implementation process.

4.1   Module Conceptualization - Operational Costs and Stocks

As seen previously in Chapter 3, this project has an important role to play in the strategic prospect of the company for the youth segment. The usage of the Control Management Web App arises from ever-changing business requirements that the operation faces in its daily activity and the concept design for new modules considers the practical implementation of the developed features and pinpoints the human component of the established solution.

The project was carried out using the Scrum framework as a working methodology and the Agile philosophy as a common thread to guide the process toward its goals, described early in Chapter 1. After addressing the issue with the management team, the role of the Product Owner and the Scrum Master was defined, according to the characteristics of the project and the functions and responsibilities of each actor. The roles defined were the following:

- Scrum Master

    The Scrum Master remains accountable for the design, development and security of the client/server architecture in the Control Management Web App. He acts as a coach of the Scrum Team and establishes a bridge between the Development Team and the Product Owner. Finally, to assure the timely release of "done" increments in the end of each Sprint, he needs to coordinate with the Development Team to figure out the best way to solve any technical issues directed related to the Control Management Web App.

- Product Owner

   The Product Owner remains accountable for the effective application of the business requirements and strategic goals of the company into everything that is developed for the Control Management Web App. He should respond to any doubt from the sales force concerning the usage of the software tool and advocate Agile philosophy inside the company. He is responsible for the Product Backlog and needs to orchestrate the project to maximize the Development Team effort. In the end, the Product Backlog priority should, at all times, be defined previously with the Sales Manager and enforced by the Product Owner.

The following chapter will give the Product Owner perspective on the software development of a Control Management Web App by introducing two new modules - Operational Costs and Stocks. As we will see, the Product Owner is the voice of the customer and he needs to respond to the management team in terms of the strategical aspects associated with the designed requirements and further implementation of each "done" increment. This strategical role of the Product Owner in the Scrum framework is often overlooked, when in fact is one of the most important aspects of the Agile approach. In fact, the human bias is one of the biggest unforeseeable variables to handle in this type of projects because, in the end, the code that is developed is only usable while people are willing to use it. Agile is about people and the willingness to adapt and create value by enhancing the human factor.

The communication also plays an important role in the Scrum framework, specially between the Product Owner and the Scrum Master, the strategical and operational side of the project. While the Scrum Master ensures that the Scrum framework is enacted by the organization, in this case, the Product Owner ensures that the strategical framework of the company is enacted by the Scrum framework employed in the process.

4.2   Control Requirements

The requirements for the projects were initially defined from the business perspective with a description of the main strategic guidelines seen in Chapter 3. Then, using these guidelines, the scope for the Control Management Web Application is established from a MCS perspective. Using a concept introduced by Flamholtz et al. (1985), the control requirements are defined in terms of *ex ante* and *ex post* forms of control. *Ex ante* controls have a more behavioural function while *ex post* controls have a more informational function. Any change implemented in the MCS begins in *ex ante* controls but is reflected by *ex post* controls. The planning requirements were designed to align the activities with desired organizational outcomes. The budgets and logistics requirements look at two artefacts, cash and material flow, and envision and explore new solutions to respond to the planning requirements. The costs and stocks requirements are defined to guide the management team and support decision making.

As seen in Figure 4.1 the Business Requirements Diagram represents the MCS implemented in this project. This structure orientates the project and aligns the Scrum effort with the company
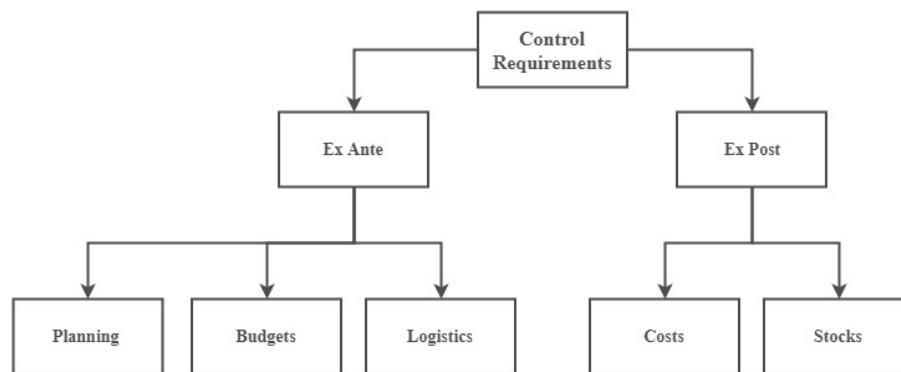
Figure 4.1: Business Requirements Diagram

strategy, broadening the task of the Product Owner to the implementation of a MCS using a Control Management Web App. In this case, the MCS implementation is not only recursive from an action planning point of view, since it suffers constant transformations to respond to the immediate needs of the business, but also from a long-range planning point of view, since it reflects the ever-changing goals of the company. Highsmith (2010a) states that teams should focus in outcomes instead of trying to follow the business requirements according to plan. This Agile principle serves as guide to this project and in this case the requirements presented were built and adapted successively as the project developed. They were dynamic and suffered constant change to adapt to inevitable changes that were faced by the business itself. In the end, what was important was to deliver business value, not useless requirements.

4.3 Ex Ante Controls

Ex ante controls are intended to prevent certain behaviours. They are executed before any action is taken and designed to compel subjects to enforce certain practices or outcomes. With a behavioural function they are based on what is expected to happen within a certain process.

4.3.1 Planning Requirements

The tactical and strategic scope of the designed planning requirements are defined in terms of action and long-range planning in Table 4.1. This establishes a link between the overall strategic goals of the company for the youth segment, seen until now, and the management software tool implemented using the Scrum framework.

The planning requirements set the pace of the project and are the cornerstones of the entire MCS structure. They direct the project towards a concise end and give a bigger picture of what is being developed within the MCS system. They are enforced in an iterative way subject to change, using the concept of MVP of adapting over conforming to a list of useless features. This allows the managers to get acquainted with the MCS while its being implemented and helps to envision new features that were not originally considered.

Table 4.1: Comparison between action and long-range planning goals

Action Planning	Long-range planning
Increase the efficiency of the operation	Gain market share
Improve and standardize processes	Customer focus
Diminish the operational load	Optimize resources
Reduce business controlling tasks	Autonomous management

Once again, the planning requirements should be aligned with all the people involved in the MCS. They should consider that the human component is an unpredictable factor that can cause uncertainty, lack of clarity and inconsistencies in the MCS. Management has the difficult task to assure that the behaviours of those enrolled in the project are consistent with the organization's objectives and strategies. Thus, before the MCS can be adapted to the planned process, it should first be adapted to the expectations, practice and values of the people involved.

Requirements are then based not on what was planned but on what was envisioned in terms of tactical and strategical scope for the project. The way the goals are reached suffers sudden mutations to the initial requirements, but the deep understating of the goals remains the same if what is designed follows the envisioned guidelines.

4.3.2 Budget Requirements

As seen in Chapter 2, cost estimation is a part of companies daily life. In the youth segment costs arise mainly from the commercial operation that drains most of the segment budget, in the onerous process of obtaining new customers. This follows the principle that every sale is a source of revenue for the company, making this budget allocation to the sales team logical and cost-effective.

Since the operation is outsourced, the budget effort mainly concerns the sub-contracted agencies budget. Awarding a contract involves the participation in a periodic contest. In a first stage, the sales team presents its objectives, goals and requirements to award the contract, then, in a second stage, the agency presents a proposal with the services to be provided along with a budget. An Excel sheet with all the costs is analysed and the Sales Manager decides the best proposals based on their offer and, in a third stage, awards the contract. The contract is only awarded for a period of time and every time there is a contest a new budget needs to be sent. On top of this expenditures the company pays a fee to these agencies.

The POS are assigned to the agencies based on geographic areas. Once assigned, is the responsibility of the agency to assure the normal functioning of that POS, according to what was agreed with the company. Everything from contracting the sales force to provide supervision to control the operation is made by the agency. Nevertheless, if the sales objectives are not met, the company has the final decision on whether or not to end the commercial operation in that POS. The opposite might also happen and if the sales objectives are being met the company can decide

to expand the operation to new POS. The company has always the final call on every strategic decision, like the number of salespeople, POS, supervision and operational structure. Apart from budgets, the only thing that once agreed is not flexible to be changed is the POS that was assigned in the contest. Once assigned the POS can only be operated by the agency that was awarded the contract.

Costs are allocated based on activity-based costing (ABC) that, as seen in Chapter 2, assigns the costs to each activity that is performed to offer a product or service to the customer. Usually, in sales management, ABC analyses costs in terms of products, territories, salespeople, and customers. For this analysis, it is considered the allocation to POS and agencies because it is a mono-product with a single price tag, that has an associated cost per salesperson that is paid to the sub-contracted agencies. The expenditures for each category are accounted several using calculation metrics.

To allocate costs based on ABC it is necessary to define, for measurement purposes, if they are direct[1] or indirect costs[2]. The object of the measurement determines how costs are allocated (Johnston and Marshall, 2016). As seen in Table 4.2 according to the object of measurement the cost categories can be directly or indirectly allocated. There is no cost directly allocated to a POS without being allocated to a Agency, because if it is allocated to a POS it is automatically allocated to the agency because only one agency operates in that POS.

Salespeople	$(cost/hour \times working\ hours + meal\ allowances) \times days\ of\ work$
Supervision	$cost/hour \times total\ working\ hours + meal\ allowance \times days\ of\ work + car\ cost + overnight\ stay\ cost$
Fleet	$cost/day \times days\ of\ work$
Stays	$cost/day \times days\ of\ work$
Rewards	$total\ rewards\ cost$
Fee	$total\ agency\ costs \times fee$
Rentals and Licenses	$cost/day \times days\ of\ work$
Gifts	$consumed\ gifts$
Installations/Disassembles	$cost/day \times days\ of\ work$
Stands	$cost/day \times days\ of\ work$
Insurances	$cost/day \times days\ of\ work$
Operation	$total\ operation\ cost$
Others	$total\ others\ cost$

ABC gives a better understanding on where the company time and money is being spent. This helps managers decide the cost and profitability of certain undertaken services. The costing approach to be used should be carefully chosen by the Sales Manager because an incorrect allocation of costs can force the decision to mistakenly abandon a certain POS. To sum up, a budget description by Agency, POS and Category is given in Table 4.3.

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[1]Cost that can be fully attributed to a certain "cost object".

[2]Costs that are difficult to be assigned to a certain "cost object".

Table 4.2: Budget allocation of direct and indirect costs

	Object of Measurement	
Cost category	Agency	POS
Salespeople	Direct	Direct
Supervision	Direct	Direct
Fleet	Direct	Direct
Stays	Direct	Direct
Rewards	Direct	Indirect
Fee	Direct	Indirect
Rentals and Licenses	Direct	Direct
Gifts	Direct	Direct
Installations/Disassembles	Direct	Direct
Stands	Direct	Direct
Insurances	Direct	Direct
Operation	Direct	Indirect
Others	Indirect	Indirect

Table 4.3: Budget description by type of cost

Type	Description
Agency	Includes the costs directly concerning the operation of the sub-contracted agencies. These costs can either be paid directly to the agency with a fee or internally without fee
POS	Includes the costs directly concerning the operation in a specific POS. The categories *operation, fee and awards* are directly allocated to the agency but not allocated to the POS.
Category	Includes the costs allocated according to the labelled categories. These costs can be either directly allocated or not to the Agencies and POS. The category *others* is not allocated to any Agency or POS

4.3.3   Logistic Requirements

To maintain the commercial operation going, an internal logistic operation is set to distribute SIM cards and promotional gifts to every POS. As seen before, a sale implies the handover of a SIM card and a premium gift, which means that the POS needs to be supplied from time to time to replenish the material. Besides the premium gift that has a purely commercial purpose, low-cost gifts can be given before the sale is closed to caught the attention of the client and to activate the brand. The phone number associated with a single SIM card is called MSISDN and through it it is possible to map and identify every card in the inventory of the POS. Aside from the identification number, the SIM cards are all alike and do not differ from each other. Even though the SIM cards are already pre-activated before the expedition is sent, the free top up campaign is only

available after the expedition is send and the card allocated to the commercial channel. Since each distribution channel has its own campaign, the offer can only be made available after the expedition is send.

The company is responsible for supplying the POS with SIM cards and promotional gifts necessary to run the operation, but it relied exclusively in the sub-contracted agency to receive the material and deliver it to the POS. To increase the efficiency of the process and diminish the operational load of the agency, the company decided to review and optimize this supply chain process. The main concern was that the supervisors were spending too much time with stock replenishments that somehow distracted them from their core function of supervising and controlling the sales force. On top of that, the role that the agencies played in the logistic operation of the sales process created a dangerous dependency in these partners. To adapt the strategical concerns of the company, the logistic supply chain was reviewed and the company devised a new logistic plan to remove the agency from its operational load. The steps concerning the old and new process are quickly recap in Figure 4.2.

(a) Old Logistic Supply Chain
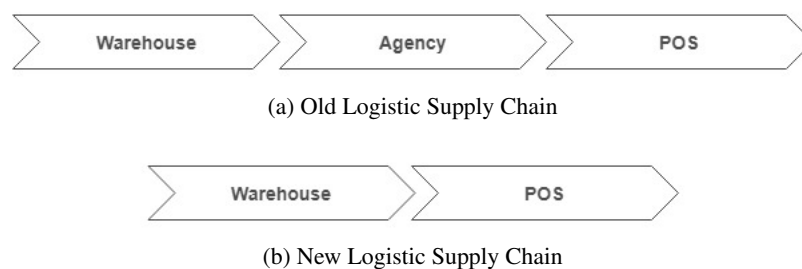

(b) New Logistic Supply Chain

Figure 4.2: Old and New Logistic Supply Chain Process

The current POS logistic supply chain can be seen in Appendix C, Figure C.1. The process begins with a forecast from the Sales Manager on the amount of SIM cards that the company needs to supply and an estimate of promotional gifts that are being consumed. When the inventories are low, the Sales Manager uses the SAP software to generate a reference, initiating the expedition process. Depending if it is an expedition of SIM cards or promotional gifts, the process follows different procedures. For an expedition of SIM cards, the Sales Manager creates a SAP reference that is sent to the company warehouse, located in Alverca, next to Lisbon. The warehouse then dispatches the ordered quantity to the agencies, that have the responsibility to distribute the material to all POS, during their daily supervision of the operation. If the expedition concerns promotional gifts the Sales Manager creates a SAP reference, sends a purchase order and the supplier can either dispatch the promotional gifts to Alverca or send them directly to the agency. The inventory of the material is made by the agency and sent to the Sales Manager on a weekly basis.

The new POS logistic supply chain that was designed reduces the intermediation of the agency in the process and dispatches the material directly to certain POS. The flowchart with the detailed process can be seen in Appendix C, Figure C.2. In this new logistic model, the warehouse dispatches directly to the shopping centre stands. If in that same shopping centre there is another POS, in this case a NOS store, the material is transferred from the shopping centre stand to the

NOS store. For the remaining POS, the process is unchanged, the agency receives the material and distributes it. With regard to promotional gifts supplier, the material can be dispatched to the warehouse, directly to the shopping centre stand or to the agency. Lastly, if the shopping centre stand is supplied directly from the warehouse the reception of the material is done by the salesperson that, if needed, will begin to arrive earlier to the POS to check if the material that was received matches the expedition details.

The choice of supplying the shopping centre stands falls in three main reasons that justify the decision: the sales volume, the proximity to other POS and the fact that the fixed stand can store the material in its drawers. Analysing the sales volume of the POS that will be supplied directly from the warehouse, from January to May 2018, these POS have represented 77% of the total commercial activity of the segment. This means that considerable quantities can be sent and stored without the need to adapt internal logistic processes. If the operation was set to supply movable POS, internal supplying processes would need to be adapted and costs would be too high. On top of that, the proximity that the shopping centre stands have to the NOS stores in the shopping centre allows that a hybrid system is set without increasing the complexity of the model. Last but not least, the fact that the stands operate on a daily basis allows that regular expeditions can be made, which on the long run stabilizes the process.

The implementation of the new logistic supply chain required the exchanged of the shopping centre stands to assure the storage of the material. On top of that, higher volumes of SIM cards and promotional gifts will have to be dispatched from Alverca to create safety stock. Finally, to receive the material, the salesperson might have to open the POS earlier that usual.

4.4   Ex Post Controls

Ex post controls are intended to help the decision making process, gauging the course of action. They are executed after an action is taken and designed to evaluate and measure certain practices or outcomes. With an informative function they have a retrospective effect over a certain process.

4.4.1   Cost Requirements

To justify the money that is invested, the Sales Manager should keep a close control of the costs incurred by the commercial operation. Due to the flexibility of the business activity, budgets suffer significant deviations from the norm. Before the implementation of the new improvements in the Control Management Web Application the costs were analysed using an extensive Excel file called "Master Budget" which gathered information from several spreadsheets to compile the information, encompassing it by month. This Excel file was updated based on all the payments that were made from the sales management team.

The implemented MCS had several inefficiencies in terms of cost accounting. The profitability of the POS was not analysed in real-time and monitoring the actual expenditures versus the planned budget was only done when the company had to pay the invoice to the agency, when the period awarded in the contest ended. Once again, the MCS required more flexibility to adapt to the

changing nature of the business and three main requirements were considered to improve the way information was measured to help management evaluate the performance of the commercial operation in terms of cost analysis:

Visualization and Report   Using images to represent data is a powerful tool to transmit information in a way that can be easily understood. MCS are all about enforcing and adapting behaviours and clearly communicating the company strategy, their objectives and the ways they can be achieved. Through visualization the Sales Manager can have a visual short-cut to have the essence of the information, because most of time he does not have time to carry out an intricate analysis on the data. The data should be filtered by agency and date to allow comparisons between different periods of time. According to the type of information to be analysed the usage of some charts might be more appropriate than others. In this case three types of charts were considered: bar charts, line charts and pie charts. On top of the visualization tools, in a timely and convenient manner, the system should compile all the information into a report to be used by the Sales Manager, whenever he needs more information regarding a certain topic.

Performance Metrics   Choosing the correct measures to serve as guides to the MCS is a fundamental step in the process of its implementation. The main metric used should be the analysis by cost per client, resulting from the division of operational costs and sales volume. This metric allows to understand how much it costed to acquire a customer and it is used by top manager to calculate the Customer Lifetime Value (CLV) of the youth segment. The performance can be evaluated based on the performance value of the homologous period considered and on the investment that the administration is willing to make to acquire a new customer.

Information Quality   Safeguarding the integrity of the information is fundamental to allow that whatever MCS tool developed, it can be used by management to effectively control the operation. The best way to assure this is to integrate the information in a database and compile the data using a computer-based system that minimizes human-error. This way the metrics should be calculated and displayed using the same algorithm all the time, creating a common ground that the organization could use to evaluate business costs without data processing bias.

These three requirements can be encompassed in the concept of dashboard, a panel with the performance of the operation linked to a database where the main business details are stored. The information is thus constantly updated with real-time information. The dashboard supports the business and allows the manager to take immediate corrective action with simple, clear and straightforward data. In terms of MCS, this approach simplifies the budget control and gives concrete information to carry out a profitability analysis to back up the decision-making process of the Sales Manager regarding strategical matters.

4.4.2   Stock Requirements

To implement an effective logistic supply chain the flow of information should be in the heart of process. Keeping track on how the business operation is performing is an important component to consider when designing a MCS system. The fact that the commercial operation concerns moving goods creates the need to develop mechanisms to calculate how much stock is being consumed. While for premium gifts an estimate of consumption can be made using the volume of sales, in the low-cost gifts the only information that exists concerns the quantities dispatched to the agencies.

   With the new planned logistic model, the company needs to ensure minimum stock quantities and order fulfilment whenever necessary. Out of stock is not an option and for each POS a stock balance needs to be held regularly so that the operation runs smoothly without complications. In this case there are no holding costs and each replenishment is assumed to have zero costs for the operation, since the cost of transportation dilutes in the overall logistic operation of the company. The ordering process will follow the periodic review model, where orders are placed at regular intervals with varying amounts, according to the target stock level. As seen in Chapter 2, this model suits high, regular demand of items with low value and the order quantity can be defined as:

$$order\ quantity = mean\ demand \times (T+L) + safety\ stock - stock\ on\ hand$$

$$where\ T+L\ represents\ the\ order\ interval\ plus\ the\ lead\ time$$

(4.1)

The Sales Manager should follow this model to control the stock, nevertheless this formula only works as a guideline since the company is not incurring holding costs with this operation. If the Sales Manager seems fit to dispatch larger amounts of SIM cards or promotional gifts there is no operational problem with it. The only thing that should be assured is that the POS are never left out of stock. To help the Sales Manager handle this, four MCS requirements were considered:

Material Allocation   The system should be able to integrate the SAP reports, detailing the expedition references of SIM cards. Since the dispatches of promotional gifts involve a third-party (the gift supplier) they can be introduced by the Sales Manager directly once the material is sent to a POS.

Transactions Record   The inventory will be discounted based on the sales. If a sale occurs, a premium gift and a SIM card is immediately discounted, while for the low-cost gifts the Sales Manager defines a ratio of consumption. This ratio will be adjusted over time when more information regarding the consumption of low-cost gifts is gathered. All the discounted material and dispatches entries should be reported in a list of transactions, to keep a historic track of the moving goods. This list can then be consulted to track the material.

Inventory Management   To manage stocks efficiently the inventory levels of each POS should be reported in a clear and concise way. The display with the stock inventory should have the

quantities that were dispatched to each place and the quantities received by the salesperson, since he needs to check if the material received is according to what was dispatched. On top of this, the Sales Manager and the supervisors should be able to transfer stock from one place to another and, once the inventory is verified, to insert shortages in the stock whenever necessary to adjust what was accounted to what was really discounted.

Reorder Alert   The system should create alerts to notify the Sales Manager when the dispatch day arrives, informing that it is time to reorder material to a certain POS. The system should use the periodic review model to calculate the order quantity. On a later phase the system itself should be able to make purchases and replenish products automatically.

Last but not least, the transaction of stock will need to be associated with the cost accounting. For the SIM it is assumed that the company does not incur in any cost with their production, since their cost is not considered in the budget for the youth segment. For the promotional gifts, since they are bought by the sales team to external suppliers, its cost should be considered and accounted. The accounting of premium and low-cost gifts follows different approaches, namely the First-In, First-Out (FIFO) method and the weighted average method, respectively.

To sum up, the new form of accounting gives management a bigger control over the commercial activity. The requirement developed to manage stocks will influence the cost accounting made by the Control Management Web App. In the following section it will be demonstrated the key features to be implemented.

4.5   Key features

Before the implementation of this solution, key features were defined to serve as functional guidelines to the project. There will be some differences between the solutions implemented and the key features defined, since following the Agile working methodology requires that the software developed must be adapted to the business realities. These key features were though as the best solutions found to create the improvements in the MCS to align the project with the planning requirements. Nevertheless, since they are iteratively implemented, they are always subject to gradual adaptation.

4.5.1   Costs

For each contest a new budget needs to be created. The budgetary period corresponds to the awarded period of operation and is the same for all agencies. When a contest ends and the operation is awarded to an agency, the correspondent budgetary period is introduced in the Control Management Web App. After selecting this budgetary period, the agency introduces the budget for approval, filling all the different categories of costs. These categories include salespeople, supervision, fleet, stays, rental licenses, installations/disassembles, stands, insurances and additional

budget reinforcements[3]. Upon submission, the Sales Manager receives a notification and the budget is locked. The values are analysed and they can be validated, if a consensus is achieved, or further negotiated with the agency. To allow additional changes the manager needs to unlock the budget for editing and the agency makes the necessary alterations and submits the budget again. This process is repeated until the budget is finally approved by management. Before the final approval the Sales Manager should introduce a fee. Finally, any reward given to the agency should only be included after the budgetary period comes to an end.

Internal costs should also be included in the budgetary period to have the full cost accounting of the operation. Internal costs include uniforms[3], moving stands[3], flyers[3], material delivers[3], others, gifts, rental licenses, installations/disassembles, stands and insurances. They can either be allocated to an agency, in the case of the operation costs, or to a POS in the case of rental licenses, installations/disassembles, stands and insurances.

After approval, the different costs need to be accounted according to the information retrieved during the daily operation. To be able to have a real-time analysis the budgeting should be crossed with other information that the Control Management Web App retrieves from the users of the App Dealer and Back Office. To allocate costs based on activity-based costing (ABC), as defined in the MCS requirements, the calculating metrics should be devised from the Control Management Web App perspective. Before any software implementation, an analysis was made to understand how the cost were supposed to be accounted in each category. Once again this was not a linear process of analysis and implementation, during the implementation and testing stages several problems and questions changed the analysis and set new features to be implemented.

Salespeople   This category corresponds to the wages paid to the salespeople. The *cost/hour*, *meal allowance*, *working hours* should be allocated to a Type of POS or POS. The *days of work* should be accounted based on the check-ins that were made by the salespeople through the App Dealer in that same POS. Some exceptions need to be covered, to include the cases where for a certain POS it exists a sales coordinator with a different wage, or a salesperson with different working hours. Budget adjustments can be made to a particular POS or to the category itself.

All the salespeople costs should be directly allocated to a POS and Agency with the exception of the adjustments made to the category. If this happens, to be allocated to the POS, the cost should be distributed according to the relative frequency of the confirmed sales.

Supervision   This category corresponds to the wages paid to the supervisors and includes the cost of their cars and the necessary overnight stays. Since the supervisors do not have a regular schedule the *total working hours* should be accounted based on the supervision report, that details the duration of each supervision visit and the POS where it was made. Based on this information, introduced by the supervisor, the system should calculate the total amount of hours worked and allocate them to a POS.

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[3]Operational Costs.

The *car cost* should be calculated based on the *cost per km* plus the *rental cost* multiplied by the *days of work* indicated in the budget. The *overnight stay cost* should be allocated to a Type of POS or POS and calculated based on the *cost/day* multiplied by the *number of nights* indicated in the budget. The distribution of the *car cost* by POS should be made using the working hours previously allocated using the supervision report.

Fleet   This category corresponds to the cars used by the salesperson to move to a certain POS, usually to carry movable stands in POS like Universities or Events. The *cost/day* should be allocated to a Type of POS or POS. The *days of work* should be accounted based on the check-ins. The car cost can be accounted using its total value, but in this case the user should insert the number of days and the system calculates automatically the cost per day. This way the costs can be allocated daily.

Stays   Every time that there is a need to pay overnight stays to the salespeople, which is a common thing during the summer period in Alentejo and Algarve, the *cost/day* and *days of work* are allocated the same way that was described in the paragraph concerning the fleet.

Rewards   The reward is given by the management team if the objectives set are met. Due to the nature of this category this cost is only allocated to the agencies. The *total rewards cost* should include rewards given to the agency, to the supervisors or the salesperson.

Fee   The fee is a percentage defined by the Sales Manager that is calculated over the costs of the agency. The *total agency costs* include the salespeople and supervisors wage, the flee and stays, rentals and licenses paid by the agency and additional reinforcements costs incurred by them. This cost is not allocated to any POS.

Rental and Licenses   Rentals and licenses can be a cost supported either by the agency or the company. This cost includes the rent of the shopping centre stand, the license to set the operation on the street, the license to be present in a major event and so on. The *cost/day* and *days of work* are allocated the same way that was described in the paragraph concerning the fleet.

Gifts   The accounting of promotional gifts will be done when the stocks module is implemented. Since its allocation is directly related to this new feature in the Control Management Web App, its explanation is described in subsection 4.5.2.

Installations/Disassembles, Stands, Insurances   These three categories represent costs directly related with the operation of the POS. Installations and disassembles consider the cost paid to remove or place stands or other type or structure in the POS. Stands consider the cost paid to repair or produce new stands that are fixed in a POS. The insurance is a provision that needs to be paid to operate in the shopping centre stands. The *cost/day* and *days of work* are allocated the same way that was described in the paragraph concerning the fleet.

Operation   The operation includes operational costs that are attributed to an agency, but cannot be allocated to a POS. The *total operation cost* should include budgetary additional reinforcements, uniforms, moving stands, flyers and material delivers.

Others   Costs that do not fit in any of the categories analysed above are categorized as other. Due to the lack of characterization this cost is not allocated to any agency or POS.

Last but not least, in the budget introduced by the agencies, it should be possible to add adjustments if the costs accounted do not correspond to what was paid. Adjustments can be made over a category, but they are not a category themselves.

Finally, when all the costs are accounted, the Control Management Web App should create a dashboard with all the information compiled according to the allocation rules that were defined above. The dashboard compiles the information to give quick access to the information filtering it by agency and period of time. InfoBoxes, graphs and a downloadable Excel file is used to display the results; the first summarizes the information in a concise way, the second is used to visually communicate the information, while the third offers a more quantitative analysis, with the information structured in tables.

4.5.2   Stocks

To implement the new logistic supply chain in the commercial operation, new stock control features had to be integrated in the Control Management Web App. Digitally managing stocks helps to organize the different stages of a process in a structured and standardized way that requires less effort and wastes less time. To develop a platform that could effectively manage stocks two distinct features should be developed. The reception of the material should be done through the App Dealer and the inventory control through the Back Office. On top of all that, the gift consumption should be interconnected to the costs accounting to quantify, in each budgetary period, the expenditures of this category.

Once again, to have real-time metrics, the stock should be accounted based on the sales performed in the daily operation. The features defined consider information retrieved during tests made in two POS, nevertheless, as new information is gather about the concrete implementation of the project, new features might arise. The testing stage creates uncertainty about the solutions found to implement the project in a MCS perspective. The main idea is that the presented features can serve as an initial launching pad and then evolve incrementally over time.

Dispatch   As seen before, according to the material that is sent to the POS, the integration in the Control Management Web App of the dispatched quantities follows different procedures, as seen in table 4.4.

Table 4.4: Integration procedures upon material dispatch

Material	Procedure
Premium Gifts	The Sales Managers inserts the expedition number, the quantity and the POS.
Low-Cost Gifts	The Sales Managers inserts the expedition number, the quantity, the consumption ratio and the POS.
SIM Cards	The SAP report with information concerning the dispatched SIM cards is automatically integrated in the system.

Reception   When the material is dispatched directly to the shopping centre stands, the reception of the material should be made by the salesperson in the POS through the App Dealer. In this process its assumed that the warehouse dispatches the right quantities of stock, according to what is described in the SAP report. This assumption is made based on past experiences with NOS stores where similar logistic supply chains were implemented.

The salesperson should be able to check-in into the App Dealer and select an option specially created to communicate the reception of stocks. The App Dealer should display the dispatch number, the type of material and its quantity for approval. If the information in the App Dealer is according to the information in the dispatch box, the salesperson can approve the reception of stocks. For the SIM cards, when the information regarding the dispatch is not integrated in the Control Management Web App, the App Dealer should allow the introduction of the dispatch number and the quantity received.

After the salesperson approval, the stock is inserted in the inventory. In the cases where the salesperson inserts the dispatch number and the amount of SIM cards received, the information is cross validated when the SAP report is integrated. In the eventuality of a non-conforming dispatch, the Sales Manager inquires the supervisors and after finding what happened, it should be possible to adjust and insert the stock, from the Back Office, according to what was actually dispatched. What is send to the agencies should be automatically approved by the Control Management Web App.

Inventory Control   To keep track on the inventory level a table should be created with the amount of stock available in each POS. The stock is discounted according to what was discussed in subsection 4.4.2 and the inventory level should be automatically updated every time a new sale is made. It should be possible to filter the fields in the table by agency, type of POS and, within the type of POS, select a specific POS location. The inventory level in the POS can be edited to allow stocks transfers and the introduction of shortages by the Sales Managers and the supervisors. Once the order period is established, the system should automatically send an email to the Sales Manager with an advise on the quantity to order of each type of material, according to the metric refereed in subsection 4.4.2. Every time a transaction of material is performed, that information should be recorded. If the stock is received, the transactional movement is positive; if the stock is

discounted or has shortages the transactional movement is negative; if the material is moved from *A* to *B*, transactional movement in *A* is negative and positive in *B*.

Gifts Accounting   While the SIM cards do not have any cost associated, the promotional gifts have costs that should be accounted using the Control Management Web App. To do this, it is necessary to define, within budgetary periods, the costs of the consumed gifts and the value that is transiting to another budgetary period, according to what was purchased. The purchased gifts are supplied to a POS and, once allocated, they are discounted and the consumed gifts are accounted using the FIFO method for the premium gifts and the weighted average method for the low-cost gifts. Shortages can adjust the consumption to the real inventory held. In the end, the transiting stock corresponds to the value that should be allocated to the next budgetary period. The *consumed gifts* then correspond to the purchased gifts minus shortages minus the transiting stock to the next budgetary period. This process is illustrated in Figure 4.3.
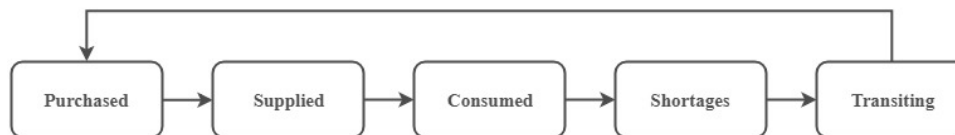
Figure 4.3: Different Stages in Gift Accounting

The purchased and transiting gifts should appear in the costs module since they are intricately related to the allocation of costs for this category. With the introduction of this feature management should be able to understand the expenditures based in the accounting of consumed gifts minus the shortages for the budgetary period considered.

Chapter 5

Modules Implementation

The implementation of the MCS requirements was done through the Control Management Web App using the Scrum framework as a guide to the process. In this chapter the Product Backlog used in the project is explained followed by a description of the implemented features in terms of costs and stock. Finally, core functionalities are presented to describe the practical usage of the tool by the commercial department in the youth segment. Through this chapter, the spectrum of what needs to be done in the future is given, in order to fully implement the Control Management Web App as a central platform which centralizes information.

5.1   Product Backlog

The features developed were implemented, tested and evaluated along with the business requirements. Based on the Agile philosophy, the features described evolved according to the expectations of the management team, following the MVP logic of developing a minimum amount of core functions, in an incremental way, providing early feedback on the product. To do this, a Product Backlog was built, steadily adjusted to the business requirements. This list of features to be included in the Management Control Web App was discussed in weekly Sprint planning meetings with the Scrum Master before the Development Team started the Sprint to deliver another increment.

As seen in Figure 5.1, the Product Backlog had a list of requirements and each requirement had a list of backlog items to be developed within a predefined time frame. In this illustrative case, the list encompassed the backlog items of the stock requirements. The items had colours according to the status of the implementation. The red lines were to do implementations, the green lines meant that the requirements were in the Sprint phase, the yellow lines indicated that the process was in a testing stage, and finally, the grey lines represented "done" increments. The priority of each backlog item was classified from 1 to 5, being 5 the backlog item with the highest priority and 1 the one with the lowest. A schedule, previously defined between the management team and the Scrum Master, was also added with the timetables for each Sprint.
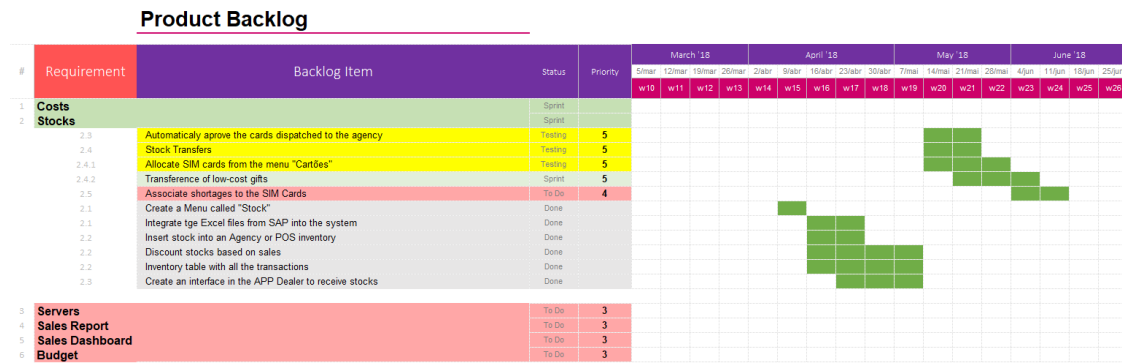
Product Backlog

#	Requirement	Backlog Item	Status	Priority	March '18				April '18					May '18				June '18			
					5/mar	12/mar	19/mar	26/mar	2/abr	9/abr	16/abr	23/abr	30/abr	7/mai	14/mai	21/mai	28/mai	4/jun	11/jun	18/jun	25/jun
					w10	w11	w12	w13	w14	w15	w16	w17	w18	w19	w20	w21	w22	w23	w24	w25	w26
1	**Costs**		Sprint																		
2	**Stocks**		Sprint																		
	2.3	Automatically aprove the cards dispatched to the agency	Testing	5											■						
	2.4	Stock Transfers	Testing	5												■					
	2.4.1	Allocate SIM cards from the menu "Cartões"	Testing	5												■					
	2.4.2	Transference of low-cost gifts	Sprint	5													■				
	2.5	Associate shortages to the SIM Cards	To Do	4														■			
	2.1	Create a Menu called "Stock"	Done						■												
	2.1	Integrate tge Excel files from SAP into the system	Done							■											
	2.2	Insert stock into an Agency or POS inventory	Done							■											
	2.2	Discount stocks based on sales	Done								■										
	2.2	Inventory table with all the transactions	Done								■										
	2.3	Create an interface in the APP Dealer to receive stocks	Done								■										
3	**Servers**		To Do	3																	
4	**Sales Report**		To Do	3																	
5	**Sales Dashboard**		To Do	3																	
6	**Budget**		To Do	3																	

Figure 5.1: Product Backlog Implemented in the Project

The Product Backlog is not static and is subject to change according to the reality of what is being developed. Every week, the Product Backlog was reviewed and adapted to the status of the project. The list of features to be developed and the predefined time frame was always dependent on the amount of workload that the development team has at hands. Sometimes Sprints had to be postponed or even cancelled if other needs suddenly arose. For example, if the marketing team launched a new campaign that required the development of new features in the WTF website, the development team would be busier and the development of the Control Management Web App would be delayed. When this happened, the Product Backlog was analysed and adjusted to the new status.

5.2 Costs

Budgeting was the first key feature to be implemented. As seen in Figure 5.2, the Control Management Web App allows the creation of budgetary periods for the specific time frame awarded in the contest. If their status is active, they can be edited by the agencies; when inactive it means that the budget is locked for editing. To implement this project in the existing Control Management Web App, a new type of user had to be created for the agency managers, since the supervisor did not have the permission to access costs. This way the user *agency admin* was conceived to give new clearance levels to access costs, as seen in Appendix B, Table B.1. The user *admin* can create, edit and remove budgetary periods, while the user *agency admin* can only edit budgetary periods when active.

The user *agency admin* can select a budgetary period for editing and then fill the different cost categories according to the budget that was sent. An estimate of the total cost for the budgetary period is made based on the values introduced. When the budget is submitted to approval, the user *admin* receives a notification in the email and the user *agency admin* cannot make any more alterations. The user *admin* looks at the budgets and either approves it, placing a fee, or unblocks the budget so that the user *agency admin* can do further editing. From this point on, notifications will pop up when something is edited by the agency. In the end of each budgetary period the user *admin* can introduce a reward in the agency budget. Internal costs are only visible from the user

Figure 5.2: Control Management Web App - Budgetary Periods

User *admin* perspective.

admin perspective and their filling is independent from the agency budgets. An overview of the interface from user *admin* and user *agency admin* is given in Figure 5.3.

Once budgets receives the Sales Manager approval, they start to be accounted according to the budget requirements defined in Chapter 4. The costs are then displayed in a dashboard, only accessed by the user *admin*, that compiles all the information. The implemented solution, seen in Figure 5.5, has three main features described below.

InfoBoxes   InfoBoxes with icons are used to display the numerical sales volume, total cost and cost per client, for the selected period. This simple interface helps to summarize the most important information regarding the dashboard.

Graphs   As seen in Figure 5.5, the dashboard contains the following graphs numbered from 1 to 5, according to the description:

1. Bar graph with the volume of sales divided by budgetary period, with the confirmed sales in that period, the forecast sales and the confirmed sales in the homologous period of the previous year.

2. Mixed Graph divided by budgetary period, with a bar graph containing the total costs in that period, the cost of the homologous period and a line containing the cost per client.

3. Three bar graph with a relative frequency of agencies, type of POS and districts sales volume for the selected period and the homologous.

4. Mixed Graph, with a bar graph containing the total agencies and type of POS costs for the selected period and the homologous and a line containing the cost per client.

5. Pie chart with the relative frequency of each category.

Excel File   The information in the dashboard can be extracted to an Excel file. The spreadsheet, as seen in Figure 5.4, contains the costs, the sales volume and the cost per client enumerated by

(a) User *agency admin* perspective

(b) User *admin* perspective

Figure 5.3: Control Management Web App - Budgets

agency and type of POS, according to the budgetary period. The categories are displayed individually with their total cost. In the end of the spreadsheet, the adjustments that were introduced appear described by category. The Excel file was chosen to compile the data because the management team was familiarized with this Office software. Excel was already used in other parts of the Control Management Web App with good results and its employment in this case was a logical step.

Figure 5.4: Downloadable Excel file with Operational Costs

Some information was concealed for confidentiality purposes.

To have a comparative scenario to what was happening in terms of costs for each budgetary period, the operational costs for 2017 had to be inserted in the Control Management Web App. Their allocation probed to be difficult since they were only accounted by agency and their division by category and type of POS required an extensive analysis and the crossover of dispersed information.

Figure 5.5: Control Management Web App - Costs Dashboard

Some information was concealed for confidentiality purposes.

The agencies are already introducing budgets through the Control Management Web App since the budgetary period of March to April[1]. During this stage the dashboard was not developed yet and the budget categories suffered several changes since then. To expound the functionalities introduced in the Control Management Web App, several meetings were held with the agencies to explain the process. From the practical implementation of the project, features that were not initial considered were introduced, and others that were implemented were later disregarded. When the dashboard was complete, the allocation of costs proved to be a nightmare, due to the accounting

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[1]The budgetary period of January and February was introduced by the Product Owner based on the budgets sent in Excel sheets.

that was made using the sales force check-ins and the working hours from the supervision report. The values that the company was paying to the agency were not matching the cost that were being accounted and, from here, several changes to other features in the Control Management Web App were considered. The possibility to edit check-ins and the redefinition of the supervision routing to suit the accountability of cost are item backlogs to be developed in future Sprints. Other changes like allowing the salesperson to consult the sales ranking without triggering a check-in in the App Dealer, were already implemented. The Product Owner had the important role of managing the ever-changing need to adapt the Control Management Web App to the needs of the commercial team.

The module of costs is not fully implemented and several adjustments still need to be made to use the Control Management Web App exclusively as a MCS tool to control budgets and costs. The allocation of costs is still being revised and the features described in Chapter 4 are not fully functional. The dashboard still has several improvements to be made and the Excel sheet should detail, in the future, not only the type of POS, but the POS itself. Nevertheless, the evolution is notorious from what the company had in terms of MCS and the possibilities that it has now. Looking at the project from an Agile perspective, the company is facing with a MVP that evolved over time to this point, instead of having lots of requirements with several features being developed without practical application in the business.

5.3   Stocks

The new logistic process only began its implementation after conducting an initial testing phase for the operational costs in the Control Management Web App. As seen in Figure 5.6, the stock is allocated to each POS and the stock approved and not approved is displayed in an inventory table. The allocation of promotional gifts is yet to be implemented and the Control Management application is allocating promotional gifts without distinguishing between low-costs and premium. Since this functionality is essential to account the expenditures of this category in the costs module, a temporary Δ gifts was introduced to adjust the real consumption to what is accounted. To this day, the Control Management Web App accounts a premium gift and a low-cost gift for each sale that is made. In the end of the budgetary period, the Sales Manager makes an inventory of the stock, calculates what was consumed and introduces a Δ gifts. Once again, this is a temporary solution and when the stocks module is fully implemented, the gift account should be made according to what was defined in subsection 4.5.2.

The transaction of stock is being recorded as illustrated in Figure 5.7. Every time a SIM card is sold the systems discounts the corresponding SIM card according to the MSISDN, the identifier of the mobile phone numbers and gifts are being discounted once a sale is concluded, such as the SIM Cards. Nevertheless, once the project is fully implemented, the premium gifts will be discounted based on sales and the low-cost gifts based on a predefined consumption ratio.

Figure 5.6: Control Management Web App - Stocks

Some information was concealed for confidentiality purposes.

Figure 5.7: Control Management Web App - Stocks Transactional Record

Some information was concealed for confidentiality purposes.

Two POS, one in Lisbon and another in Porto, have already received stock through this new logistic supply chain process and one of them is already operating using SIM cards dispatched exclusively through this process. In these tests, it was discovered that the hours when the salesperson receives the material will vary from shopping centre to shopping centre according to their internal logistic processes. In the future, these routines will need to be studied and the material reception will then be adjusted to these timetables. The transference of SIM cards was also tested and new Sprints were initiated to implement separate dispatches of premium and low-cost gifts according to the features previously defined.

The user *admin* has full access to all functionalities in this module, while the user *agency admin* and user *supervisor* only have access to the stock allocated to their own agency. The

transference of stock is already implemented, as seen in Figure 5.8, but it is in a testing stage. Through it the users will be able to allocate the gifts to the different POS and implement the necessary stock transition from shopping centre stands to NOS stores as described in the last stage of the new logistic supply chain process defined in Appendix C, Figure C.2.

Figure 5.8: Control Management Web App - Stock Transfer

Some information was concealed for confidentiality purposes.

This project is still in a very embryonic stage and its implementation is yet to reveal new insights on how it will evolve over time. Compared to what was developed in terms of costs, the implementation of this module is somehow short because the project required the replacement of stands, the redefinition of the internal logistic process and the creation of new SAP references for the different POS. All these conditioning factors, allied with several issues, seen before, related to the implementation of the costs, postponed the initial sprints for the development of this module. Nevertheless, the project is ongoing and once this initial testing phase is over, the management team will have to meet with the agencies and explain the new process very carefully and with extreme care. Their active involvement is fundamental to the success of the future implementation of the process in the operation to correctly record the stock transactions.

5.4 Core Functionalities

The new modules of the Control Management Web App allows the company to, on the one hand, understand how much is costing the operation and, on the other hand, manage the stock inventory in real-time. The effects are still tenuous but several practical usages for the Control Management Web App emerged during the implementation of the project. These two modules are means to minimize the business controlling tasks by digital automation of processes.

In the end of January, to reduce the dependence to sub-contracted agencies that had been working with the company for several years, a new agency was awarded a geographic area to operate for the budgetary period of February. The introduction of this new agency in the beginning of February meant that no previous cost structure information was known about their operation and that the Sales Manager had to rapidly assess how much the commercial activity in the different POS was costing to make decision on whether or not continue with the operation in these locations.

Across the budgetary periods from March and April to May and June, the introduction of the new costs module allowed the Sales Manager to look at the cost per client of this agency to make better decisions. The costs dashboard and the downloadable Excel reports gave a more effective and powerful overview, in terms of unprofitable POS that were operating. Some POS were assigned and withdrawn based not only in the sales volume, but also considering the new information introduced by the management tool. In terms of categories expenditures, the Sales Manager, using the Control Management Web App, came to the conclusion that the supervision value had to be adjusted. Finally, an agreement with this new agency was made to reduce the value of this category in the costs structure.

The improvements concerning the stock control will also increase the efficiency of the operation. The inventory table displays the stock of each POS in real time, providing a new control over SIM cards and gifts that did not exist before. The implementation of this new logistic supply chain process standardizes the operation and, in the future, the dispatches can even be made through the periodic review model and integrated in the internal logistics of NOS, bringing together the operation of the youth segment with the wholesale segments. From the initial testing phase of this project no practical conclusion was taken in terms of functional usage of the tool since only one POS was operating under the new supply chain process. Nevertheless, when the project is fully implemented, the Sales Manager is expecting to detect and solve operational inefficiencies using the information retrieved from the inventory table.

Chapter 6

Conclusions and Future Work

Measuring success in Agile processes is tricky. Due to a lack of formal milestones and requirements, evaluating the performance of an Agile implementation can be a difficult task. Nevertheless, the evaluation must be made from a business point of view and concerning the strategical goals in terms of action and long-rage planning. The purpose was never to end the project with all the requirements and features implemented, but to measure how adequate it was to the initial goal. Agility is about envisioning and exploring the process and its main advantage is that it serves as a guide on how to adapt behaviours to reinforce certain practices. The main benefits of the methodology adopted were its simplicity and straightforwardness adapted to human nature. With this dissertation it is expected that the next Product Owner to take over this project, will read it and understand the core implications and solutions that the Control Management Web App offers to the youth segment. In the end, and once again, Agile is about people and their readiness to cope with change, nothing more.

The requirements and features were presented from an MCS point of view, while the implementation was presented using the Scrum framework as guide. Agile was the philosophy that cemented the entire project combining strategy with the tools needed to achieve its goal. The effects of the implemented features are still tenuous, but some bullwhip effects can already be seen. The module of costs in the Control Management Web App gave some insights over the performance of the agencies. The introduction of a new agency in the beginning of February required a close attention and care from the Sales Manager. The costs dashboard, even if operating in an embryonic stage, allowed to track the performance of the agency in terms of budgeting and cost category. By looking at the data, the sales management team came to the conclusion that what was being paid to the supervision did not suit the needs of the company for this particular category. In the end, the contract was reviewed and in the new budgetary period the amount paid to supervision was reduced. On top of all that, the Sales Manager was relieved from the burden of allocating and accounting costs by cross checking information, stored in several dispersed documents.

With the implementation of the new logistic process, the management hopes to save 30% of supervision time. The new inventory costing will allow to understand how much is being consumed and how this consumption is reflected by POS. The control of the SIM cards will probably

unveil certain issues related to the way agencies oversee the operation and when fully implemented the system will have the autonomy to be integrated and managed by the logistic department of the company. Even though only a few tests were made, up to the moment this dissertation was written, the results indicate that the process is feasible and that it can be fully implemented in a reasonable amount of time.

Costs and stocks are not fully implemented as they were designed in the MCS. Still, from the Agile Triangle perspective, the project created value from the usage of the releasable products to this point. In terms of quality the product has evolved and adapted and even if its reliability is still low, the management team is already acquainted with its usage and understands the core features that need to be developed. The main constrain proved to be the large scope of the project for the limited schedule of this dissertation project. In the end it is expected that this new control tool will also force agencies to be more disciplined and efficient in their operation to cope with the company strategy. The sales force will not notice much difference, since all this implementation concerns back office activities. But, in a long-range perspective, it is expected that their behaviour starts to be affected by these implementations, when operational excellency conditions them to perform better sales.

The control of payments in the POS is the next module to be introduced, once costs and stocks are fully implemented. With this management tool the commercial team hopes to centralize all the operation in this platform and, from here, construct a robust information centre that gives new insights over the business. Additional performance metrics will have to be created to evaluate the commercial operation. The new modules introduced open the door to calculate the Customer Lifetime Value, an essential metric for top-management. This information can then be used to further strengthen the decision-making process. When the internal information concerning Churn and RGU is cross with the databases of the Control Management Web App, containing stocks and operational costs, the profitability of the operation by Agency, POS and even by salesperson will be available. Once all these features are introduced, data mining techniques can be used to integrate all the information, creating reports, data analysis, giving insights that could influence and impact the business in unforeseen ways. In the future, due to its increasing size the Control Management Web App might need to be separated and divided into several independent Web Apps, each one focused in a specific module that responds to the business necessities.

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Appendix A

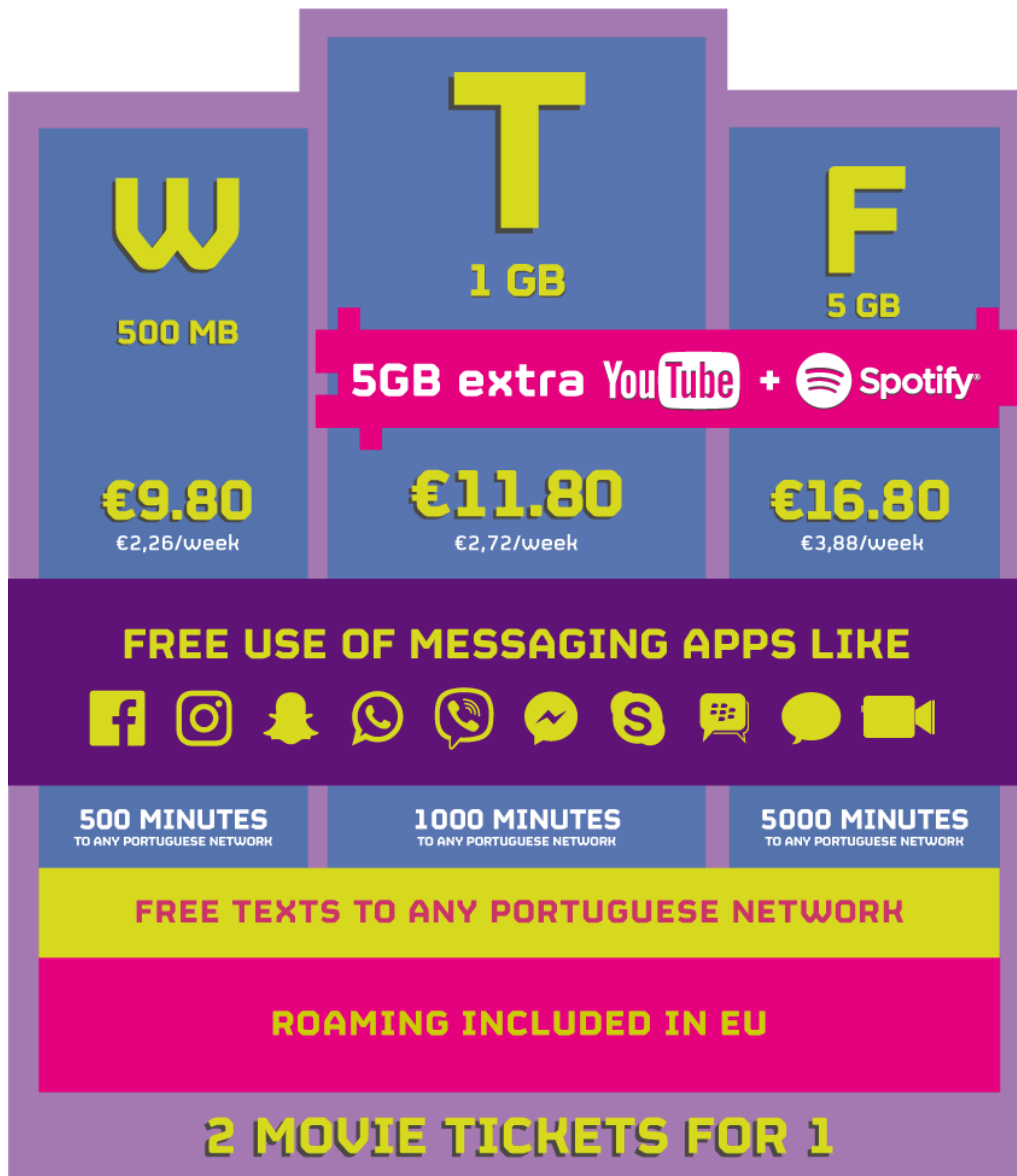# Company and Business Details

Figure A.1: NOS Group

Figure A.2: WTF Price Plans

Figure A.3: Demographic Dispersion of the WTF Commercial Operation in 2017, % of Sales

Figure A.4: Illustrative Figures of POS in Shopping Centers, NOS Stores, Streets and Events

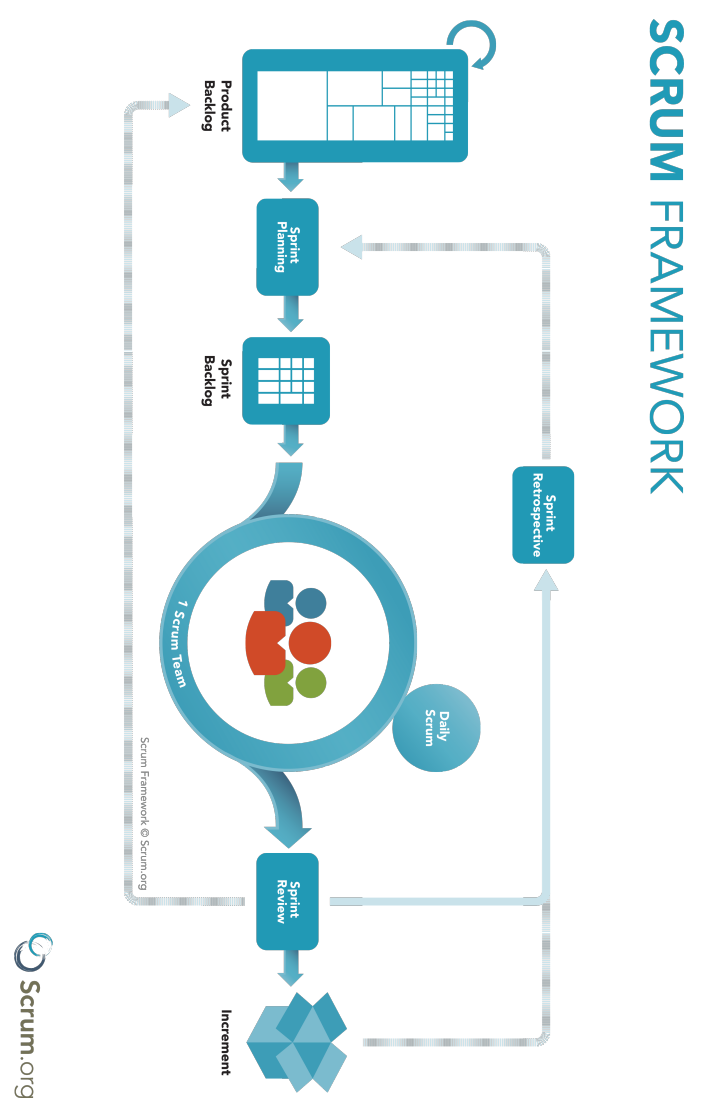# Appendix B

Management Control Web Application

Figure B.1: Scrum Framework

Table B.1: Clarence Levels in the Back Office of the Control Management Web App

Features	User *Admin*	User *Agency Admin*	User *Supervisor*
Dashboard	✓	✓	✓
Check-ins	✓	✓	✓
Routing (WTF Team)	✓		
Routing (Agency)	✓	✓	✓
Ranking	✓	✓	✓
Sales Report	✓	✓	✓
Sales Summary	✓		
Budgets[a]	✓	✓	✓
Costs Dashboard	✓		
Stocks	✓	✓	✓

[a]Internal costs are only accessed by User *Admin*
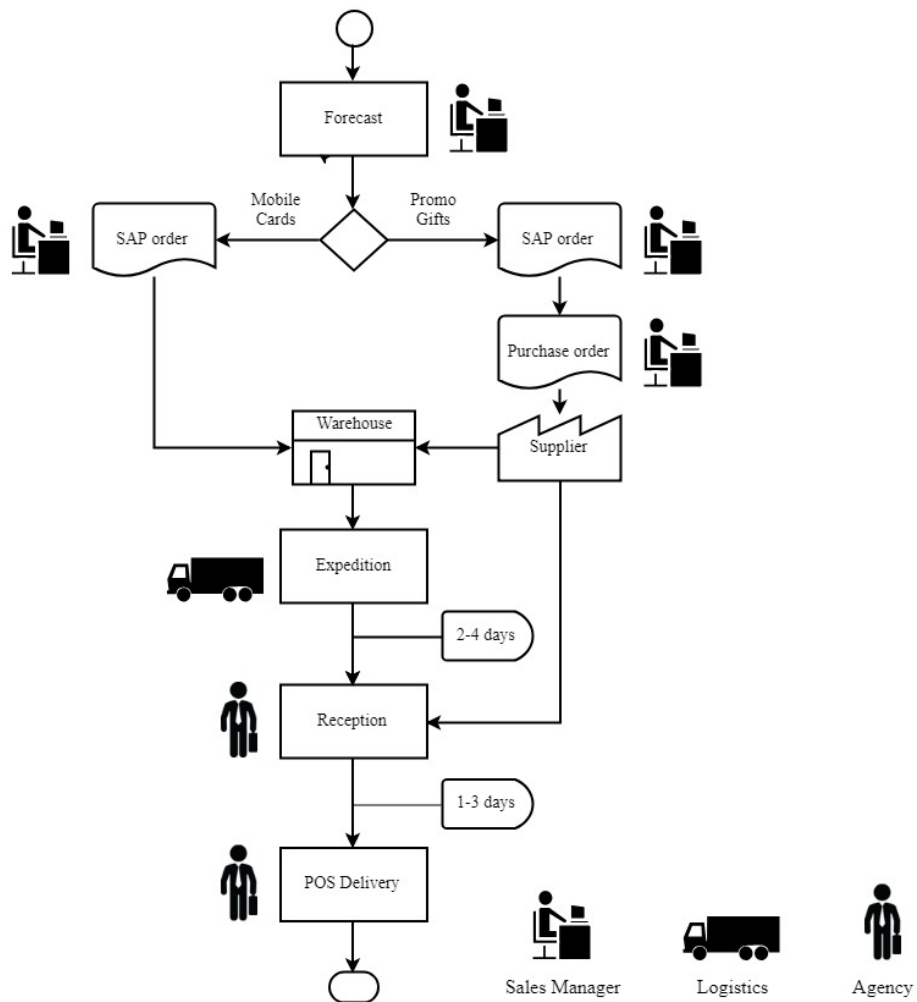
Appendix C

Logistics

Figure C.1: Current POS Logistic Supply Chain Process

This flowchart is merely illustrative and no notation rule has followed in its creation.
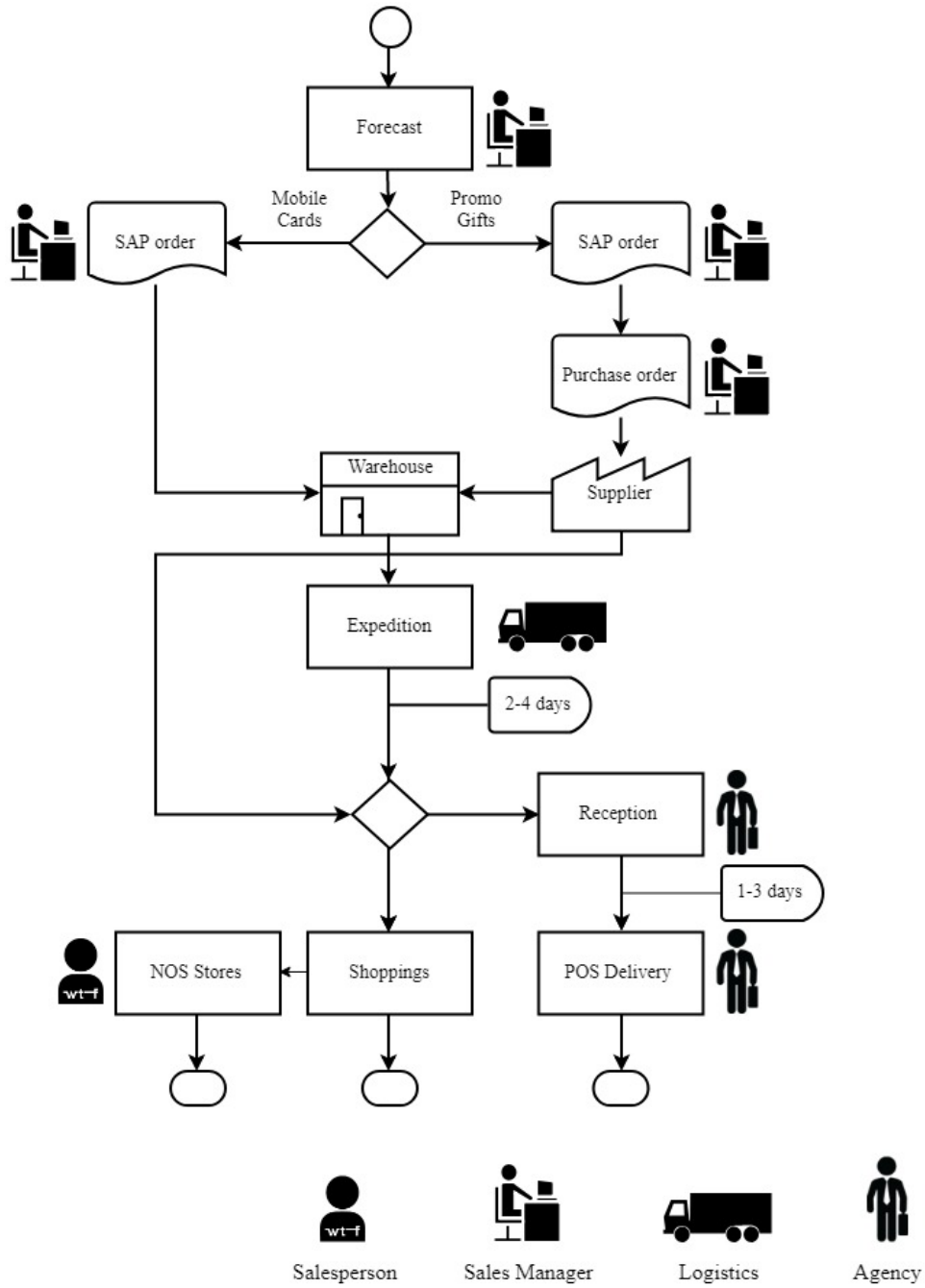
Figure C.2: New POS Logistic Supply Chain Process

This flowchart is merely illustrative and no notation rule has followed in its creation.