Optimization of Sales Ordering Process – Development of a Customer Segmentation Model

Ricardo Monteiro Marinho

Master's Dissertation

Supervisor: Prof. Bernardo Almada Lobo

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"Live as if you were to die tomorrow. Learn as if you were to live forever."

Mahatma Gandhi

Abstract

BA has registered an exponential business and operational growth over the last years, which has been demanding the transformation of the company's internal teams and structures over the time, resulting in the emergence of several challenges along the order to cash cycle, particularly in the sales ordering process.

Due to the lack of a customer segmentation strategy, processes are not being formally adjusted in order to drive priorities and focus. The almost exact same service level is provided for all customers, there are common transportation standards between clients and all of them share the same contact points with no differentiated treatment.

As a suggested improvement, the present work addresses this problem, through the construction and development of a customer segmentation model within the company. This model aims to divide and group the customers according to their relevance and value to the company, in order to enable the adjustment of the service delivery model for each one of the segments. These adjustments will allow the focus on the most valuable customers, or segments, with the purpose of increasing their service and, consequently, satisfaction level, while simultaneously reducing the cost to serve for low relevance clients.

In the end, the main goal proposed at the beginning of this project was achieved. After a long investigation and exhaustive analysis, the most appropriate variables to evaluate the value of each customer to the company were selected and calculated, together with the best way to differentiate them. Now, BA has a customer segmentation model that allows the company to optimize the sales ordering process, among others, by enabling the adoption of specific strategies and service models for each customer segment.

Its implementation has, therefore, become very promising and it will be a great pleasure to see its consolidation throughout the entire BA Group and check the benefits it will bring to the company.

Otimização do Processo de Ordem de Compra – Desenvolvimento de um Modelo de Segmentação de Clientes

Resumo

O crescimento exponencial verificado nos últimos anos, tanto a nível operacional como no ponto de vista do volume de negócios registado, comprovou ser a base para uma nova fase de transformação da BA Glass. A estrutura e composição da empresa veio consequentemente a experimentar diversas alterações, o que despoletou o aparecimento de algumas ineficiências, particularmente ao nível do processamento de ordens de compra. Uma vez identificada como insuficiente, a estratégia de segmentação adotada não permite a adaptação dos processos anteriormente referidos a diferentes níveis de priorização. De facto, existe até uma estandardização naquilo a que o nível de serviço diz respeito, fazendo com que todos os clientes sejam geridos de modo equivalente. Por exemplo, relativamente a meios de comunicação, pontos de contacto, e de transporte, corrobora-se a inexistência de priorização e personalização, em termos de serviço.

O presente trabalho serve como sugestão de melhoria aos problemas acima identificados, uma vez que se trata da construção e desenvolvimento de um modelo de segmentação de clientes, inerente e destinado à empresa. O objetivo é proceder à divisão do corpo de clientes, em grupos que representam valor e relevância distintos para a BA Glass, de modo a proceder-se ao ajustamento da estratégia de serviço utilizada para cada um deles.

Tais ajustes permitem focar a atenção em grupos, ou segmentos, que representam mais valias significativas a nível interno, para que a melhoria do serviço se espelhe em níveis de satisfação mais altos. Todavia, este modelo também permite, complementarmente, reduzir custos associados ao serviço de segmentos de menor relevância.

O cerne do problema apresentado foi devidamente estudado, e a solução mostra-se capaz de o adereçar. Análises exaustivas aquando do processo de investigação, permitiram identificar e calcular as variáveis cruciais à diferenciação de clientes de acordo com o seu valor, bem como selecionar qual o melhor modo de o fazer.

Este trabalho resulta num modelo de segmentação que permite à BA Glass otimizar o processo de ordens de compra, pela alocação de modelos de serviço e estratégias mais eficaz a cada segmento distinto de clientes. O desenvolvimento deste modelo de segmentação, como uma abordagem bastante promissora ao estado atual da empresa, é sujeito a uma implementação e monitorização contínuas, que serão prazerosas de acompanhar durante todo o processo de consolidação e verificação de resultados.

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To all, thank you very much!

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Abbreviations

BA	BA GLASS, SA
CRM	Customer Relationship Management
CS	Customer Segmentation
DM	Data Mining
GP	Growth Potential
KAM	Key Account Manager
O2C	Order to Cash
SA	Sales Assistant
SKU	Stock Keeping Unit
SM	Sales Manager
SOP	Sales Ordering Process
SR	Sales Revenue
TT	Transports Team

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1 Introduction

Throughout this introductory chapter, a framework of the project and the company where it was conducted is given, in order to provide some support for a better understanding of the current work to the reader.

This way, the reasons that led to the development of this project and its main purpose are briefly described and explained, alongside a short presentation and context of the company itself. Besides that, the methodology followed along the project and its structure are also indicated here.

1.1 Motivation and aim of the project

This dissertation was held in BA Glass Group, from this point forward referred to as BA, more specifically in the company's headquarters in Avintes, Portugal.

BA has registered an exponential business and operational growth over the last years. So, driven by market requests and needs, the company has been transforming its internal teams and structures, resulting in challenges along the order to cash cycle, particularly in the sales ordering process.

Currently, BA has no formal customer segmentation strategy, which means that:

- Processes are, in general, standard for all types of customers, with few occasional adjustments;
- Segmentation initiatives, when existing, appear to be mostly reactive and *ad hoc*, rather than specifically aligned with overall strategic objectives, and based on people knowledge;
- The existing segmentation relies heavily on basic criteria, instead of strategic insight driven methods.

Due to the lack of a customer segmentation strategy, processes are not being formally adjusted in order to drive priorities and focus. Almost the exact same service level is provided for all customers, there are common transportation standards between clients and all of them share the same contact points with no differentiated treatment.

In addition, the company is also beginning the Customer Relationship Management, hereinafter referred to as CRM, implementation process, albeit still at an embryonic stage. A customer segmentation strategy is an essential requirement for the success of this process and, therefore, emerges as an extremely important and necessary issue to approach.

This dissertation, conducted in BA's Business Development Department, addresses this problem, through the development and implementation of a customer segmentation model within the company. This model aims to divide and group the customers according to their relevance and value to the company, in order to enable the adjustment of the service delivery model for each one of the segments. These adjustments will prioritize and focus on the most valuable customers or segments, with the purpose of increasing their service and,

consequently, satisfaction level, while simultaneously reducing the cost to serve for low relevance clients.

1.2 Company Presentation

BA is a multinational glass container developer and manufacturer with more than one hundred years of existence. Some of the key milestones in the development of the company are:

1912 Incorporation of the company Barbosa e Almeida by the partners Raul da Silva Barbosa and Domingos de Almeida.

1930 Beginning of industrial activity in Campanhã (Porto). The company changes its name to Fábrica de Vidros Barbosa e Almeida, Lda.

1993 BA acquires 94,5% of CIVE - Companhia Industrial Vidreira, SA, from the state, a company located in Marinha Grande.

1998 Incorporation of the Spanish company BA - Fabrica de Envases de Vidrio Barbosa & Almeida, SA, (90,15% of the capital held by BA), and construction of a factory in Villafranca de los Barros.

1999 Acquisition, by means of Public Offer of Acquisition, of 54,3% of Vidriera Leonesa, SA (VILESA), a company with an industrial unit in Léon (Spain).

2008 Acquisition of the Sotancro Group which allowed the BA Group to broaden its product range and client portfolio.

2012 Acquisition of the Polish group Warta Glass, achieving a geographical expansion of its market to Eastern Europe, which represents a step forward into the Group's internationalization.

2016 Acquisition of HNG Global, a German glass packaging company headquartered in Gardelegen, West of Berlin, expanding its market into Central Europe.

2017 Acquisition of Yioula Group, composed of 4 plants in 3 countries: Greece (Athens), Bulgaria (Sofia and Plovdiv) and Romania (Bucharest).

No doubt, considering the aforementioned events, the constant transformation and growth of the company becomes extremely clear. BA's current vision is to "Wrap Dreams Beyond Packaging" which means it wants to go beyond making glass containers, aiming to take part in the customers' creation and innovation processes on a quest to support them in providing the consumers with unique experiences. Briefly, the company wants the customers to see it as a partner on their growth, innovations and disruptions, providing consistently quality and an excellent service in each delivery (BAGLASS, 2017).

It is also possible to deduce that the merging and acquisition of other companies in the industry have been one of the main corporate strategies in the pursuance of the so desired internationalization and increase of the market share.

As stated in its own website, at the present time, BA is present in 7 countries, with a total of twelve plants and 3.800 employees, producing over 8 billion containers annually and

distributing glass packaging to more than 80 countries around the world. The location of the company premises can be seen in Figure 1.1.

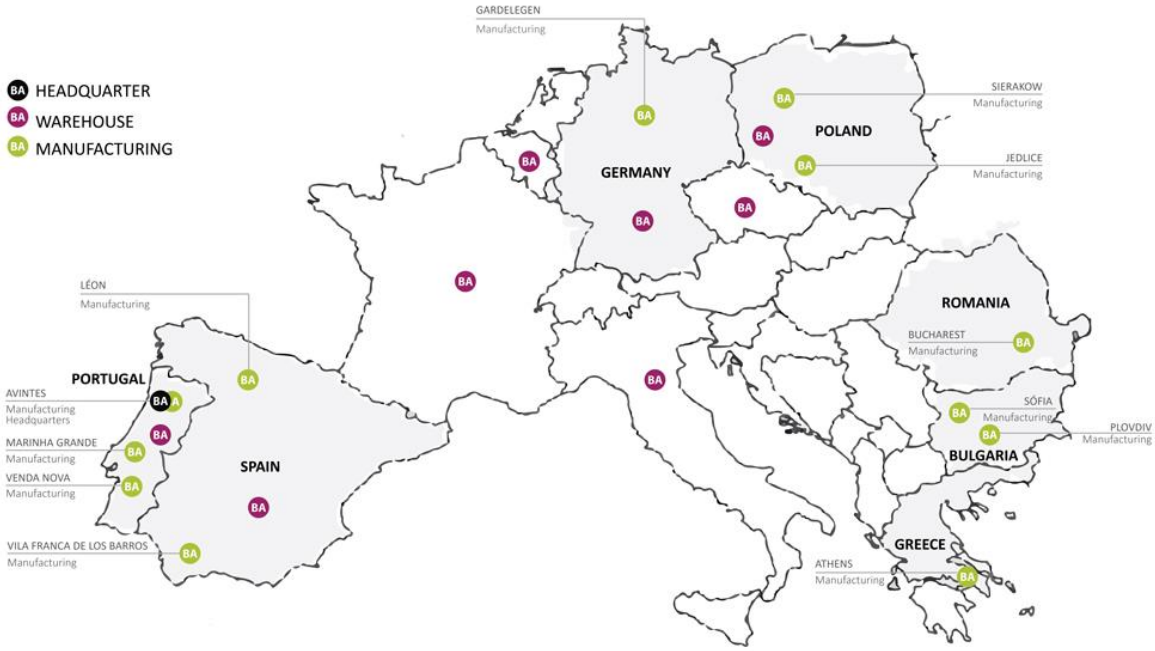

Figure 1.1: Location of BA Glass Group premises around Europe

BA became, then, a reference supplier of a wide range of glass containers all around the globe, standing out for the quality of its products and the ability to, together with the customers, find innovative and flexible solutions.

1.3 Methodology

The methodology followed in the elaboration of this project may be divided into four main steps:

- **Understanding of BA's proposal and investigation of the topic customer segmentation**

  This initial stage consisted on the first analysis of the company, its activities and processes, in order to completely understand the problem to be addressed and the proposal made by the company. Besides, it was also time to study the concept of Customer Relationship Management, and more specifically Customer Segmentation, its main goals and current state of the art.

- **Introduction to BA's databases and information available**

  This second phase allowed the introduction to SAP, its features and functionalities, and all the relevant company databases, mostly related to customers and sales information. At this time, it was checked all the available data and records that could be useful to the present project. Furthermore, some data disintegrations and lacks of important information were assessed.

- **Understanding of customers' behavior and value for the segmentation**

This step was absolutely critical and was based on the analysis of all the data and information that could be meaningful to evaluate and classify the customers according to their behavior and, most importantly, their value to the company, not only now but also in the future. After this process, the necessary data that available was treated and organized, while the data unavailable was collected from the appropriate people.

- **Segmentation model and service levels definition**

Finally, this last moment corresponded to the actual process of building and developing the customer segmentation model, by choosing the most adequate criteria and segments in order to completely customize the model to BA. Additionally, the service delivery model adjustments, aiming to prioritize the most valuable customers by optimizing their service level, were also defined.

The project planning is more detailed in Appendix A.

1.4 Dissertation Structure

The present report consists of six chapters and several appendices.

After this introduction, in the second chapter, a literature review on the evolution of management strategies until the well-known Customer Relationship Management, a completely customer-focused approach, and the customer segmentation, fundamental step on the shifting of companies' focus and, therefore, on the implementation of CRM. This section aims to provide a framework of the problem addressed by covering the most relevant topics related to it.

Next, in chapter three, a detailed presentation of the company where this project was developed is provided, with special focus on its current sales ordering process, which was the main aim of optimization. It has the purpose of enlightening the context that led to the problem engaged in this dissertation.

On its turn, chapter four presents the solution found and suggested for the problem at hand, which corresponds to the construction and development of a customer segmentation model. It is built with the intention of being totally customized for BA and aims to group the customers according to their present and future value, making it possible for the company to drive sales and service delivery strategies towards the increase of the satisfaction and loyalty levels among those who are most important and valuable for the company.

Following the description of the proposed solution, chapter five consists on the analysis of the validity and capability of the Customer Segmentation, from now on referred to as CS, model developed and, subsequently, on the presentation of the results obtained through the implementation of this model in the context of BA and its customer database.

Finally, the sixth and last chapter contains the conclusions drawn from the project carried out and the interpretation of its results, as well as some prospects for future work, both in the field and in the company.

2 Literature Review

This chapter covers on the most relevant topics to the matter under consideration, so that a framework of the problem is provided. This way, each topic is presented, alongside with a brief review of the existing literature, in order to understand their significance and evolution since they first emerged until the present.

2.1 Customer Relationship Management

Nowadays, the concept Customer Relationship Management, is well known by any company, in any business field, all around the globe. Briefly, it is a customer-focused business strategy that dynamically integrates sales, marketing and customer care service in order to create and add value for the company and its customers (Chalmeta, 2006).

According to Toor (2009), retaining and enhancing relationships with current customers is the number one business issue, followed by attracting new customers. In fact, in the current context of fierce market competition, CRM has become the main means for enterprises to gain competitive advantage and an important option for enterprises to make strategic planning (Lai, 2009). Of course, this was not static, but instead, the result of a constant evolution over the years.

2.1.1 The emergence of the concept

In the last century, as a result of the recent industrial revolution, the competitive landscape was characterized by mass production and a belief that the key to gaining a competitive advantage over the competitors was the quality and efficiency of the business processes and activities. Thus, the companies and vendors were mainly worried about lowering costs and increasing productivity, satisfying customer needs in general with standardized products and neglecting the individual relationship with each one of those customers.

However, the economic globalization and rapid technological development are completely changing the environment for enterprises, making them more dynamic and complex (Pan & Wang, 2010). The constant appearance of new players in every business area and consequent increase of the market competition led to a great customer empowerment, as they were having more and more choice options and, becoming aware of each company's offerings, started being more informed and, in this manner, gaining better decision-making capabilities, as well as having higher expectations.

Figure 2.1, taken from the study "The CX-Factor: Unravelling Customer Experience Leadership, carried out by SinnerSchrader, one of the Europe's leading digital agencies, presents some interesting facts and characteristics of today's costumers.

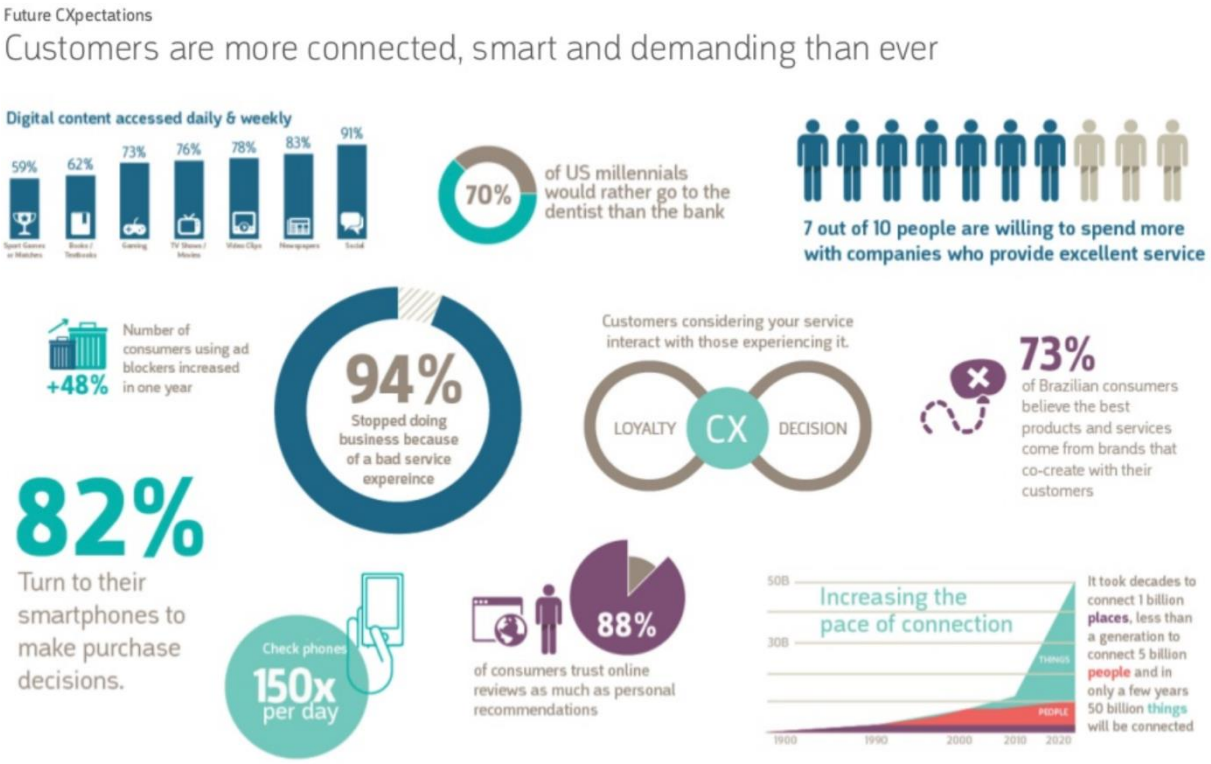

Figure 2.1: Some characteristics of today's consumers (SinnerSchrader, 2016)

As a result, mass production and mass marketing techniques began to lose effectiveness therefore being no longer enough of a strategy. As for optimizing internal processes, even though it is a necessary condition to remain in the market, but ceased to be a competitive advantage (Dyche, 2001). From that moment on, as stated by Boon, Corbitt, and Parker (2002), differentiation from competitors started being based on the speed with which a company was capable of responding to the requirements and demands of the market with innovative products and services.

Over the last couple of decades, many different organizations became, then, aware of the importance of providing customers' needs, accepted the strong relation between customer satisfaction and profit and, also, realized that maintenance of existing customers was much cheaper than attracting new ones (Beyadar & Gardali, 2011). Soon after, companies recognized the urgency of shifting their mindset from selling products to serving customers and increasing customer satisfaction turned into a fundamental operational goal of every one of them.

Each customer wants to be treated in a prompt, effective and personalized way, not like just one more. So, building and preserving close relations with customers, understanding their needs and preferences was of paramount importance. Likewise, the need of total integration of customer information was clear, once it allows to more adequately serve the customers and is essential to generate a higher level of customer satisfaction, decisive factors on the success or failure of an organization.

In accordance with Cooper (2002), although customer's care had always been a basic rule of commercial activity, companies needed a new form of organization, more focused on the customers, which allowed them to maximize the value that the customers could expect from them and see, from information derived from the customers, opportunities to establish business strategies (Figure 2.2).

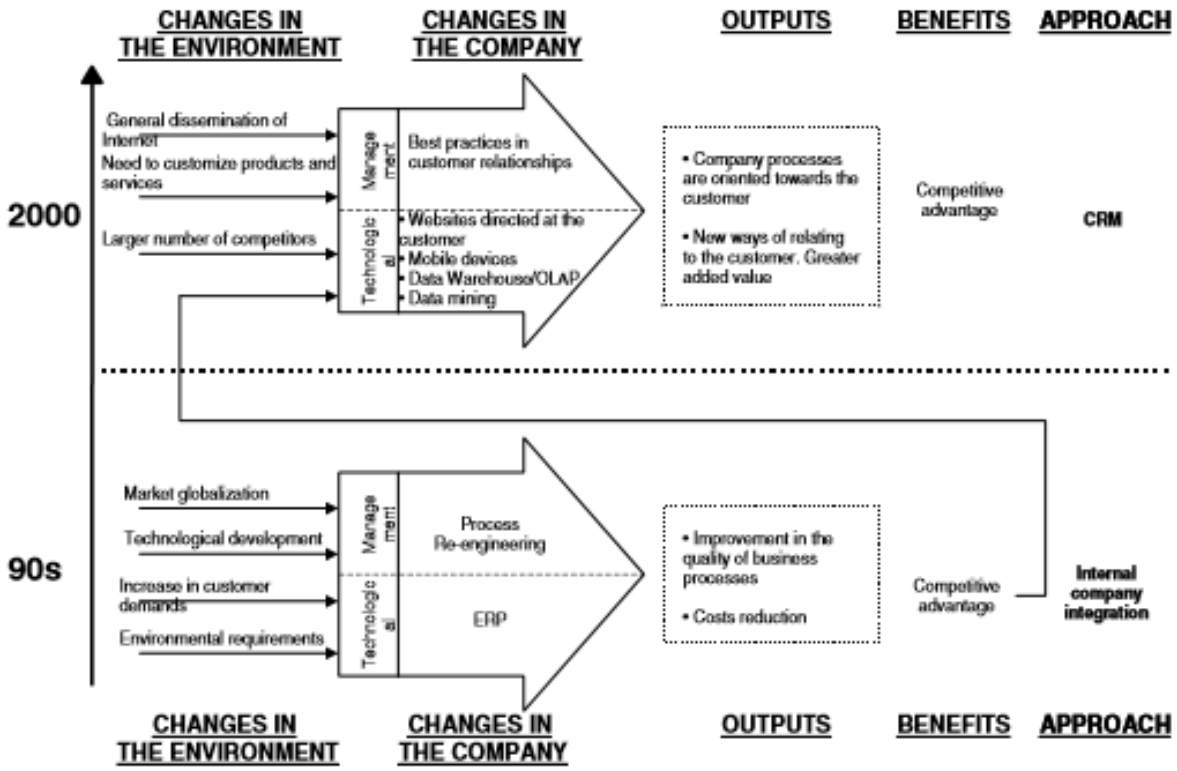

Figure 2.2: Evolution of the technological and management approaches (Chalmeta, 2006)

For this reason, organizations started, in essence, moving away from product- or brand-centric marketing toward a customer-centric approach or, in other words, being organized around the customer, instead of the product (Chen, Zhang, Hu, & Wang, 2006). Customer-centric organizations seamlessly integrate marketing and other business processes to serve customers and respond to market pressures. Firms that evolved to this stage benefited from a marketing-manufacturing interface, resulting in the flexibility to meet changing customer needs efficiently and effectively (Prabhaker, 2001).

Getting to know each customer, mostly through data mining (hereby DM) techniques, and a customer-centric business strategy, helps the organization to proactively and consistently offer more products and services while improving customer retention and loyalty over longer periods of time, according to J. and Karen (2003). Customers are regarded as important strategic resources of an enterprise, and whether an enterprise can gain, retain and develop its customers has become the most critical factor of an enterprise's success (Lai, 2009). Hence, the concept of CRM emerged. The central differences between the traditional marketing and CRM are displayed in Table 2.1.

Table 2.1: Difference between traditional marketing approaches and CRM

Traditional Marketing	CRM
Main goal is to expand customer base and to increase market share by mass marketing	Main goal is to establish a profitable, long-term, one-to-one relationship with customers
Product oriented view	Customer oriented view
Mass marketing / mass production	Mass customization, one-to-one marketing
Standardization of customer needs	Close customer-supplier relationship
Transactional approach / relationship	Relational approach

2.1.2 The motivation for CRM

As a separate research and business area, due to all the aforementioned reasons, CRM started to be a topic of attention among scholars and practitioners in the early 1990s (Saarijarvi, Karjaluoto, & Kuusela, 2013) and, since then, a more proliferated interest in such topic had significantly developed. Despite having become widely recognized as an important business matter, there is no universally accepted definition for CRM (E.W.T., 2005), mainly because, as stated by Christopher (2003), as CRM evolves, richer definitions are emerging, with an emphasis on its goals, logistics and complex character. Nevertheless, some consensual definitions are currently fairly accepted.

Pan and Wang (2010), defined CRM as a new business management model, that integrates philosophy, organization, technology, as well as a new management mechanism, which positively strengthens the relationship between businesses and their customers, namely by offering the right products to the right customers, at the right time through the appropriate manner. Once based on modern communications' technology, there is an adjustment of the traditional operations and business decisions, by focusing them more around the costumer and its needs, thereby increasing retention levels and loyalty, as well as customer acquisition and thus profitability for the whole enterprise.

The integration of scattered, isolated customer data in enterprises, by means of CRM, represents a strategy to enhance service levels and obtain a comprehensive view over the business and its market (Longyi and Yansheng (2009)). This is because the nature of such data can serve as a foundation for personalization, consistent delivery of quality products and services, as well as supporting business and operational decision-making processes.

By analyzing these definitions, according to Beyadar and Gardali (2011), one can conclude that the reasons behind the organizations' movement towards using CRM, may be extrapolated out of these three following fields:

1. Customer centralization

   Referring to Greenberg and Sullivan (2001), centralization is of the following subject matters:

   - Having an integrated, single view of customers, by means of analytical tools;
   - Managing customer relationships in a seamless manner, regardless of the communication channel;
   - Improving the effectiveness and efficiency of the processes involved in customer relationships.

2. Traditional marketing experiences

   Traditional marketing approaches, previously practiced by many organizations, resulted in several acknowledgeable points. Beyadar and Gardali (2011), exalt them with the following examples:

   - The expense of selling production to a new customer is 6 times higher than selling to an older one;
   - The probability of selling one production to one old customer is about 50 percent, whereas, the probability of selling the same production to a new customer is only 15 percent;
   - If a company increases the rate of keeping and maintenance of customer about 5 percent, it can enhance its profits between 30 to 125 percent.

3. Achievements

The most notable improvements that can be predicted are (Bergeron, 2001):

- Greater customer satisfaction, through offering a better service;
- Greater business coherence, defining corporate objectives linked to customer satisfaction;
- Managing to increase the number of customers and secure greater loyalty thanks to the reorganization and computerization of business processes surrounding the customer relations life-cycle (sales, marketing, and customer care services);
- Improving and extending customer relationships, generating new business opportunities;
- Knowing how to segment customers, differentiating profitable customers from those who are not, and establishing appropriate business plans for each case;
- Increasing the effectiveness of providing customer service by having complete, homogeneous information;
- Lower costs;
- Sales and marketing information about customer requirements, expectations and perceptions in real time.

CRM is not merely technology applications for marketing, sales and service, but rather, when fully and successfully implemented, a cross-functional, customer-driven, technology-integrated business process management strategy that maximizes relationships and encompasses the entire organization (Goldenberg, 2000), so its implementation involves significant changes in the organization and operation of each company. Hence, effectively and successfully implementing a CRM system is a critical management action for firms wanting to increase customer loyalty and to pursue higher business performance (Cheng, Yang, & Teng, 2013).

As a matter of fact, while there are many advantages of CRM, most companies are not close to achieving the maximum of those benefits. With data scattered across various divisions, isolated databases and fragmented records, most companies have yet to assemble the proper foundation to provide themselves with a complete view of their customer (Bose, Hashemi, & Rebhun, 2006). Conforming to Chalmeta (2006), one of the main reasons for this lack of success is that the existing methodologies being used to approach a CRM project are not adequate, since they do not satisfactorily integrate and complement the strategic and technological aspects of CRM.

Ensuring customer satisfaction and maintaining long-term relationships with customers have become a great competitive advantage and absolutely essential for every company. According to the Satisfaction-Profit Chain principle (Anderson & Mittal, 2000), improving product and service attributes causes increased customer satisfaction, increased customer satisfaction leads to greater customer retention, and improving customer retention leads to greater profitability.

As stated by J. and Karen (2003), beside the technological advances, CRM initiatives represent a fundamental shift in emphasis from managing product portfolios to managing portfolios of customers, necessitating changes on both business processes and people. Organizations today must focus on delivering the highest value to customers through better communication, faster delivery, and personalized products and service. So, companies that successfully implement CRM will reap the rewards in customer loyalty and long run profitability.

In fact, Haenlein and Kaplan (2009) reported that companies in all industries have been investing hundreds of millions of dollars in the implementation of CRM systems, being the global CRM software market worth US$3.6 billion in license revenue in 2006, according to a study conducted by Datamonitor, an international company that provides market intelligence and data analysis via a worldwide network of in-house analysts.

The explosion of interest and investment in these systems is extremely obvious as Future Market Insights, a leading market intelligence and consulting firm, states in a report published last year, forecasting that the market will reach a figure of about US$62.2 billion in 2022. Also, Forbes published an article about this exponential growth of the CRM software over the last few years, comparing it to some other worldwide enterprise software solutions, which is exhibited in the Figure 2.3.

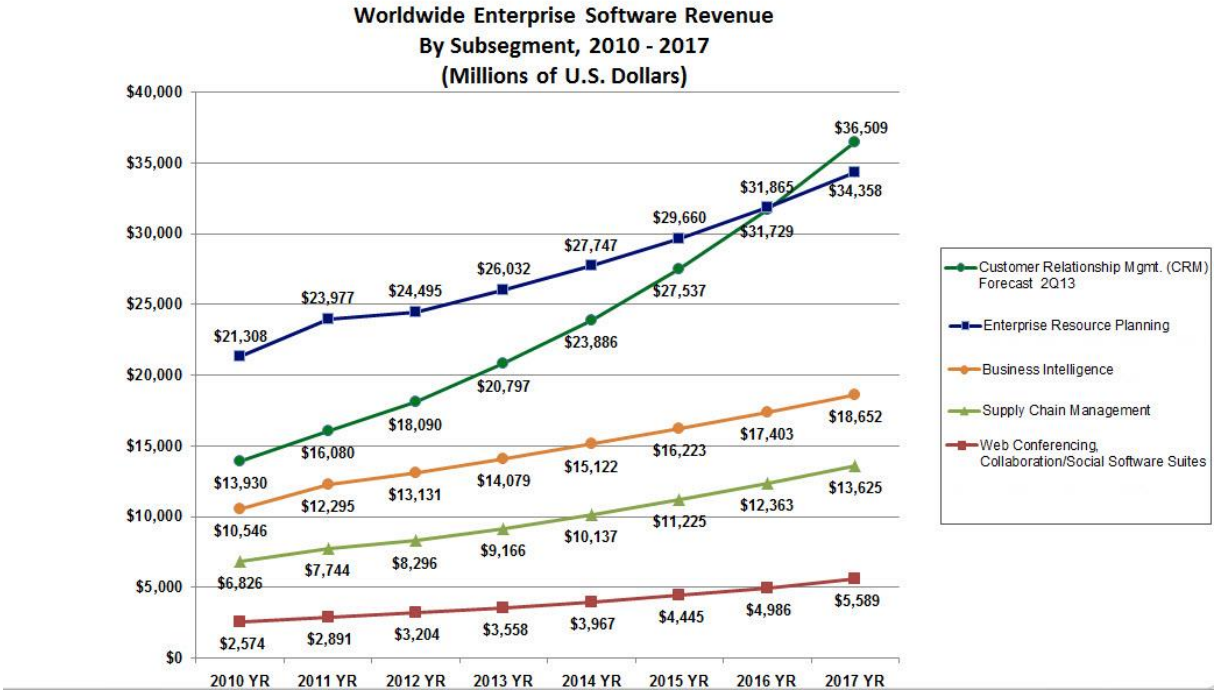

Figure 2.3: Evolution of the worldwide enterprise software revenue (Columbus, 2013)

2.2 Customer Segmentation

As alluded before, the rapidly changing and highly competitive global market, characterized by continuous innovation and increasingly challenging demand, clearly raised a need for building a stronger strategy focused around costumers. Under these new circumstances, companies focused on customer maintenance, through the application of continuous improvement on service levels, as to meet customer requirements and increase their satisfaction.

For Kim, Jung, Suh, and Hwang (2006), corporate success depends on an organization's ability to build, and maintain, loyal and valuable customer relationships. Hereafter, studying customer value became relevant. Even though disputable, a consensus seems to be emerging around what may define costumer value. From Ulaga and Eggert (2006), it is perceived as a trade-off between benefits and sacrifices, within use situations. Further, organizations are realizing that customers have different economic value to the company, and they are subsequently adapting their customer offerings and communications strategy accordingly (Chen et al., 2006). Additionally, the authors comment that, ultimate and continuously, firms acknowledge the accuracy of the Pareto principle - 80% of the sales come from 20% of the clients, in the context of this problem.

Consciously perceiving that all customers have different needs, preferences and characteristics, constitutes the foundation of any contemporary marketing strategy, and firms should strive for accomplishing appropriate customer relationships, besides providing customized service.

By performing a combination of the last two considerations, an idea of personalized service could be one in which profitable customers receive a set of extra benefits, while the unprofitable ones do not deserve that kind of treatment (Haenlein & Kaplan, 2009).

Consequently, it is necessary to measure the true value of each customer and build proper strategies to retain the profitable ones. As highlighted by Witschel, Loo, and Riesen (2015), many companies began to see a potential competitive advantage by extracting knowledge out of the abundant data that they can collect about their customers' background, interests and behavior, as to identify the potential in each one. Notwithstanding the capacity to collect large amounts of data, the extraction of knowledge does not follow the same tendency. Hence the rise of DM techniques to analyze data resulting from customers' activity, stored in large databases, as to detect possible patterns (Miguéis, Camanho, & Falcão e Cunha, 2012). Such patterns can be useful for understanding past and current customer preferences and behavior, as well as for forecasting what will happen in the future (Brito, Soares, Almeida, Monte, & Byvoet, 2015).

As a result, the emersion of customer segmentation, a concept introduced by Wendell Smith in 1956, has been extensively studied by marketers since then (Jiang & Tuzhilin, 2009). CS is the basis for CRM, once it raises companies' awareness about the needs and preferences of their customers, through the analysis and extraction of knowledge from the available data about markets and customers. Segmentation - with the incommensurable support of evolved database technologies, has been extensively used to make better operational, tactical and strategic decisions (Hiziroglu, 2013).

In the eyes of Wedel and Kamakura (2000), CS is a technique that allows companies to group customers into segments that share certain characteristics such as preferences or demand. Based on customer segments and an understanding of their meaning, product offerings and marketing strategies can be better targeted by distinguishing certain categories of needs (Witschel et al., 2015). It is impossible to meet every demand of every customer, ergo the segmentation task separates the costumers into several groups that are internally homogeneous and heterogeneous vis-à-vis the external members (Brito et al., 2015).

Recognizing differences within customers can be the key to successful marketing, since it can lead to a more effective satisfaction of customers' needs (Miguéis et al., 2012). In this manner, as reported by Jonker, Piersma, and Van den Poel (2004), CS is not a goal in itself, but rather a mean to an end. Such end is to enable companies to distinguish the customers and rate them with respect to a relevant characteristic, as to provide each segment with what is more appropriate. Indeed, CS can effectively lower the marketing costs of a company and help it achieve more visible and profitable market penetration (Lai, 2009).

Customer segmentation is a division of a customer base into distinct groups that internally share the same characteristics, i.e. there is a partition of data according to specific characteristics to analyze and exploit, in order to generate a meaningful basis for decision-making as well as delivering value. Hence, the objective of such technique is widely defined.

Since there can be noticed a significant development of information and communication technologies, it is essential to select a segmentation technique that is appropriate (Sarvari, Ustundag, & Takci, 2016). One finds in literature that segmentation approaches may be classified as technique or method- oriented. On technique-oriented approaches, also called "a priori", there is a primary activity of choosing variables of interest, i.e. number, dimension and description of different segments, followed by a classification of customers into those predefined sets (Chan, 2008).

Yet, under the unavailability to define those segments, since such stage is mainly based on the judgement of the responsible personnel (Brito et al., 2015), a "post hoc" segmentation

approach is undertaken. This method-oriented technique allows for the identification of segments/clusters after a methodology, for example, clustering, is applied.

It is equally relevant to refer that the basis for performing a segmentation technique can be induced either by the necessity to exploit the market, therefore conducting an analysis of aggregated and impersonalized data, or by the need to acquire a higher level of retention from current customers – then, it is made use of personalized, fragmented data (Hiziroglu, 2013).

Which value to deliver, and to whom should it be delivered (and by which means), are the fundamental decisions behind CS. Therefore, extracting knowledge must follow the selection of, or at last, focus on the appropriate variables. Traditionally, and thus providing a more general result, those characteristics were mainly demographic, transactional and empirical (Chan, 2008). However, the diversification of interests, needs and behaviors, found in the wider collection of data that is possible to gather nowadays, due to the combination of various information systems, makes it no longer sufficient to analyze those characteristics. This yielded to a more effective approach, that extracts behavioral data from transactional one, hence creating a basis to explore the results through clustering – a DM technique (Miguéis, Camanho, & Cunha, 2011).

Thereby, complementary tools like data mining and CRM, allow an enterprise to create internal and external value, by leveraging the existing, complicated data into a more significant one that exalts patterns and potential (Lai, 2009).

As stated by Seret, Maldonado, and Baesens (2015), supporting decision-making processes with data mining techniques is being widely applied by companies which are interested in monetizing the data that derives from transactions and utilization behaviors. Clustering algorithms, as a predominant unsupervised data mining technique for generating customer segmentation tasks, consists in the dissection of the data set into clusters, i.e. groups of data points that share certain similarities. Hence, the first step for such methodology is the definition of a similarity measure – points that are similar to a maximum value, belong to the same cluster, yet those who are maximally dissimilar do not belong (Witschel et al., 2015).

The before mentioned similarity measure is used on hierarchical clustering methods, in which clusters are generated based on the similarity of a couple of data points. On the contrary, partitioning clustering, e.g. K-means, is served off a cluster center, to which data points are allocated into the nearest cluster (Kuo, Mei, Zulvia, & Tsai, 2016).

In the case in which the features to be used for clustering are previously defined, the RFM model is widely used. Such approach basis itself on three essential attributes - recency of purchasing behavior, frequency of transactions and monetary value of purchases, which can ultimately be exploited to infer levels of loyalty and profitability. As said before, these measures may differentiate existing customers, and serve as a source for adapting the current strategy to a more personalized one (Peker, Kocyigit, & Eren, 2017).

To conclude, grouping similar points within a data set would be that of a sufficient method, as long as there is no relative importance between clusters due to the panoply of variables involved – in such cases, other analysis must be combined to obtain an effective CS (Gucdemir & Selim, 2015).

3 BA Glass

Following the previous brief presentation of BA, in this chapter, a more detailed overview of the current status of the company is provided, with the purpose of enlightening the context that led to the problem addressed in this dissertation. Additionally, the Sales Ordering Process, which represents the main focus of optimization, is also carefully described, alongside the main challenges identified and the proposed improvements.

3.1 Current Status

As mentioned in the first chapter, the acquisition of other companies in the glass containers industry has been one of the main corporate strategies for the expansion and internationalization of BA. Most recently, in the beginning of the last year, the purchase of Yioula Group, composed by 4 plants in 3 countries, represented a huge challenge and change for the company.

The integration of these plants required enormous efforts by both new and old employees in the implementation of not only new processes and procedures, but also new ideas, values and vision. Of course, this is not an easy operation, at all, and always takes its time but, gradually, the results were achieved and they had a great impact on the company's performance. With the new geographies, BA was able to find more and better solutions to deliver its products and services in line with the needs of the market, growing its sales significantly (Figure 3.1).

Figure 3.1: BA's sales evolution

Last year, BA's turnover reached about EUR 807 million, being that exports account for around 25% of this value. It is practically the same as in the previous year, however, a significant increase is expected this year, due to the latest company acquisition. The main consumer segments currently are: Food & Oils, representing 31%, Beer 21%, Wine 16%, and Spirits & Porto and Soft Drinks, both with 15% (Figure 3.2).

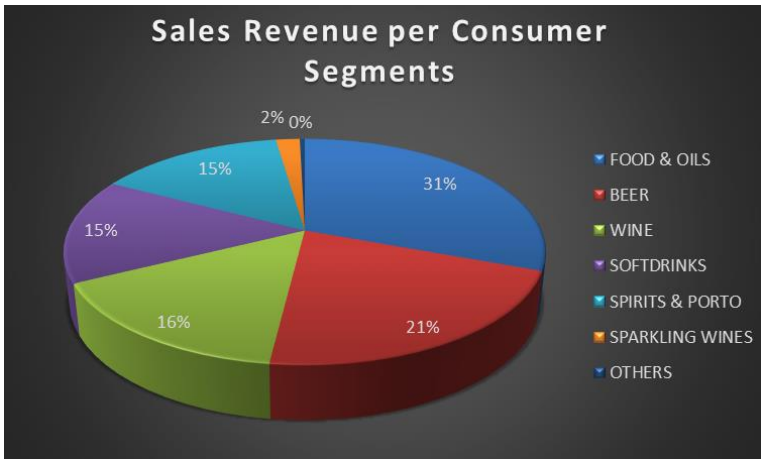

Figure 3.2: BA's sales revenue per consumer segment

Furthermore, the new plants allowed the offer of a wider variety of products, which, supported an extension of the customer portfolio, ensuring the diversification of market and credit risks, and led to an expansion of BA's potential for future business in new and current markets.

Figure 3.3 presents some current facts about the company that prove its exponential growth over the last years.

Figure 3.3: BA's current status

During the last few years, the evolution of glass container industry has been stable, slightly increasing year after year. Also, the pace of economic growth in Europe exceeded expectations during 2017, following the trend observed in the last quarter of 2016. These economic indicators, and the fact that glass is a highly sustainable material, are encouraging consumption growth and constitute good signs for the future.

However, the exponential business and operational growth BA has registered, driven by market requests and needs, has been constantly transforming the internal teams and structures of the company, resulting in some challenges and inefficiencies along the order to cash cycle. In fact, in a customer satisfaction survey carried out by an independent company at the end of the last year, BA only scored +9% in the Net Promoter Score, proving that the company has a lot of room to improve and better manage new markets and demands (BAGLASS, 2017).

Meanwhile, BA already started working on projects aiming to improve this satisfaction index and continue to provide an excellent service to all its clients.

3.2 Order to Cash - Sales Ordering Process – AS-IS Assessment

The Order-to-Cash (O2C) cycle involves all the necessary activities that an organization performs in order to deliver products and services to its customers. The vision of O2C comes with the purpose of optimizing the processes along the cycle to add value directly to the organization and ultimately to the end-customers that it serves. The value-added to the company can be measured in improved customer satisfaction levels, increased order volume, and reduced returns, among others.

The main scope of the present work is only a part of this cycle, more specifically, the Sales Ordering Process (SOP), as it is wanted to reduce cost-to-serve and improve service levels. During this project an AS-IS assessment of the current operating model was conducted, alongside a critical analysis and identification of improvement opportunities.

Still, the entire O2C cycle is presented, step by step, in the Appendix B.

3.2.1 Current Operating Model

The SOP includes every activity from the first contact with a certain customer until the invoicing of that customer's order. In any business, it is essential to have every process or activity well-coordinated, in order to assure a smooth workflow. Here, the SOP was carefully analyzed with the purpose of optimizing it, so that the level of customer satisfaction could also be maximized.

This process can be divided into five major stages, which are described, in chronological order, below.

Initial contact with the Sales Team

Logically, the whole process begins in the first contact between the customer and the company, which can be initiated by any of the two.

On the one hand, it may be the customer who, looking for a new supplier, takes notice of the work developed by BA and decides to get in touch with the company. In these cases, the initial contact, mostly by e-mail or telephone, is with the Sales Assistants (SAs), who should be fully prepared to answer any questions and provide all the necessary information regarding the company and its work.

On the other hand, sometimes, when it comes to a valuable customer and when there are strategic reasons, such as the will to increase its share in a certain market or country, or even enter a new one, it is BA itself to take the initiative to approach the client, with the purpose of promoting the company. In these situations, the first contact is through the Sales Managers (SMs), since they are the most qualified to sell BA's products and services.

Negotiation

This stage involves processes to support and execute commercial transactions, from price to commercial, financing and payment terms.

After the first contact, if the customer is interested in doing business with BA, either the SMs or SAs, depending on the situation, as described above, communicate that intention through the submission of a request for price definition in the system, so that they can make a proposal to the customer.

At this point, the Pricing Department receives an alert of request for price definition. This request is analyzed taking into account the market value, type of material and a cost analysis.

There is no standard table of prices, so an estimation of the potential cost of the product has to be made every time to guarantee the best option for profit maximization. During this cost analysis, interactions with other departments may be needed, as it involves:

- Variable costs;
- Fixed costs;
- Raw material;
- Moulds;
- Packaging;
- Transport.

A price is, then, decided and proposed to the SM or SA intermediating the negotiation, which triggers the approval flow. It starts by the SM, goes until the Key Account Manager (KAM),or market leader, or Chief Markets Officer and, in the end, the price is accepted or rejected. Depending on clients and price conditions being proposed, this flow may be longer or shorter.

After the price is approved, it is integrated in the system and the SM or SA receives an alert to communicate the price to the client. At the same time, financing and payment terms are also discussed and established with the client.

The process finishes here with the customer's acceptance or, in the case the customer does not accept the price or some changes are needed, starts again and goes on a loop. The pricing procedure is summarized in Figure 3.4.

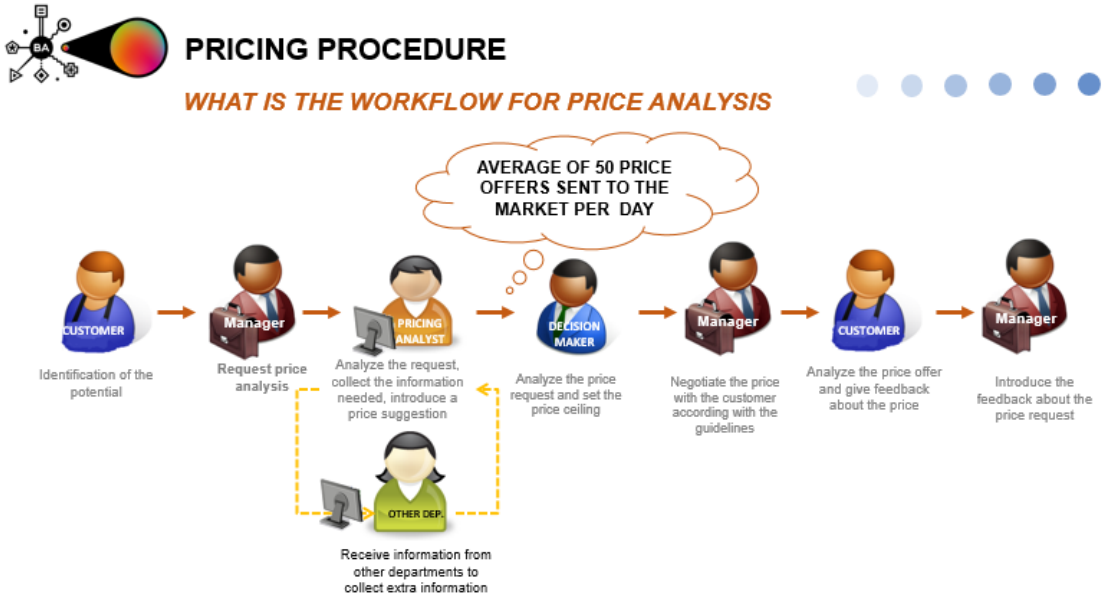

Figure 3.4: Workflow of BA's pricing procedure

Order management

This step includes the procedures involved in key components of order management such as receiving, analyzing order and stock, submitting order and managing changes or cancelations.

Accepted the price, the placement of an order by the customer follows. Orders can be made by e-mail, phone or fax, being addressed by the SAs. They receive the order and, immediately, perform some important validation, such as the identification code of the SKUs or the delivery address, communicating with the client if necessary to clarify information. Thereupon, it is necessary to analyze stock availability, which implies the interaction with Planning Department, SMs and eventually others, in order to assure the order is able to be fulfilled.

In the case that, for any reason, there is the need to make some changes to the order, SAs contact the client to align those changes and, if accepted, the order is adjusted accordingly and, then, it is placed in the system.

After the submission in the system, the customer is informed about the confirmation of the order and, also, a notification is sent to the Transports Team (TT) to report the need to arrange transportation for the order.

Order fulfillment

This phase incorporates the necessary activities to manage the delivery and return of products, based on multiple interactions, not only with clients but also with other departments, for delivery or pick up arrangements and creation of return orders.

After being notified of that need, the TT arranges transportation for the order and submits the details in the system, for instance the delivery date and time, the vehicle license plate, and several others. When the transportation details become available in the system, SAs forward this information to the customer.

Until the order is delivered, SAs must monitor it regularly and interact with other departments if needed to clarify any possible issue related to the order, like inability to fulfill it, delays, transports unavailability, etc. Alongside this monitoring, SAs are responsible to keep the customer updated at any time.

The management of the returns is very similar. After the delivery, if the customer has a complaint and wants to return part of the products, it contacts the SA and, together, they arrange a suitable date for the product to be returned. Once a date is agreed, the assistant inserts it in the system, opening a return order and generating an alert for the TT to arrange transportation. As soon as this arrangement is made, the TT places the information in the system and informs the SAs, which, in turn, notify the client.

When the return information is inserted in the system, also a notification is sent to the Finance Department, informing of the need to issue a credit memo to rectify the financial situation.

Invoicing

Finally, this last stage combines all the operations related with the creation, distribution and management of invoices and credit and debit memos.

The Finance Department is the responsible to control the invoices that need to be issued to the clients.

In the cases there is a complaint on the part of the customer, or product return, and, after a careful analysis, it is decided that the client should be compensated, the Finance Department is informed of the need to issue a credit memo and, after doing so, inserts it in the system, associating the reason that originated it.

Finalized this process, the memo is shared with the customer.

3.2.2 Identified Constraints & Proposed Improvements

The intensive and in-depth study of the SOP constituted the very first step of this work. As already mentioned before, the two main goals to pursue during this project were:

- Increase efficiency and reduce cost-to-serve;
- Improve service level and increase effectiveness.

Then, having a complete discrimination of how the whole process currently works, knowing all the people and departments involved and clearly understanding how the interaction with

the customer is made at each stage of the process was absolutely essential, so that, posteriorly, it could be carefully analyzed and evaluated.

The main purpose was to find the constraints that are causing inefficiencies along the process and, therefore, compromising the high service levels desired by the customers and that BA is fully committed to provide, because it represents a fundamental differentiating factor from its competitors.

From the conducted scrutiny and critical analysis of the process, five main hurdles were identified:

- There is no formal customer segmentation strategy driving service level adjustment, so all customers receive the same treatment regardless of their value to BA. This means that, sometimes, for any reason, small and insignificant customers require multiple interactions with SAs, being highly time consuming when it comes to order management and implying a high cost to serve them, which represents a very inefficient allocation of the company's resources.
- Processes are, in general, standard for all types of customer, being adjusted on a case-by-case approach, depending on the context, type of request or any other factors that may be important at the time, and with no formal service levels defined.
- Few ad-hoc segmentation initiatives, like managing to get stock available for certain clients or accepting late orders, are based on people knowledge and ad-hoc decisions and do not have any guidelines or standards.
- There is no single point of contact nor system to manage customer relationship and register all interactions and relevant information. The contact with the customers is mostly via email or telephone ending up getting too much information retained in people, especially in the SMs and SAs, not entering the organization and, even worse, eventually getting lost.
- There are no specific integrations adjusted to customer types. Currently, when available, BA uses customer's systems, portals or any other integrations but does not imposes any specific technology. Also, there are no different automation levels, such as self service capabilities, or pre-assigned points of contact, like a hotline for "gold" clients, for example.

In this manner, after the assessment of the current operating model and identification of its main constraints, two primary challenges were highlighted:

- How to increase efficiency and reduce cost-to-serve taking into account each customer complexity and relevance for the company?
- How to improve the relationship with customers through a consistent and error-free service delivery?

As a result, it was at this moment that BA decided to develop a customer segmentation model, with a proper and customized CS strategy and clearly defined adjustments to the service delivery model of each segment. Here arose, then, the project of this dissertation.

Beyond any doubt, a lack of a customer segmentation defined in order to adjust the service delivery model, driving priorities and focus, was evident. If correctly built and implemented, the main benefits a CS model could generate are:

- Increased customer service and service level for high value and/or high complexity clients and, therefore, increased customer satisfaction;
- Reduced cost-to-serve for low relevance and/or low complexity client and, consequently, increased results;
- Ability to adapt the model to support sales delivery model adjustments.

4 Segmentation & Service Model

One of the considered solutions for the challenges specified above, and the one addressed in this dissertation, is the development of a CS model, aiming to split the customer portfolio into well-defined and differentiated groups, based on their value and their relevance to BA. Once these segments are delineated, it becomes possible to drive sales and service delivery strategies towards prioritizing the fulfillment of the needs and requests of the high value clients and, hence, increasing customer satisfaction and loyalty.

This chapter describes, then, the entire process of creating and developing the segmentation model in question, from the first ideas and insights given by the stakeholders to the final definition of the service delivery model adjustments for each customer segment.

4.1 Segmentation Strategy Definition

As referred in the literature review, there is no standard segmentation model common to every business and industry that could be applied in all circumstances. Instead, in order to maximize the benefits from this effort, each company, having its unique characteristics and specific targets, must carefully establish a plan of action and develop its own customized model. This case was no different.

First of all, BA needed to define the CS strategy desired. So, a thorough research of the state of the art of this concept and its *modus operandi* was conducted in pursuance of the most discussed and consensual methods at the moment, its features, advantages and disadvantages. In addition, a benchmarking investigation was carried out with the purpose of assessing the CS strategies implemented by companies with a similar structure, even if in other industries.

As a result, three different approaches, with three different goals, were considered and meticulously analyzed, namely:

1. **Customer oriented segmentation, focused on buying behavior**
    - Looks for meaningful differences in the customer's behaviors - understands how they buy, why they buy, and how much they value the company's product, both from a historic perspective and from a future perspective;
    - Identifies associated clusters of customers around those differences (i.e. lifestyle, life stage, etc.);
    - Applies different sales and marketing offerings to meet the different needs of each segment;
    - Is mostly applied to business to consumer businesses;
    - Few examples of strategies used in this type of segmentation are:
        A. Discount Oriented;
        B. Quality Oriented;
        C. Quality and price oriented.

2. **Segmentation for corporate management and decision making**

- Identifies different customer segments based on financial indicators in order to support corporate management and decision making processes;
- Segments typically include major and relevant clusters of customers;
- Few examples in this case are:
    A. Major private label accounts;
    B. Major wholesaler accounts:
    C. Major global accounts.

3. **Segmentation for delivery model and service level adjustment**
    - Identifies different customer segments based on both quantitative and qualitative indicators, in order to adjust operational processes to each segment for service level differentiation (i.e. adapting technical services, customer service, sales channels, etc.);
    - Examples:
        A. + Share of wallet, + profitability;
        B. + Share of wallet, – profitability;
        C. – Share of wallet, – profitability.

BA wanted to group its customers based, not only on their financial worth but also on their importance to the company in both short-term and long-term. This action was absolutely critical to the ambition of adjusting the delivery model and service level according to each customer segment. This way, the third approach appeared as the most appropriate and, for that reason, was chosen.

Besides, a set of guidelines that must be taken into account was outlined, as a means to ensure the utility and effectiveness of the method to be adopted:

- **Actionable:** Segments should be defined in a practical and meaningful way, so that they can be used to develop different processes and procedures for each type of customer;
- **Transparent:** CS should be defined and clearly communicated to the whole organization;
- **Transversal:** Segmentation model should be applicable to all clients;
- **Discriminant:** CS variables should be discriminant, avoiding overlaps and presenting significant differences among segments that allow for a clear evaluation and positioning within a segment;
- **Adjustable:** Evaluation criteria and respective segments should be flexible, allowing future adjustments, considering the evolution of the goals and strategy of the company.

4.2 Segmentation Model Development

After reaching a consensus on the strategy and guidelines to be followed, the next stage was to begin the development of the segmentation model. To this end, an imperative meeting was scheduled with all the people involved in this project, i.e. the stakeholders, including:

- Business Development;
- Finance and consolidation;
- Information Technology;
- Corporate Supply Chain;
- Customer Service;
- Planning;
- Sales;

- KAMs;
- Others that, for one reason or another, were considered to be an added value to the conversation.

During this meeting, several critical issues were debated, gathering everyone's ideas and vision for the CS, in order to align them and clearly define a joint view and direction to take. This working session formed, then, the central basis for the development of the segmentation model, providing the necessary guidance to start the project.

Soon after, a careful analysis of the discussion held was conducted and some major decisions were made in regard of both the inputs and outputs of the project, starting by its division into three steps, which are now described.

4.2.1 Selection of the Type of Segmentation Model

The first subject addressed was the definition of the variables to enter the model. One of the guidelines previously defined to ensure the effectiveness of the segmentation was that it must be practical or, in other words, should not be too complex, but instead be simple to use and implement.

With that in mind, it was decided to adopt a matrix model, being, thus, restricted to only two main variables, one assigned to the x-axis and another one to the y-axis. A template of this type of model is represented in the Figure 4.1. Moreover, the number of customer segments was indirectly affected, being established that, at least in an initial stage, it would be limited to four. Nevertheless, it was also determined that this number would have to be tested later, to confirm if it was the optimal value according to, not only customer data but also BA's targets.

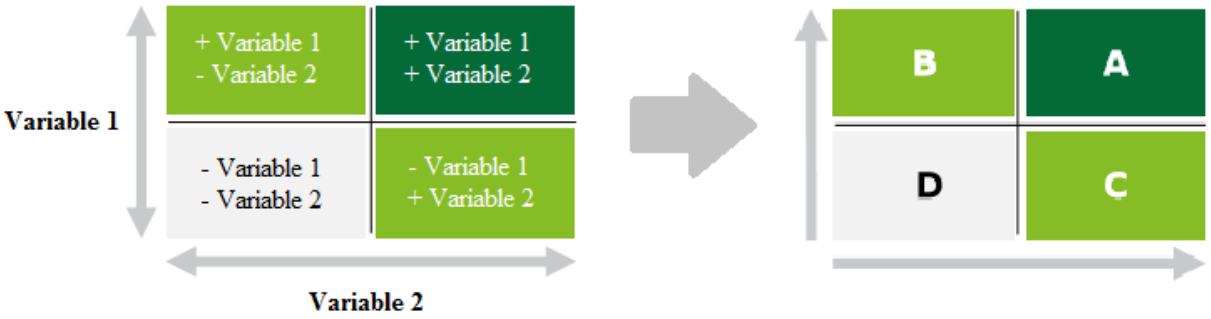

Figure 4.1: Template of a matrix model

4.2.2 Selection and Placement of the Segmentation Criteria on a Matrix & Definition of Reference Values

At this point, it was necessary to select two quantifiable criteria for the model, so an extensive brainstorming was started, gathering a series of variables that could possibly make sense to add, but taking into account the availability and difficulty of collecting the information needed.

These criteria were, then, characterized in accordance with their relevance, the kind of information they provide about the customers and, finally, the interpretation and assessment of the stakeholders.

The outcomes of this brainstorming session are synthesized in the Table 4.1.

Table 4.1: Analysis of segmentation criteria

Criteria	Relevance (1-5)	Information Provided	Final Assessment
Revenue	5	Customer relevance	The most important one. It is fundamental to measure the impact in the account if BA loses the client.
Profitability	1	Customer relevance	Information used only by the Board, not shared with all the company. Not to be included.
Share of wallet within the customer	3	Customer relevance	Relevant to assess BA's growth potential within the client.
Number of SKUs	2	Customer complexity	It depends. Relevant for C/D customers, but not for the A/B ones.
Number of markets	4	Customer complexity	Important to evaluate, not only the complexity of the client but also the opportunity to gain more share in current markets and possibly enter new ones.
Cost-to-serve	2	Customer complexity	Only relevant for C/D customers, whose costs must be rigorously controlled. As part of its strategy, BA will try to meet the A/B customers' needs and requests, even if that implies higher costs.
Brand vs private label	1	Customer business	Important to get to know the customer and its business, but not relevant for the segmentation.
Producer vs distributor	4	Customer business	Relevant. Dealers should not have the same privileges than the producers. Although, there are some exceptions for strategic reasons, like increasing the presence in a give market.
Exclusivity	4	Customer relevance	Important to evaluate BA's responsibility to the customer, for planning purposes. Being exclusive, any possible delay or failure on the part of BA will have a major impact on the customer.
New customer	1	Customer relevance	Not a differentiator factor for the segmentation.
Brand awareness	2	Customer relevance	Helps to assess customer's dimension and if BA wants to be with the client. However, by norm, if the client wants to grow with BA, BA wants to grow with the client.
Global presence	2	Customer complexity	Helps customer's dimension and complexity. Very similar to the "number of markets" criteria, though.
Financial health	1	Customer complexity	Always important to take into consideration, but not relevant for the segmentation.
Continuous supply flow vs occasional orders	2	Customer relevance	Number of cases not very significant for BA. Besides, it is also related the "producer vs distributor" criteria.
Potential of the customer	5	Customer relevance	Knowing the margin to grow in the future is essential to estimate the client's relevance in a long-term perspective. Although, not easy to measure.
Percentage of exclusive vs standard models	4	Customer complexity	Also important to know the value of the customer. Additionally, helps to infer the level of competition BA is dealing with.
...	...	...	...

After analyzing the information gathered, and being the most important variables for the calculation of customers' value, as it is possible to see in Figure 4.2 that was taken from an article published by Stratshire Consulting, the criteria chosen for the CS model to develop were: Sales Revenue (SR) and Growth Potential (GP).

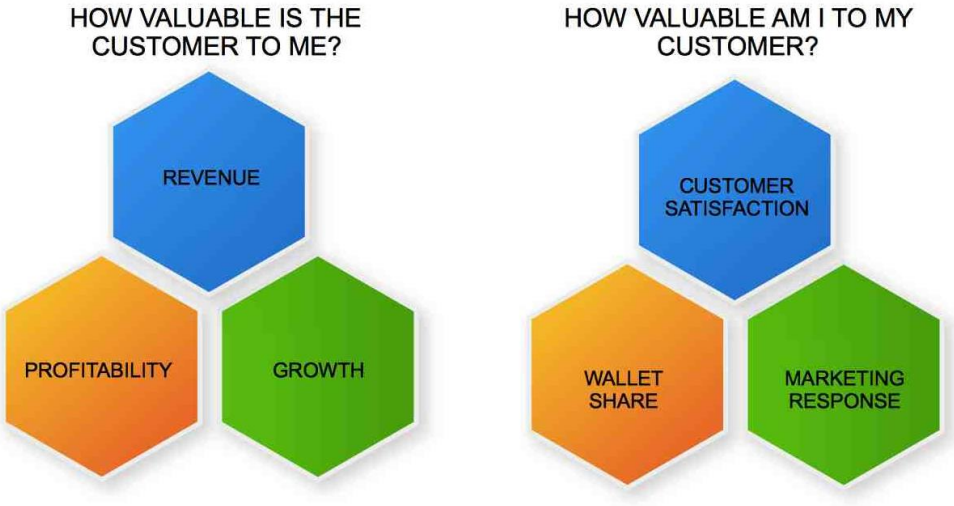

Figure 4.2: Parameters of customer value (Stratshire, 2013)

Sales Revenue

Undoubtedly, SR is a crucial factor and should always be taken into account, regardless of the business or industry. It might be said that the most basic need to run a business is yielding a financial profit and the primary essence of profitability is the revenue, alongside with the costs, i.e., in order to get greater profits, revenues must be raised or the costs decreased.

Basically, every enterprise lives on its revenues and, of course, BA is no exception so, unquestionably, maintaining the clients with great revenue is fundamental, which requires an outstanding treatment and service.

The SR of each customer is absolutely essential to assess its dimension and, especially, its value and importance the company. In other words, it is a proxy of the client's size and relationship relevance to BA.

On the other hand, it also helps to infer the kind of interaction with each customer. For example, higher SR means more orders and requests, which translates into more contacts between BA and the client. This implies the need to devote more time and have more resources available, as a means to meet its demands and, consequently, guarantee a high customer satisfaction and gradually increase its loyalty towards the company.

BA already had in its databases all the customer transaction records, organized annually, so it was not difficult to collect each customer's SR, during a certain time period. For this project, only the actual sales from 2017 and forecasted sales in the budget of 2018 were contemplated. There were more than 1,300 customers in the analyzed data, being that many were very small, with occasional purchases and, ergo, their revenue was not significant. Thereby, customers were sorted by decreasing order of SR and only those who were part of 99.50% of BA's total sales were considered. This selection process, and its results, are presented in Appendix C. The initial number of clients was, then, reduced to around 700.

Afterwards, the next step was to define a reference value for the SR axis, so that it was possible to discriminate each segment. There were several possible exclusively mathematical approaches to choose this value, like the average, median, 80%-20%, etc. However, once

again, as the ambition of building a model perfectly customized for BA was always present, the reference value was chosen according to the company's objectives.

As previously stated, one of BA's main ideas for the segmentation was, subsequently, being able to adjust the delivery model and service level to each one of the segments. This means that, the higher the segment, the more privileges and allocated people and resources customers will have, which also implies a higher cost to serve. For that reason, the number of customers in the higher segments had to be limited and strictly monitored.

This way, adopting a trial and error method, some values were examined with the data already collected. The results are presented in the Table 4.2.

Table 4.2: Analysis of possible reference values for the Sales Revenue criteria

Reference Value	Number of customers above the value	Percentage of customers above the value
500 000	237	18%
1 000 000	155	12%
2 000 000	82	6%
3 000 000	57	4%
4 000 000	45	3%
5 000 000	32	2%

Following the stakeholders' general view of the kind of privileges to offer to the more valuable customers and keeping in mind the costs they might entail, an initial idea was to have a percentage of customers above the reference value surrounding 5%. In the end, it was decided to use 2 million, not for any specific strategic reason, just because, being BA a company growing exponentially, accustomed to all kinds of risks, it only made sense to decide for the most ambitious option. Nonetheless, it was also established that this value would have to be tested every time the customer segmentation and, consequently, the data inserted into the model, were updated. The reference value fully depends on the context, so whenever it is changed, it must be reviewed in order to check if it is the one that ensures the best relation between the desired goals and the associated costs.

So, in short, customers' placement on the lower or upper quadrant of the matrix was evaluated through the analysis of total SR. The reference value considered corresponds to 2M€ of sales revenue (approximately 6% of BA's customer portfolio), and so, if a customer's total sales revenue is below reference, customer will be placed on the lower part of the matrix, if it is above, customer will be placed on the upper part of the matrix.

Growth Potential

GP, the second criteria chosen, is also an indispensable factor to measure customers' value, regardless of the business, being, then, a variable to consider in any CS model. If a company wants to expand an account, there has to be margin or the potential to do so.

In a long-term perspective, estimating the potential to grow within each client becomes extremely important as it helps the company to realize which ones might be more valuable in the future and, therefore, those with whom the company wants to be with.

Contrary to what may be the popular belief, customers' size or revenue are in no way related with BA's potential to expand within that customer. It is essential to get to know each one, understand the reason it is choosing BA, its expectations from the company and its aspirations in the long run, so that it is possible to determine if it is a client worth investing in.

Once it is determined that a valuable client has a high GP, the company should start thinking in ideas capable of incorporating opportunities to expand that meet the client's business objectives, allowing both organizations to grow together.

However, contrarily to the sales revenue, this information was not in any database and was not that easy to assess. So, in a first attempt, the question was asked to the SMs, since they are the ones who have a closer relationship with the customers and, thereupon, a deeper knowledge of them. However, it was soon realized that this was not the best way, because most SMs could not objectively quantify this value, answering, in most cases, that the GP was what BA wanted.

This way, another approach was adopted, dividing this variable into three smaller ones. Once again, during this process, the primary concern was to find a totally customized solution for BA and its needs. GP was, then, addressed taking into consideration the following questions:

- **Question 1:** Customer buys the remaining of their product portfolio to more than one supplier?

  The main point of this question is to infer the kind of commitment and relationship each customer has with its suppliers. Basically, it aims to analyze customers' willingness to change suppliers in order to assess the level of difficulty for BA to conquer that share, or some of it, by starting to deliver more products or more quantity to that customer and replacing the other suppliers.

- **Question 2:** SKUs being bought to other suppliers are within BA's current portfolio?

  The second question intents to figure out the reason why the customer buys products from other suppliers. It determines the fit between the customer's and BA's product portfolio, with the purpose of evaluating the complexity of a possible expansion within that customer, if it would require the development of new products or just adding more of the current SKUs.

- **Question 3:** What is the estimated share of wallet of BA products within customer's portfolio?

  Finally, the third and last question is the most significant or decisive of all. It aims to estimate BA's share of wallet within a certain customer, which essentially corresponds to the percentage of BA's revenue in the total revenue.

After the definition of these questions, again, the assistance of the SMs was asked, because, as mentioned earlier, they are the ones who know the customers better. This time, the questions were more objective and straightforward so, in spite of having been a lengthy process, since it was not easy to respond accurately to every customer, all the necessary information was gathered.

Once this part was over, it was then time to decide how it would be distinguished a high growth potential from a low one and, hence, how it would be the customer's positioning on the matrix. Since the relative importance of questions one and two was not the same as that of question three, the differentiation process was divided into two stages.

In an initial phase, the first two questions were analyzed. If the answer to both was no, it meant the customer does not like to highly depend on a single supplier, instead prefers to spread its purchases for several suppliers, and, moreover, there would be a high degree of complexity in a possible expansion within the customer, possibly being necessary to design and develop new products. So, if this was the case, the GP was considered to be low.

In a later stage, if the answer to any of the first two questions was yes, the question three would be analyzed. But first, it was necessary to define a value for the share of wallet from which the GP would be low, being that the reference value for the second axis. As there were no restrictions or limitations this time, the collected data was quickly analyzed (Table 4.3), being decided that the reference value to use would be the resulting mean of the values of share of wallet.

Table 4.3: Analysis of the results of the Share of Wallet variable

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Share_of_Wallet	703	.00	1.00	.4957	.35006
Valid N (listwise)	703				

The reference value defined was, thus, 50%. Nevertheless, just like the previous one, this value would also have to be tested whenever the CS model was updated.

This way, if any of the first two questions was answered with a yes and the estimated BA's share of wallet within the customer, i.e., the answer to the third question, was less than 50%, the GP was considered to be high. Otherwise, if the share of wallet was 50% or more, the GP was evaluated as low.

The process of measuring each customer's GP through these three questions and differentiating them based on that is represented in Figure 4.3.

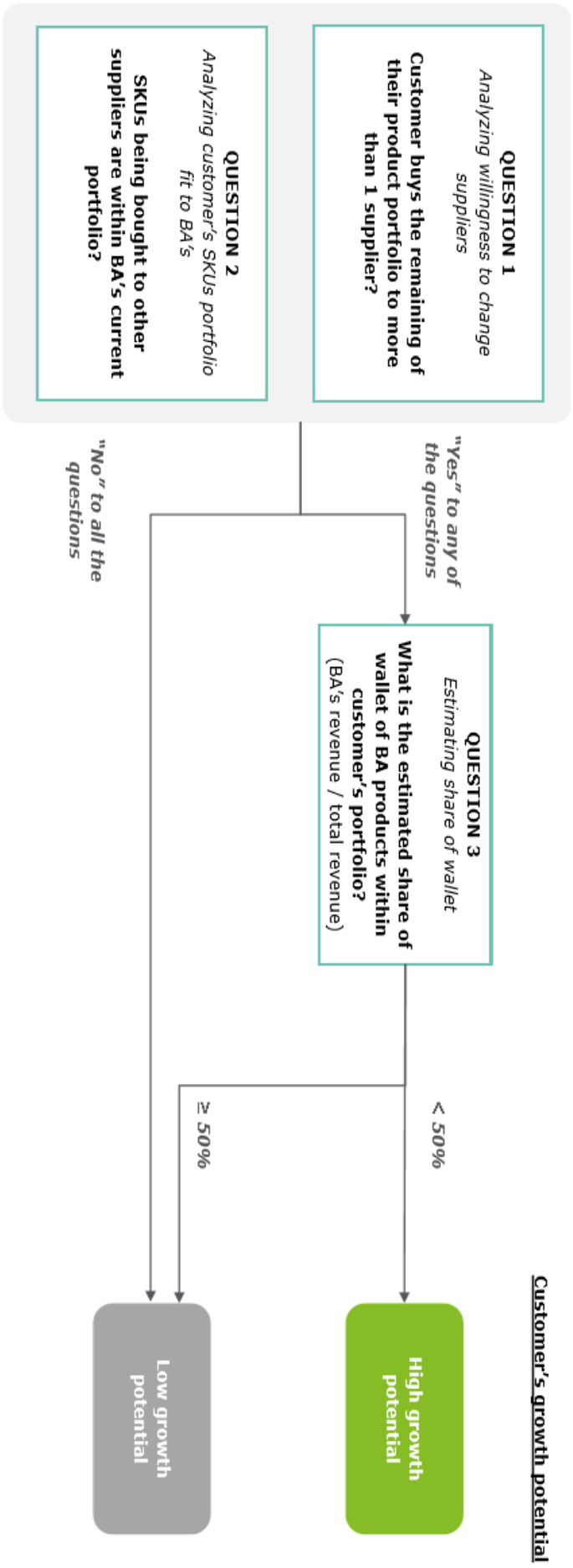

Figure 4.3: Assessment of the growth potential of each customer

In summary, customers' placement on the left or right side of the matrix was evaluated through the analysis of customer's GP, which is a proxy of client's future size and relationship relevance to BA. Customer's GP analysis was based on multiple questions, both qualitative and quantitative, that classify a customer as having a high GP (placed on the right side of the matrix) or low GP (placed on the left side of the matrix).

Finally, the resulting CS matrix is presented in Figure 4.4.

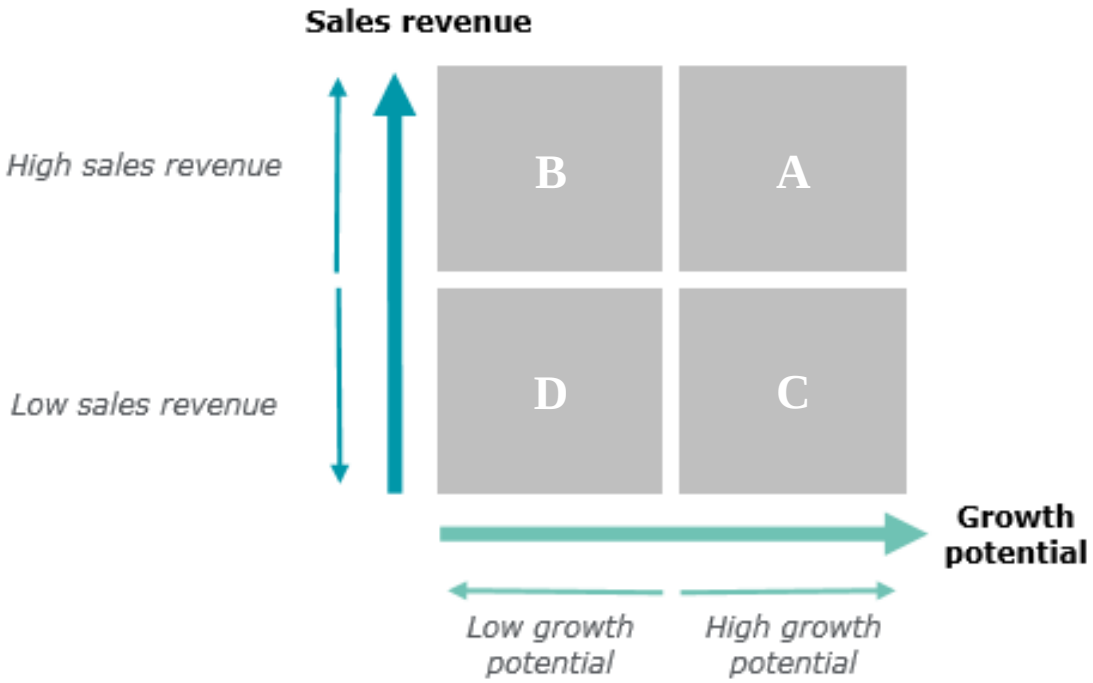

Figure 4.4: Resulting matrix segmentation model

4.2.3 Definition of Manual Adjustment Criteria

As it was already stated, the option for this type of CS model was mainly driven by the initial guidelines followed, which, among other things, advised that the model should simple and practical, with few variables, in order to make it more flexible and its implementation easier. This is a general guideline for the construction of any segmentation model though, so, its proper interpretation is not to stick rigidly with it, but instead use it as a basis to start. Later, it can, and should, be improved and personalized in each specific case, because every business and industry is different and every company has its own individual needs.

So being, and since it is possible to verify that several other relevant criteria have been identified, by analyzing Table 4.1, it was decided to add some manual adjustment criteria to the CS model. These criteria aim to allow a manual adjustment of the segmentation due to strategic reasons, despite the results obtained through the developed matrix model. Two examples of the effect of these criteria are shown in Figure 4.5.

Figure 4.5: Examples of segment adjustments

They correspond to important factors in the specific context of BA's business that also have a great impact on the assessment of the customer value, being important to the point of even making a certain customer go up or down one level in the hierarchy of the customer segments defined.

So, four new criteria were added at this point, according to their relevance, which is presented in Table 4.1, being now described in descending order of importance for the model:

- **Distributor**

  Distributors are not the final users of the products, acting instead like intermediaries between producers and customers. Through good service levels and the maintenance of close relationships with customers, they are able to form significant and very loyal customer portfolios. Thereby, it becomes extremely difficult to persuade those customers to change suppliers and so, sometimes the only way to get to them is really through a distributor.

  Being basically resellers, they usually have lower prices than the other customers, as they, after buying a product, still have to sell it to the final customer. In order to make this a viable and sustainable business, they need to charge a higher price to the customers than the one they buy from BA, so that they have a profit margin, but, at the same time, they have to assure competitive prices if they do not want the customers to leave them and just skip the "middleman".

  From BA's point of view, these customers, not only have lower prices, but also may have clients with whom the company would like to start trading directly, so they surely are not included in the target customers. Still, it should be noted that some strategic distributors are useful now that the company is entering new markets, as they help reaching more customers faster. Nevertheless, in general, these customers are less valuable, so, in the long run, BA wants to eliminate them.

  This information was easily collected, once it was available in BA's customer databases.

  As a result, if a certain customer is a distributor, its classification drops one level in relation to that initially calculated, going to the customer segment immediately below.

- **BA's exclusivity**

  This criteria checks if BA is the exclusive supplier for one, or more, SKUs. The fact that BA is the exclusive supplier of a product significantly increases the company's responsibility towards the customer. Being exclusive, if BA fails to meet the customer's needs, the customer will also not be able to meet the needs of its own

clients, which may cause the loss of significant revenues and possibly even clients, having, thus, a huge negative impact on the customer.

For its part, any customer, by trusting the total exclusivity of a certain product to BA, must expect both high quality products and high service levels, demonstrating, not only a great level of confidence, but also a, enormous level of commitment to the company. This proves that the client really values BA and it is betting on it, being these the clients the company appreciates and wants to continue growing with in the future.

With the exponential increase of the number of clients and products offered, more and more information started entering the company's databases that was not treated and organized in the best way, so a lot of valuable information gradually got lost. This particular data had that problem and it was not available in any database or transaction records. So, at that moment, the help of the SMs was required one more time, as they were again the most qualified and capable of gathering the needed information.

Therefore, this is also a highly valued factor and, in these cases, the customer goes up one level, when compared to its first assigned classification.

- **SKUs' exclusivity**

This variable aims to measure the weight of the exclusive SKUs among the total number of SKUs bought by the customer. It is a measure of both the complexity of each customer and its commitment with the company, also helping to assess the customer value.

Selling exclusive products implies an undoubtedly more complex process than the sale of standard models. The exclusive ones are often designed from scratch in collaboration with the client, activity that occasionally drags on for a long time until the desired solution is found. Additionally, they need their own production plan, which sometimes is not easy to reconcile with the other thousands of products that are planned to produce.

Investing in the design of an exclusive product with BA is a sign that the customer appreciates the company's work, including the quality of its products and services, since it is the, or one of the companies chosen, among so many competitors in the industry. Besides, it also represents a medium to long-term investment in the company, showing a high degree of commitment on the part of the customer and, consequently, increasing the value of that customer from BA's perspective.

The exclusivity is present in the company's product databases, so, extracting this information was a relatively simple process.

Being this a quantitative variable, it was also needed to define a reference value, from which is made the distinction between the clients that will be considered more valuable and those that will remain with the same classification. The data collected was analyzed, adopting a trial and error method one more time, in order to test the influence each value would have in the results. Also, the mean and standard deviation were calculated. The results of these analysis are summarized in Tables 4.4 and 4.5.

Table 4.4: Analysis of the results of the SKU's Exclusivity variable

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Weight_Excl	703	.00	1.00	.2472	.36565
Valid N (listwise)	703				

Table 4.5: Analysis of possible reference values for the SKU's Exclusivity criteria

Reference Value	Number of adjustments made /customers affected	Percentage of customers affected
10%	65	9%
20%	54	8%
30%	44	6%
40%	41	6%
50%	38	5%
60%	38	5%
70%	33	5%

Two factors were taken into account when deciding which value to use. First, it made no sense to choose a value below the average, so those were soon discarded. Second, in order not to excessively increase the number of customers in the higher segments, for the same reasons mentioned when choosing the reference value for sales revenue, it was decided to limit the influence of this criteria to 5% and, as a result, the value chosen was 50%. Just like the other reference values, this one should also be reviewed in future model updates.

Summing up, having exclusive products increases the customer value for BA. As a consequence, when the weight of the exclusive SKUs, among the total number of SKUs bought, is higher than 50%, the customer rises one level in relation with its first positioning in the matrix model.

- **Number of markets**

Finally, the number of markets checks if the customer is present in several markets. It is the last criteria added to the model, aiming to measure each customer's dimension and complexity.

Any enterprise with presence in different markets typically raises more awareness than a local one. For BA, it is always important to work with well-known customers and influential brands, in order to also promote and gain recognition for their work and quality. This, of course, if those customers are valuable to the company because that is definitely the most critical factor.

A global presence usually implies more requests, higher number of places to ship to, larger number of distinct SKUs being bought, etc. Along these lines, a customer present in distinct markets, that in this context mean countries, generally has a level of complexity superior to a local one.

Furthermore, a multinational customer also presents more opportunities to grow, both by increasing BA's market share in a given country and by the possible entrance into new markets in the future.

This information was present in the company's transaction records, as every order has the country where to ship to associated, so, its collection was also quick and simple.

Again, being this a quantitative variable, there was the need to define a reference value to distinguish the customers. In this case, the decided value was one, as it is considered that a customer becomes more valuable as soon as it is international, that is, once it is present in more than one market.

In this manner, if a certain customer is present in more than one market, it is moved up one level in the hierarchy of the customer segments.

In conclusion, despite customer's placement on the matrix according to the segmentation criteria, some manual adjustments should be considered in order to ensure the most perfect alignment possible with BA's strategy. When manually adjusting a customer segment multiple criteria may apply, for which a specific order of relevance must be considered.

This third step of the development of the CS model is synthesized in the Figure 4.6.

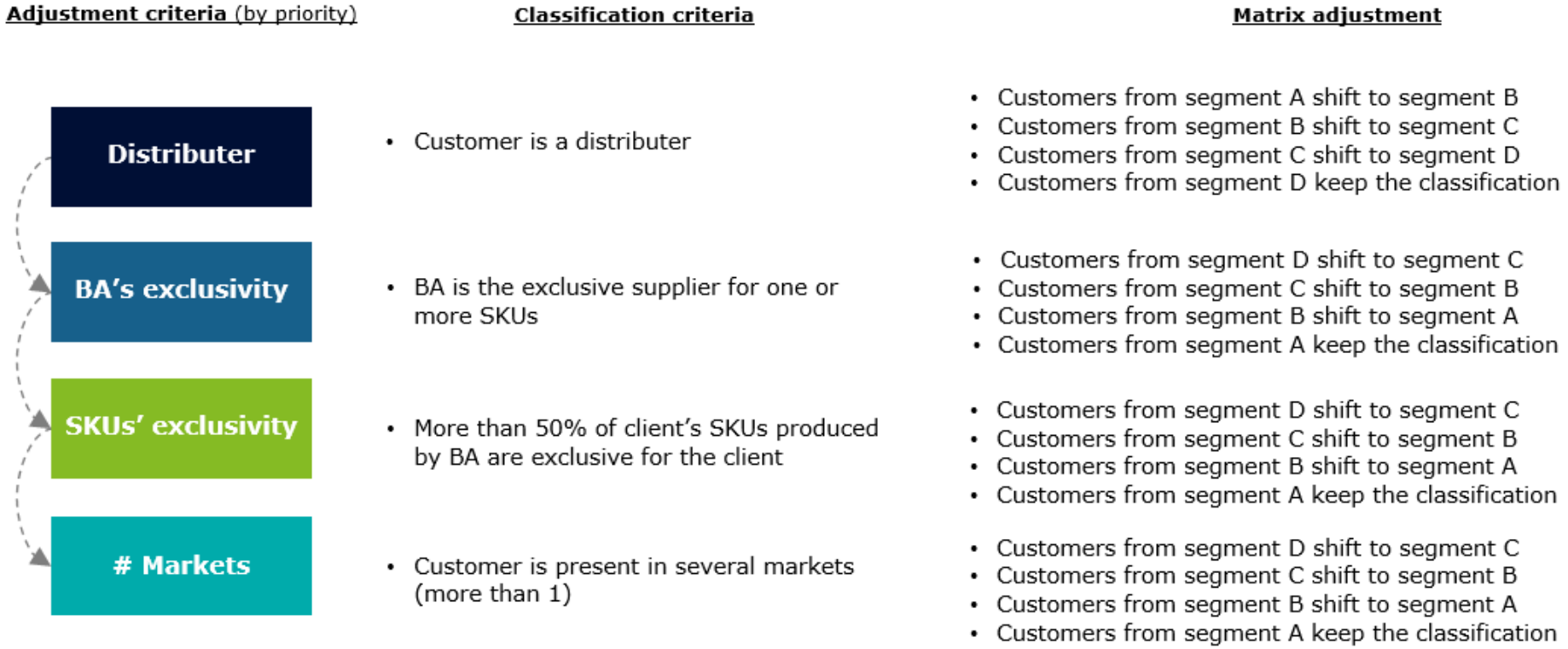

Figure 4.6: Manual adjustments process

In addition, in order to better understand how the segmentation process works, some examples are provided in Appendix D.

4.2.4 Characterization of the Customer Segments

According to the model built, all four customer segments will have very distinct characteristics, enabling the following definitions and descriptions:

- **Segment A**

Organized customers with high order volumes and frequency, and high growth potential, typically with integrated processes and systems, pre-agreed sales terms, and needs of specialized contact and best in class service levels.

What makes these customers interesting? They…

  - Last longer;
  - Always pay on time;
  - Are diversified;
  - Are stronger against retailers;
  - Lead innovation;
  - Are better managed;
  - Force the company to evolve;
  - Have larger quantities.

- **Segment B**

Organized customers with high order volumes and frequency, but low growth potential, with needs of personalized contact and reliable service levels.

This particular group of customers is characterized by:

  - Having local power;
  - Being good payers;
  - Having better prices;
  - Being more flexible;
  - Being well managed;
  - Being ambitious;
  - Having good quantities.

- **Segment C**

Organized customers with low order volumes and frequency, but high growth potential, with needs of personalized contact and reliable service levels.

These nice smaller customers are attractive because they…

  - Have local power;
  - Have some recognized and influential brands;
  - Have high flexibility;
  - Have great prices;
  - Add value to the company;
  - Are different and risky.

- **Segment D**

Less organized customers with low order volumes and frequency, and low growth potential, which can be treated in a standard and streamlined way, in order to reduce their cost-to-serve.

These customers, despite being last in the established hierarchy of the customer segments, are also appealing since they…

- Have the best prices and margins;
- Have high flexibility;
- Are open to buy several standard models;
- Push friends;
- Have local knowledge and influence.

4.3 Service Delivery Model Adjustment

As previously mentioned, the main purpose of the development of the present CS model is to adjust the service delivery model for each segment, in order to optimize the entire SOP by increasing the service level for the more valued customers and reducing the cost-to-serve for the less valuable ones.

It became, then, necessary to review the SOP, with more emphasis on the treatment and interaction with the clients, aiming to find improvement opportunities to address. A clear idea of which could be the privileges that the upper segments would be able to enjoy (e.g. specialized assistance, dedicated contact points, etc.) and, on the contrary, the restrictions that would have to be imposed to the customers in the lower segments (e.g. self-service channels, standard lead times, etc.), was the primary concern at this point.

The design of this future service model was made in deep cooperation with all the teams and departments involved in the project, alongside some orientation and guidance from several directors. Besides that, also an exhaustive benchmarking and analysis of the current leading practices were conducted along the way.

It was an extremely arduous and time-consuming process, as one would expect, given the numerous approaches and possibilities to consider and, for each one of them, the crucial study and assessment of its feasibility in the context of the company.

The resulting service models adjustments to be made, in each step of the SOP and for each customer segment, are now described.

- **Customer Service & Contact Points**

  This aspect covers the kind of treatment or attention each customer will be entitled to, including the handling of possible specific requests and the points of contact between the client and the company.

  Customers from segment A will have a multidisciplinary team available to assist them whenever necessary and prepared to meet their demands, in order to guarantee a constant high level of customer satisfaction, once these are the most valuable clients for BA. Additionally, they will have a hotline and dedicated mailbox, so that they can benefit from better response and resolution times.

  Segment B customers will have approximately similar privileges. In spite of not deserving a whole team, they will have a specialized assistant always available for them. Also, they will have a hotline and dedicated mailbox, ensuring better response and resolution times.

  Regarding segment C, customers will have a specialized assistant available too, as well as a dedicated mailbox. However, they will only have access to a generic line to get in touch with the company and, as a consequence, standard response and resolution times.

  Finally, D customers will only be able to contact the company through a generic mailbox, being attended by generic sales assistants and, thus, will have longer reaction times.

- **Negotiation**

The negotiation section focuses, mainly, on the pricing procedure and the payment terms to agree on.

Regarding the pricing process, customers that belong to segment A will profit from the support of an analytics team, from the Prices Department, prioritizing their price requests, aiming to reduce the approval time. In addition, they will have a higher margin in the agreement of the payment terms, being able to negotiate some discounts, mainly rappel, and higher credit limits.

For their part, customers in segment B will be entitled to negotiate possible discounts and special sales agreements and, also, it will be given priority in their requests, by the Prices Department, over the segments C and D, reducing their approval time.

C and D customers will be treated almost the same way. They will be given standard payment terms and lower credit limits, following BA's instructions and not having that much room for negotiation, other than occasional adjustments mostly for customers from the segment C. Besides, their price requests will be handled by the Prices Department, according to their availability and priority, and so, will have a standard approval time.

- **Order Management & Fulfillment**

This section involves the entire process of managing an order until its fulfilment, including possible special requests, late changes, etc.

As expected, A customers will benefit from the best lead times for order capture and deliver, being allowed to make last-minute changes, as long as they are reasonable and realistic. In these cases, BA is committed to make every possible efforts to make it happen. They will also be constantly informed about the order status, changes, stocks, and all the information that might be useful for them. In the future, BA aims to achieve a total integration with the customers' portals, through EDI for example, in order to optimize this interaction and make the information available in real time.

Similarly, customers classified as B will also be given preference, having better lead times and constant updates on the order status and any other valuable information. Regarding last-minute changes, they will be allowed to request them, however, they will be carefully analyzed and evaluated, being answered only if possible. In the future, BA aims to, also, achieve a total integration with these customers' portals, so that the interaction between the customer and the company is optimized.

On their turn, customers in the segment C will receive a common treatment, having standard lead times and only being able to make changes with a reasonable advance notice, so that BA has enough time to evaluate the situation and figure out the best alternative. These customers will be kept up to date on a periodic basis. The idea for these customers, in a near future, is to create an online portal for capturing orders and changes, so that they can be more autonomous and, this way, save time and resources to BA.

Finally, D customers will be offered standard lead times, being, though, below all others in terms of priority. They will only be allowed to make any kind of changes well in advance and, even then, those changes will have to be evaluated and their acceptance is not assured. Besides that, these customers will not be contacted nor updated, except upon request or when strictly necessary. Also, just like the ones from the segment C, BA wants to make these customers independent and autonomous in the future.

- **Invoicing**

Lastly, this part includes the process of managing invoices and possible claims.

In this case, customers in the segments A and B will be treated almost in the same way, with the exception that, whenever they are coincident, priority will be given to the A

customers, of course. They will be provided with the best deductions and claims resolution times, on top of being always up to date through the exchange of invoice and credit or debit memos at any time needed. The invoicing process will, also, be optimized in the future, upon the integration of the customers' portals, if the company manages to achieve that goal.

The situation is similar for customers in the segments C and D, both will be offered the standard deductions and claims resolution times, being that C customers will be prioritized over the D ones. Regarding the report of information, these customers will be updated periodically or upon request. The future online portal, when, and if, built, is also aimed to include invoice distribution and claims management, optimizing these processes.

These adjustments to BA's service delivery model, according to the customer segment, are summarized in Figure 4.7.

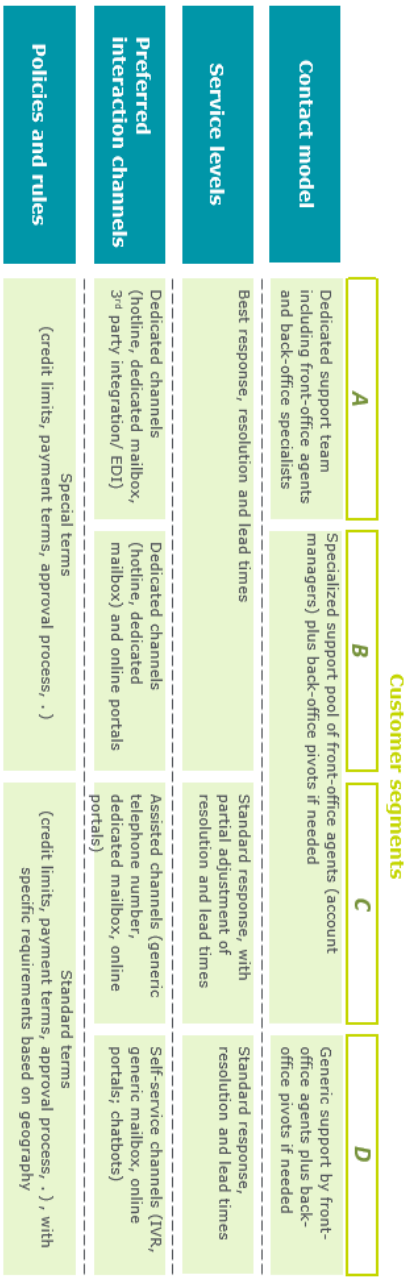

Figure 4.7: Service delivery model adjustments

5 Results & Analysis

After the definition of the CS model, a database was constructed, using Microsoft Excel, and prepared to receive all the necessary data about the customers and be capable of classifying and distributing them across the delineated segments.

This database, and its results, are more detailed in Appendix E.

However, before presenting them, and in order to ensure the capability of the model developed and validate the conclusions to be drawn, some statistical analyses were performed on the results obtained. If necessary, some minor changes could still be made during this assessment. The statistical analysis software IBM SPSS Statistics was the one chosen to carry out these procedures.

A summary of the results of each variable, also obtained through this software, are presented in Appendix F.

Following that step, being the CS model completely closed, finally, the segmentation results are presented.

5.1 Statistical Analyses

5.1.1 Customer Segments

First of all, it was decided to inspect the number of customer segments.

For BA, it did not make any sense to have a larger number of segments, because that would only increase the complexity degree of the segmentation and, also, would make the process of adjusting the service model accordingly even more difficult. However, lowering it too much did not make sense either, since, even though decreasing the complexity of the model, it would compromise the quality of the differentiation of the customers and, consequently, the segmentation.

Thus, the only alternative to the current scenario that would be worth to consider was to use three. Setting the number of segments to three could possibly reduce the complexity of the service model adjustment without jeopardizing the capacity of the CS model, significantly at least. For that reason, it was decided to investigate which of the scenarios was the most appropriate for BA's database.

A cluster analysis was, then, performed. As stated by Miguéis et al. (2012), clustering is a widely used data mining technique that maps data items into unknown groups of items with high similarity (i.e., clusters). So, every cluster should be composed of data similar to each other and different from the data present in the remaining ones.

Currently, there are numerous relatively famous clustering algorithms, being a considerable variety of them available in SPSS software. In this case, the TwoStep Cluster Analysis, created by the company itself, was the one adopted.

Unlike most clustering methods, that do not address the issue of determining the number of clusters, because the means of achieving it is difficult and it is considered a separate issue, the TwoStep Cluster Analysis provides the capability to automatically find the optimal number of clusters. In addition, it is capable of handling both continuous and categorical variables and, not only the process of running a simulation works remarkably well and fast, but also the results gathered are consistently accurate.

So, this method was applied to the data in question and, as an input, it was established that three and four were, respectively, the lower and upper limit for the number of customer segments.

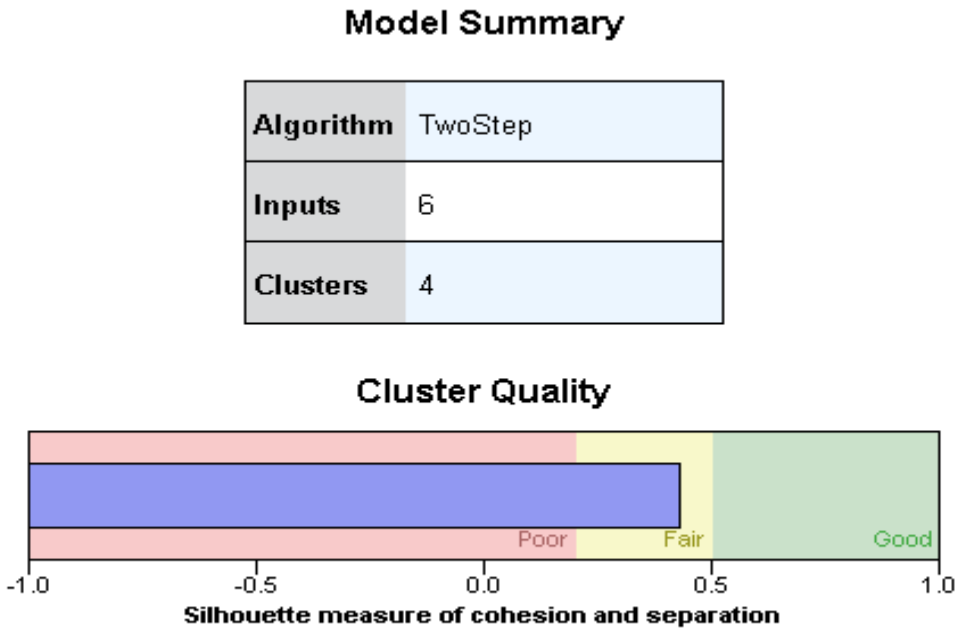

Figure 5.1: Results of the TwoStep Cluster Analysis

As can be seen in Figure 5.1, where the obtained results are summarized, four clusters were found based on the six input variables selected. The cluster quality, a measure of the homogeneity of the values within each group and heterogeneity in relation to the others, was graded as fair. Taking into account the restrictions previously established, this value was perfectly acceptable and, ergo, the initial model was maintained.

A more detailed vision of this analysis' results, name the composition of the segments found, are displayed in Appendix G.

5.1.2 Segmentation Criteria

Furthermore, it was also decided to validate the significance of the segmentation criteria being used, in order to evaluate the influence each variable has on the final results and, thereby, if it is meaningful and logical to keep every single one of them in the CS model.

With this purpose, a correlation test, which measures the strength and direction of association between two variables, was operated. The correlation coefficient varies between one and minus one, values that point out a perfect degree of association between the variables, being that the plus sign indicates a positive relationship and the minus sign a negative one (StatisticsSolutions, 2018).

In statistics, there are several famous types of correlation analyses. The one chosen for this study was the Spearman Correlation.

The Spearman Correlation is a nonparametric test, not requiring the variables to be tested to follow a normal distribution and, as a consequence, it is appropriate to both continuous and discrete ordinal variables. This way, this method seemed quite adequate to analyze the data in question.

Nevertheless, the data still had to be treated and prepared in order to fit the test requirements and specifications. Hence, the following adjustments were made:

- The three variables that constitute the Growth Potential criteria were all compiled into only one binomial variable, being that 1 means "high growth potential" and 0 equals "low growth potential";
- The classification of the segments was changed from letters to numbers, being that A equals 4, B equals 3, C equals 2, and D equals 1.

Finished this changes, the test was performed. It was tested the null hypothesis, H_0, that there was no correlation between each one of the variables and the final result, against the alternative hypothesis, H_1, that that correlation exists. Let ρ_s be the Spearman's correlation coefficient, then this test can be expressed as:

$$H_0 : \rho_s = 0$$

$$H_1 : \rho_s \neq 0$$

The results obtained are synthesized in Table 5.1.

Table 5.1: Results of the Spearman Correlation test

Correlations

		Final_Evaluation	Sales_Revenue	Growth_Potential	Dealer	BA_Exclusivity	SKU_Exclusivity	N_Markets
Spearman's rho Final_Evaluation	Correlation Coefficient	1,000	.351**	.359**	-.481**	.374**	.408**	.260**
	Sig. (2-tailed)		0,000	0,000	0,000	0,000	0,000	0,000
	N	703	703	703	703	703	703	703

**. Correlation is significant at the 0.01 level (2-tailed).

Examining the outcome of the Spearman Correlation test, namely the correlation coefficients, it was evident that customer segment definition, present in the "Final_Evaluation" field, was significantly associated and dependent on every one of the variables included in the CS model built. The Spearman's correlation coefficients were all significant and, additionally, also the p-values were, with no exception, lower than the defined critical level of 0,01. This proves the relevance of every criteria and so, they were all maintained and, once again, no changes were made to the model.

More detailed results are available in Appendix H.

5.2 Segmentation Results

After the development and application of this CS model, a lot of information regarding the customers can be extracted from the obtained results, allowing the company a deeper knowledge about its clients and, consequently, a much better understanding of their characteristics and needs. These results are presented next. As already noted above, these results are shown, in more detail, in Appendix E.

Firstly, being one of the most important aspects, the number of customers assigned to each of the four segments was analyzed.

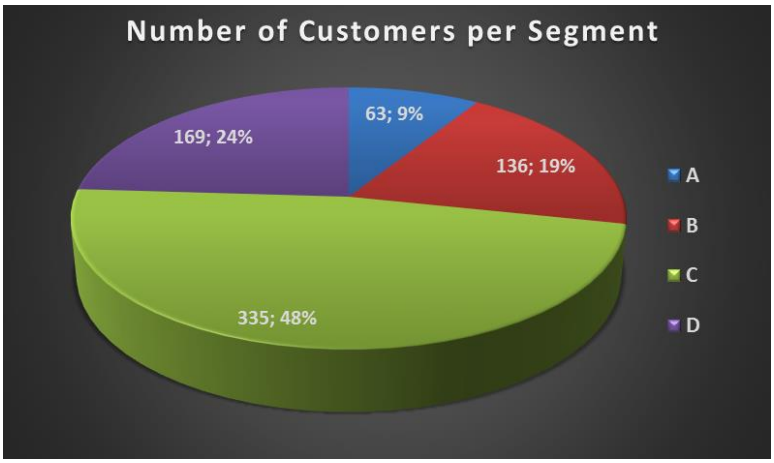

Figure 5.2: Number of customers per segment

In this analysis, as previously mentioned, the main target is to determine and control the number of customers in the higher segments, especially in segment A. These are the customers in which BA will strongly invest on, being willing to make great efforts to maximize its service levels. This fact implies that they will also be the ones with significantly higher cost to serve, representing a very large share of all the customer related costs, and, therefore, their number has to be cautiously monitored and managed taking into account the reality and possibilities of the company.

As it can be easily seen in Figure 5.2, there are 63 customers classified as A, which translates into around 9% of the total number of customers examined. Regarding segment B, it contains 136 clients at the moment, which represents about 19% of the total. These values are in conformity with the initial ideas of the stakeholders, namely the A segment under 10% of the total. However, only time and experience will confirm, with certainty, if these numbers are appropriate for this context and, of course, BA. In case it is necessary to change them, one has only to adjust the reference values present in the segmentation model according to the new pretensions. The model was already built taking that into account, updating automatically when these values are changed (Figure 5.3).

Quick Scenarios	Minimum value for High/Low Revenue Differentiator:	2 000 000 €
	Share of Wallet Differentiator:	50%
Advanced	Minimum weight of exclusive products on client's portfolio:	50%
	Minimum number of markets the client is present in:	1

NOTE: After changing the scenario, click "Refresh All" on the tab "Data" above, or press Ctrl+Alt+F5.

Figure 5.3: Quick scenarios available on the segmentation model

Next, the sales of every customer segment, both in revenue and in units, were calculated and compared, with the purpose of measuring the relevance of each one of them. Of course, this is not the only important factor in that measure, but already gives some indications and general ideas.

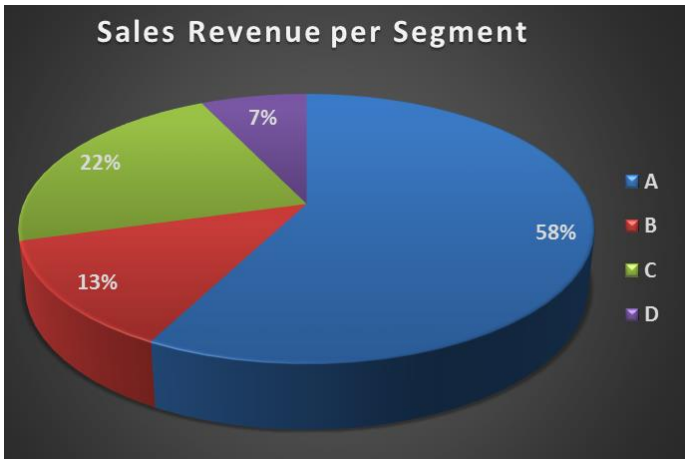

Figure 5.4: Sales revenue per segment

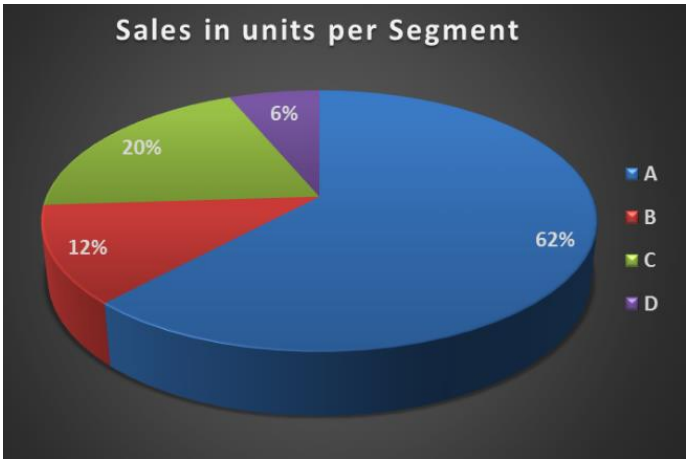

Figure 5.5: Sales in units per segment

Looking at Figures 5.4 and 5.5, the major relative importance of the A customers is unequivocal and undeniable, as expected. In this respect, segment A completely stands out from the others. This segment, which, as reported above, accounts for only 9% of the customer under review, at the same time, corresponds to approximately 60% of the company's total sales during the last year.

Next, the growth potential within each segment was investigated. For that, it was used not only the growth potential criteria, already treated and prepared for the previous statistical analyses carried out, but also the share of wallet variable itself, independently. The results are displayed in Figures 5.6 and 5.7.

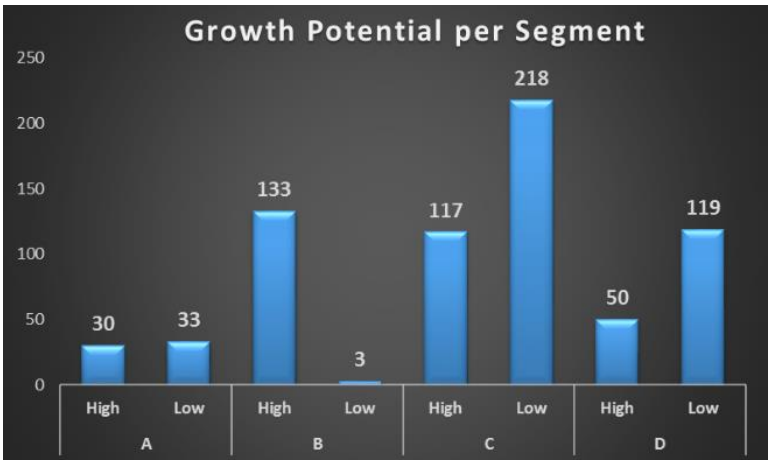

Figure 5.6: Growth potential per segment

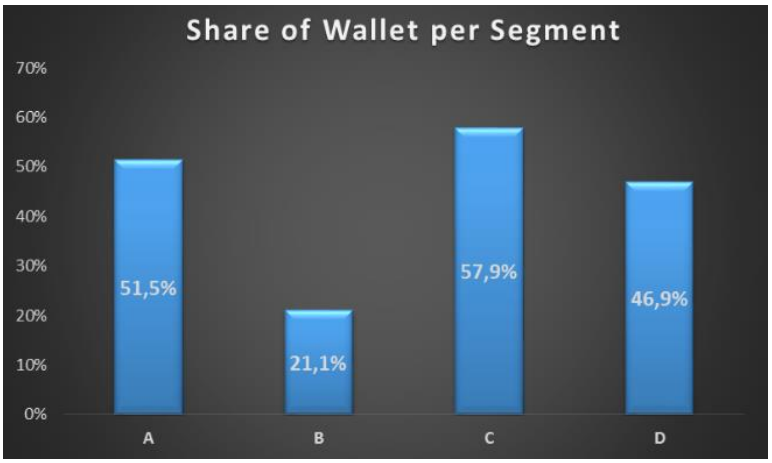

Figure 5.7: Share of wallet per segment

Through the interpretation of these figures, it is possible to conclude there is a large growth margin within the customers from segment B, with represents an improvement opportunity that should be evaluated by the company. Besides, as A customers are the most valuable ones, even though it is harder, there is still some room for growth, so BA should also study the possibility of designing a strategy to address this issue.

Posteriorly, the manual adjustment criteria were analyzed, in order to assess the complexity of each customer segment. Furthermore, the overall effect of these criteria on the final results was measured as well.

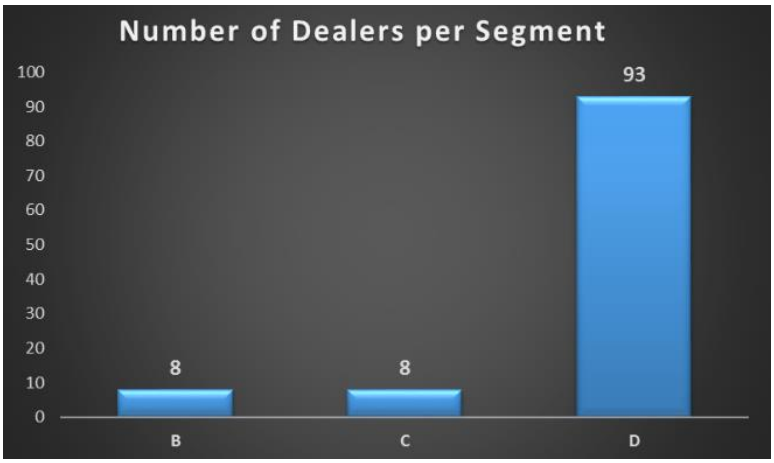

Figure 5.8: Number of dealers per segment

Figure 5.9: Number of customer to whom BA is the exclusive supplier for one or more SKUs

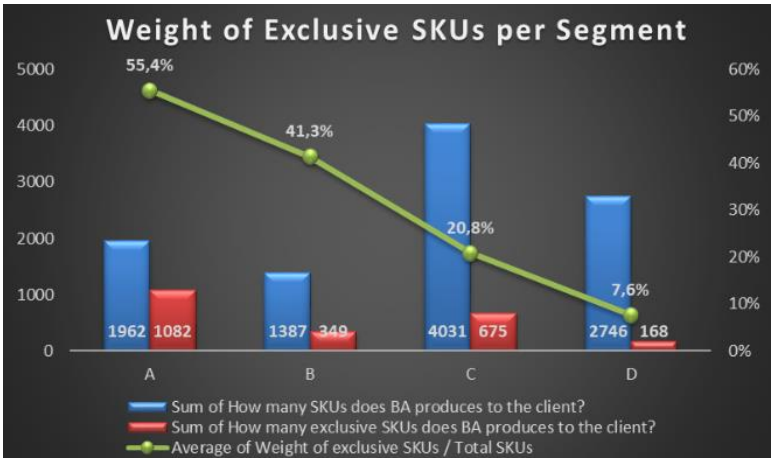

Figure 5.10: Weight of exclusive SKUs per segment

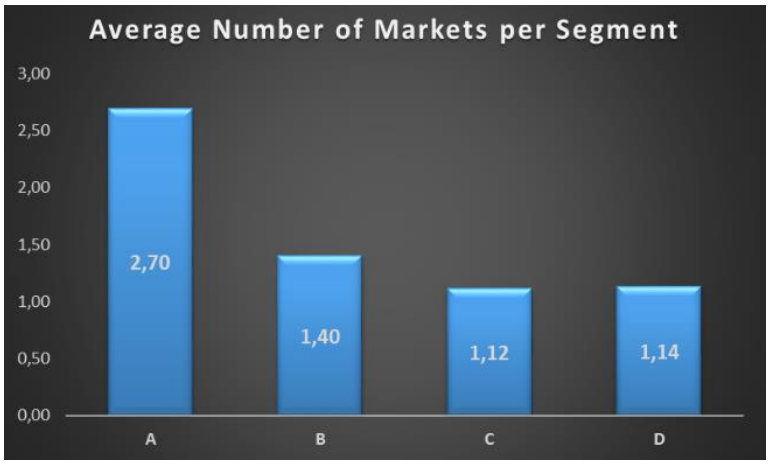

Figure 5.11: Average number of markets per segment

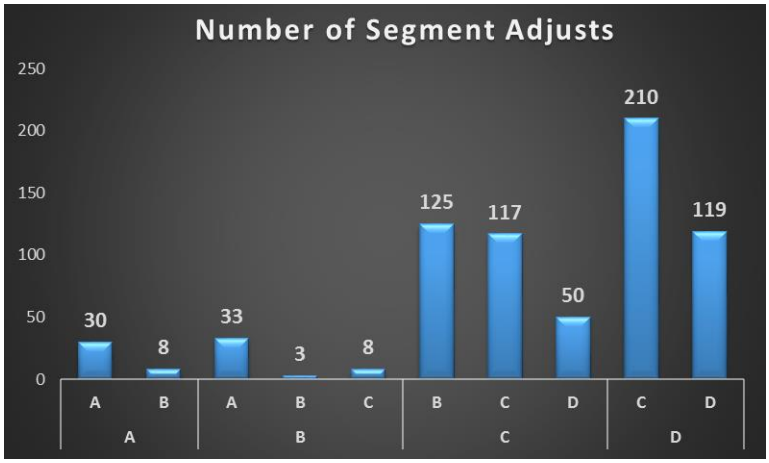

Figure 5.12: Number of segment adjusts

The number of dealers per segment, shown in Figure 5.8, seems perfectly reasonable. In the future, surely it will be intended to eliminate the dealers of segment B, at least. Nonetheless, the company currently needs them, because they are strategic clients, in strategic markets.

Figure 5.9 reveals the number of customers, per segment, to whom BA is the exclusive supplier for, at least, one product. These are not so satisfactory, especially with regard to segments A and C. On the one hand, this value is too high for segment C. In BA's context, being the sole supplier of any product significantly increases the complexity of the customer

and the company's responsibility towards it. On the other hand, concerning segment A, maybe this value should be enlarged, because it is a sign of a high level of trust and commitment between the company and the clients.

On their turn, Figures 5.10 and 5.11 present the average weight of the exclusive products among all the ones bought by each customer and the average number of markets or countries where BA has to deliver products for each customer, respectively. The two, of course, divided by segment. Both figures exhibit normal results, being possible to clearly visualize the decrease of the level of complexity of the clients as one descends along the hierarchy of the customer segments, just like it is supposed to be.

Regarding the general influence of the manual adjustment criteria on the results, it can inferred through the examination of Figure 5.12. Only a mention to the large number of adjustments from segments D to C and C to B, which were quite predictable, though.

Last, but not least, profit, margin and cost analyses, per segment, were carefully conducted. These analysis do not need any presentation or justification, being extremely important in any business, as they are absolutely key factors for the success and prosperity of every single company.

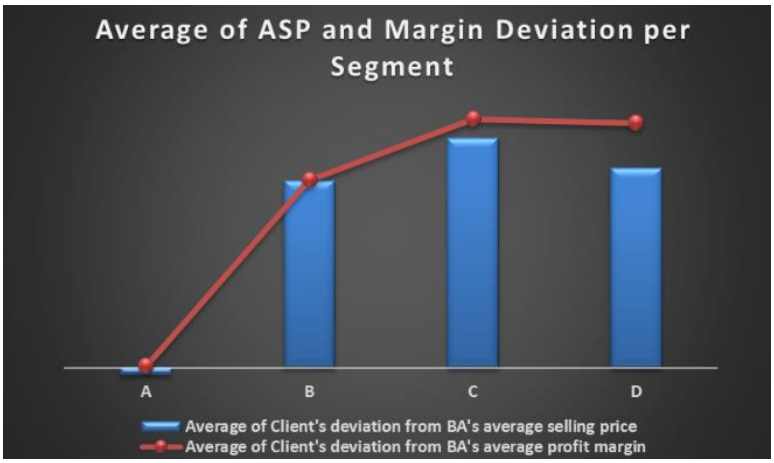

Figure 5.13: Average of the average sales price and profit margin deviation per segment

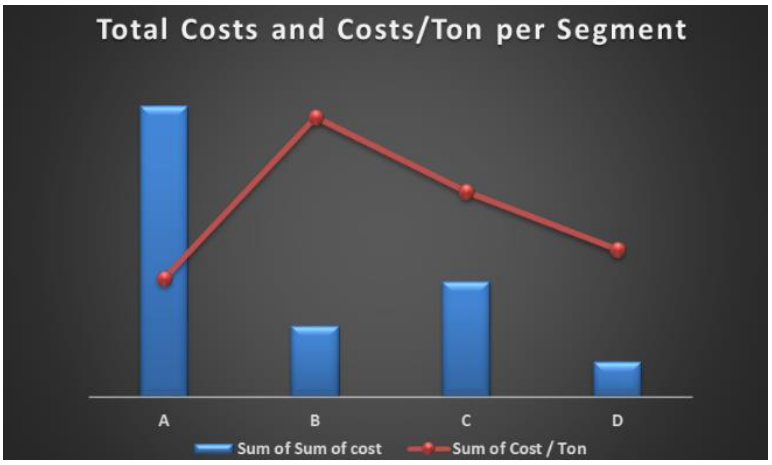

Figure 5.14: Total costs and costs per ton by segment

Figure 5.13 presents the deviation of the average sales price and profit margin of each one of the customer segments comparing to the BA global ones. The results are within the foreseen limits, but, especially with regard to segment A, they have to be much better, and so, greatly improved. It was already expected that these values were lower in the A customers, because they bring other kinds of benefits for BA, like the expansion into new markets and the

promotion of the company and its work. Still, the values are too low and it is definitely an issue that must be taken into account in the near future.

For its part, Figure 5.14 displays the total costs and the average cost per ton in each of the four segments. Here, the key indicator is the latter, with total costs being a kind of secondary information. As it can be clearly seen, segment A is the one with the lowest average costs per ton. This result can be explained by the fact that A customers are larger companies, with high volumes of purchases, representing lower costs for BA, since the efficiency of the production is directly proportional to the quantity produced. Nevertheless, in a perspective of continuous improvement, BA must always work hard towards the optimization of all processes related to the production and delivery of its products, with the purpose of reducing the associated costs, regardless of the customer segment.

In addition, the customer's segments were analyzed individually, with the purpose of characterizing them in a more precise and specific way. The results obtained are presented in Appendix I.

6 Conclusions and Future Work

To conclude the present report, this last chapter presents not only the major conclusions and lessons learned by doing this project, but also some prospects for possible work and researches in the future.

6.1 Conclusions

First, and most important of all, the main goal proposed at the beginning of this project was achieved. Now, BA has a customer segmentation model that allows the company to optimize the sales ordering process, among others, by enabling the adoption of specific strategies and service model adjustments for each customer segment, aiming to increase the satisfaction level of the most valuable customers and reduce the cost to serve the less relevant ones.

Through the results obtained, it was possible to clearly distinguish and group the clients. Here, segment A, as expected, proved to be notoriously more valuable and important to the company. This is incontestably demonstrated by the fact that this segment, accounting for only 9% of the total number of active customers, represents approximately 60% of the total sales revenue of the whole BA Group. This evidence undoubtedly attests the meaning and relevance of the development of the present segmentation model and the inherent prioritization and focus on the most valuable customers.

After successfully testing it with the customers who had significant sales revenues last year, the model was implemented in the process of new customer creation and, therefore, new clients are classified from the very beginning. In addition, also a database with the model was added to the company's customer databases, prepared to be automatically updated every year upon the insert of the previous year's sales, in order to keep customers classification up to date and evaluate their evolution along the years.

This project has undoubtedly contributed to the education and development of the author, not only professionally but also personally. It was extremely motivating to work on one of the most important projects in the company nowadays and it will be an enormous pleasure to see its implementation being consolidated throughout all BA Group and check the benefits it will bring to the company.

6.2 Prospects for Future Work

6.2.1 The Company

Regarding BA, the implementation of this customer segmentation strategy should not be an end, but only a meaningful step towards the ultimate goal of fully implementing a Customer Relationship Management system in the company.

Even though it is a long and arduous process, requiring a lot of changes in the organization of the company, it will represent a great advance and improvement for BA. As the company

grows, in terms of sales, customers, geographies, for instance, its own structure also has to evolve, in order to be able to follow and support this growth, by continuously optimizing the added value and outcomes of every employee, department and, as a consequence, the company as a whole.

Technology will, for sure, play an essential role as an enabler for process optimization. Tools that manage all interactions with the clients along the entire customer lifecycle, platforms that allow information centralization and display, providing an integrated view of customer information and being seen as a single source of truth, and web based portals that support multiple order to cash processes, working as an interface and interaction point with the clients, are some of the relevant trend emerging nowadays.

Thus, a posture of continuous improvement is absolutely crucial for BA to continue growing in a sustainable way, and so, the company must constantly seek improvement opportunities and have the courage to take risks and make changes.

6.2.2 The Concept

With respect to customer segmentation, it was found that the current state of the art is somewhat precarious and there still is a long way to go until the achievement of a universally common understanding of this concept.

There is a clear lack of options regarding the existing segmentation models, being that most of them are too simple and do not give good enough results considering the enormous amount of data and information the companies have available at the moment. From a data mining perspective, the segmentation methods still have a lot of limitations like not processing categorical data and not being able to deal with variables not equally important to the model in question, for example. Also, deciding the optimal number of segments is known to be a very difficult task and there are still few heuristic approaches to solve this problem.

There is a huge demand, at the moment, by companies that desperately desire applications and solutions capable of transforming data overload into critical information they need to make faster and smarter decisions. So, taking into account the current existing challenges and consequent limitations, further research is unquestionably necessary in this area.

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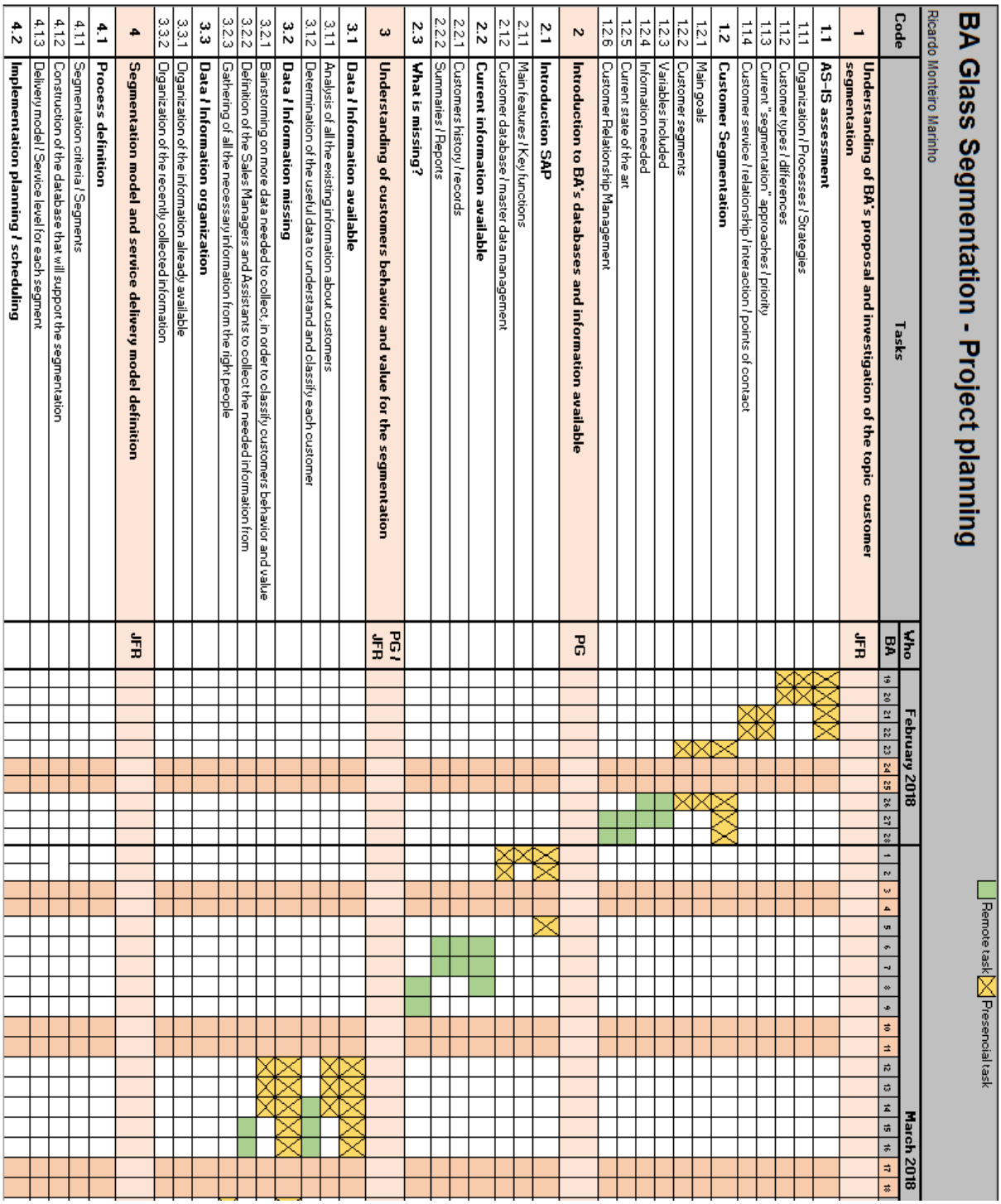
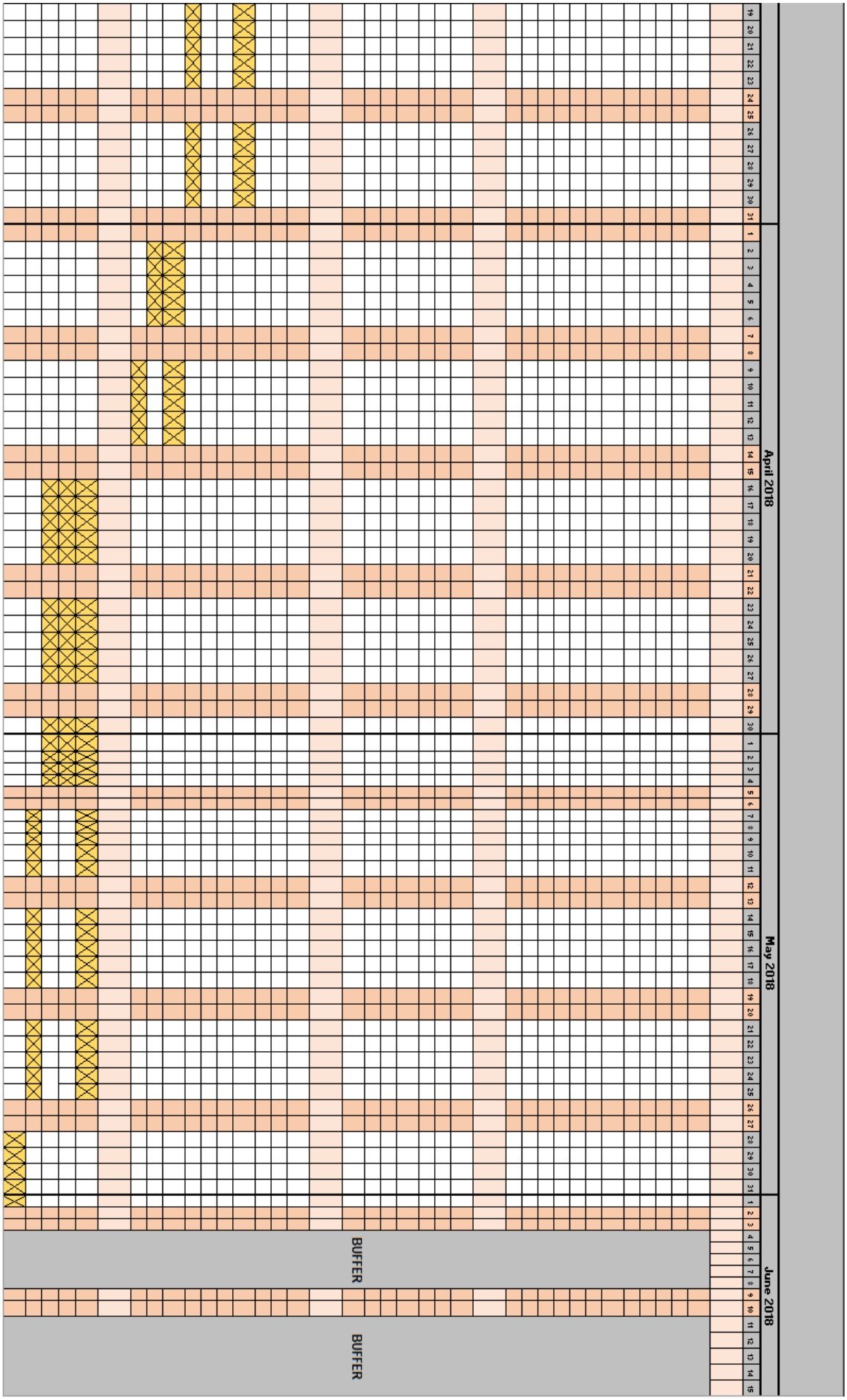
APPENDIX A: Project Planning

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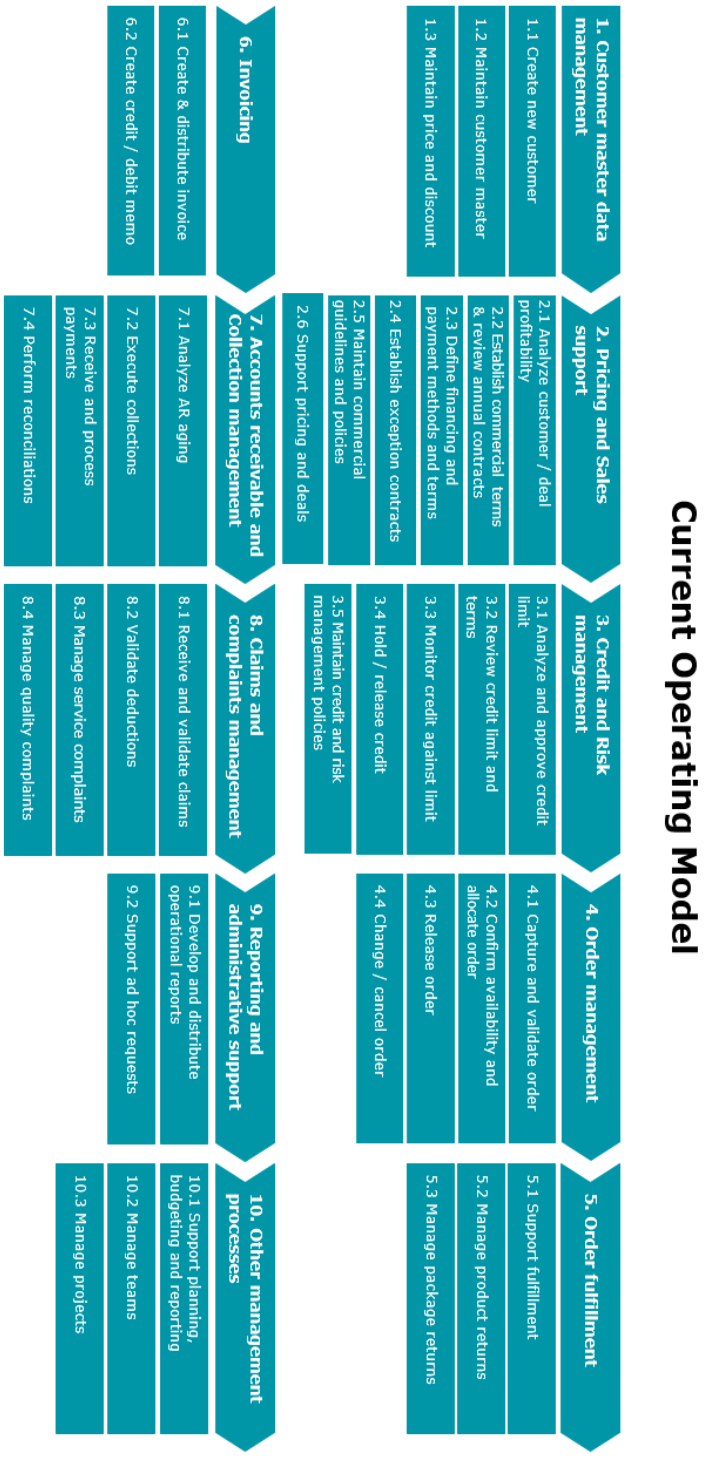
APPENDIX B: BA's Order-to-Cash Cycle



APPENDIX C: Customer Selection Process

Customer	Quantity				Value		%
Name	(1000)	%	Tons	%	EUROS	%	YTD
Customer 1	692 377	8,31%	155 470	7,60%	57 128 221	7,06%	7,06%
Customer 2	537 108	6,45%	90 839	4,44%	38 561 483	4,77%	11,83%
Customer 3	101 683	1,22%	45 552	2,23%	19 755 676	2,44%	14,28%
Customer 4	166 552	2,00%	52 995	2,59%	18 952 239	2,34%	16,62%
Customer 5	249 583	3,00%	46 217	2,26%	17 950 225	2,22%	18,84%
Customer 6	194 161	2,33%	40 341	1,97%	15 582 858	1,93%	20,77%
Customer 7	188 577	2,26%	38 492	1,88%	15 554 586	1,92%	22,69%
Customer 8	177 010	2,13%	35 637	1,74%	15 523 199	1,92%	24,61%
Customer 9	104 793	1,26%	40 637	1,99%	14 775 835	1,83%	26,44%
Customer 10	121 513	1,46%	23 203	1,13%	14 151 592	1,75%	28,19%
Customer 11	151 610	1,82%	41 542	2,03%	14 071 358	1,74%	29,93%
Customer 12	99 834	1,20%	32 816	1,60%	12 193 054	1,51%	31,43%
Customer 13	89 124	1,07%	33 494	1,64%	11 363 075	1,41%	32,84%
Customer 14	49 481	0,59%	29 895	1,46%	9 820 358	1,21%	34,05%
Customer 15	156 762	1,88%	20 606	1,01%	9 497 748	1,17%	35,23%
Customer 16	45 280	0,54%	22 382	1,09%	9 248 925	1,14%	36,37%
Customer 17	211 088	2,53%	18 602	0,91%	9 070 248	1,12%	37,49%
Customer 18	67 876	0,81%	21 909	1,07%	8 620 808	1,07%	38,56%
Customer 19	54 999	0,66%	19 622	0,96%	8 518 524	1,05%	39,61%
Customer 20	72 002	0,86%	18 368	0,90%	8 444 867	1,04%	40,66%
Customer 21	98 447	1,18%	22 180	1,08%	8 359 900	1,03%	41,69%
Customer 22	55 575	0,67%	26 316	1,29%	8 090 735	1,00%	42,69%
Customer 23	130 211	1,56%	25 186	1,23%	7 561 127	0,93%	43,63%
Customer 24	116 260	1,40%	18 530	0,91%	6 492 394	0,80%	44,43%
Customer 25	97 066	1,17%	15 801	0,77%	6 402 333	0,79%	45,22%
Customer 26	38 560	0,46%	16 805	0,82%	6 296 419	0,78%	46,00%
Customer 27	62 648	0,75%	17 382	0,85%	6 254 279	0,77%	46,77%
Customer 28	99 211	1,19%	13 386	0,65%	6 071 995	0,75%	47,52%
Customer 29	62 306	0,75%	12 877	0,63%	6 045 700	0,75%	48,27%
Customer 30	45 055	0,54%	12 531	0,61%	5 912 841	0,73%	49,00%
Customer 31	66 225	0,80%	15 636	0,76%	5 274 444	0,65%	49,65%
Customer 32	90 052	1,08%	13 484	0,66%	5 142 232	0,64%	50,29%
Customer 33	31 315	0,38%	14 777	0,72%	5 013 190	0,62%	50,91%
Customer 34	74 862	0,90%	10 991	0,54%	4 925 271	0,61%	51,52%
Customer 35	53 809	0,65%	13 659	0,67%	4 914 993	0,61%	52,13%

...	...	...	...	...	...	...	...
Customer 656	203	0,00%	86	0,00%	34 742	0,00%	99,34%
Customer 657	365	0,00%	53	0,00%	34 444	0,00%	99,35%
Customer 658	494	0,01%	66	0,00%	34 409	0,00%	99,35%
Customer 659	208	0,00%	95	0,00%	34 393	0,00%	99,35%
Customer 660	303	0,00%	65	0,00%	34 267	0,00%	99,36%
Customer 661	181	0,00%	82	0,00%	33 989	0,00%	99,36%
Customer 662	137	0,00%	76	0,00%	33 458	0,00%	99,37%
Customer 663	147	0,00%	73	0,00%	33 295	0,00%	99,37%
Customer 664	191	0,00%	85	0,00%	33 140	0,00%	99,37%
Customer 665	440	0,01%	57	0,00%	33 035	0,00%	99,38%
Customer 666	220	0,00%	42	0,00%	32 982	0,00%	99,38%
Customer 667	131	0,00%	57	0,00%	32 923	0,00%	99,39%
Customer 668	257	0,00%	39	0,00%	32 800	0,00%	99,39%
Customer 669	200	0,00%	87	0,00%	32 670	0,00%	99,39%
Customer 670	329	0,00%	56	0,00%	32 575	0,00%	99,40%
Customer 671	313	0,00%	97	0,00%	32 541	0,00%	99,40%
Customer 672	192	0,00%	65	0,00%	32 190	0,00%	99,41%
Customer 673	282	0,00%	87	0,00%	31 973	0,00%	99,41%
Customer 674	187	0,00%	83	0,00%	31 791	0,00%	99,41%
Customer 675	245	0,00%	78	0,00%	31 616	0,00%	99,42%
Customer 676	95	0,00%	55	0,00%	31 524	0,00%	99,42%
Customer 677	242	0,00%	38	0,00%	31 421	0,00%	99,43%
Customer 678	102	0,00%	65	0,00%	31 164	0,00%	99,43%
Customer 679	184	0,00%	77	0,00%	31 072	0,00%	99,43%
Customer 680	184	0,00%	75	0,00%	30 974	0,00%	99,44%
Customer 681	163	0,00%	72	0,00%	30 937	0,00%	99,44%
Customer 682	161	0,00%	55	0,00%	30 813	0,00%	99,45%
Customer 683	279	0,00%	64	0,00%	30 598	0,00%	99,45%
Customer 684	225	0,00%	99	0,00%	30 491	0,00%	99,45%
Customer 685	160	0,00%	79	0,00%	30 435	0,00%	99,46%
Customer 686	225	0,00%	54	0,00%	30 247	0,00%	99,46%
Customer 687	258	0,00%	34	0,00%	30 159	0,00%	99,46%
Customer 688	245	0,00%	68	0,00%	30 154	0,00%	99,47%
Customer 689	428	0,01%	94	0,00%	29 896	0,00%	99,47%
Customer 690	114	0,00%	65	0,00%	29 773	0,00%	99,48%
Customer 691	113	0,00%	62	0,00%	29 677	0,00%	99,48%
Customer 692	311	0,00%	58	0,00%	29 387	0,00%	99,48%
Customer 693	144	0,00%	67	0,00%	29 183	0,00%	99,49%
Customer 694	265	0,00%	76	0,00%	29 142	0,00%	99,49%
Customer 695	111	0,00%	66	0,00%	29 074	0,00%	99,49%
Customer 696	129	0,00%	56	0,00%	28 144	0,00%	99,50%
Customer 697	146	0,00%	71	0,00%	27 810	0,00%	99,50%
Customer 698	481	0,01%	82	0,00%	27 722	0,00%	99,50%
Remaining customers	31 614	0,38%	8 669	0,42%	4 011 382	0,50%	100,00%
Total	**8 328 864**	**100,00%**	**2 045 134**	**100,00%**	**808 696 460**	**100,00%**	

APPENDIX D: Segmentation Process - Examples

Customer 1

- **Sales revenue = 9.1M €**
- Customer buys the remaining product portfolio **to more than 1 supplier**
- SKUs being bought to other suppliers **are within BA's current portfolio**
- **80% of estimated share of wallet** of BA products within customer's portfolio

- BA is the **exclusive supplier** for some of client's SKUs
- **# of exclusive SKUs** produced for the client = 57 (***51%*** *of SKUs sold are exclusively produced for the client)*
- **# of markets** where BA delivers products = **1**

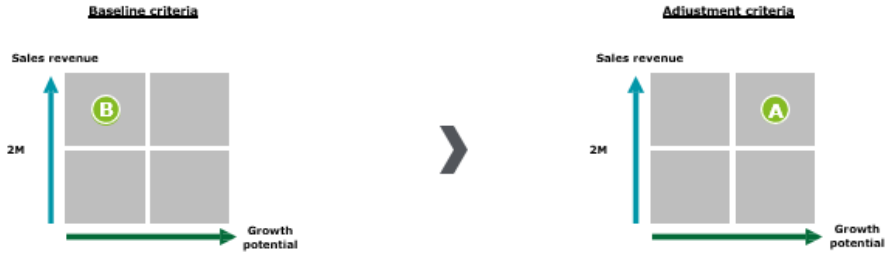


Figure 6.1: Example 1

Customer 2

- **Sales revenue = 4.7M €**
- Customer buys the remaining product portfolio **to more than 1 supplier**
- SKUs being bought to other suppliers **are within BA's current portfolio**
- **60% of estimated share of wallet** of BA products within customer's portfolio

- Customer is a **product dealer**
- BA is **not the exclusive supplier** for any of client's SKUs
- **# of exclusive SKUs** produced for the client = 1 (***0,5%*** *of SKUs sold are exclusively produced for the client)*
- **# of markets** where BA delivers products = **1**

Figure 6.2: Example 2

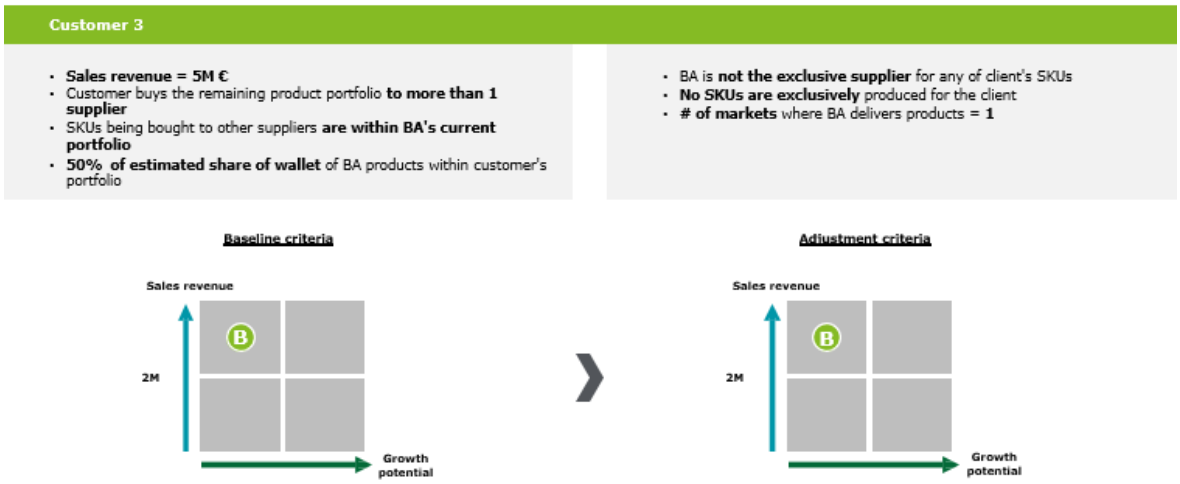


Figure 6.3: Example 3

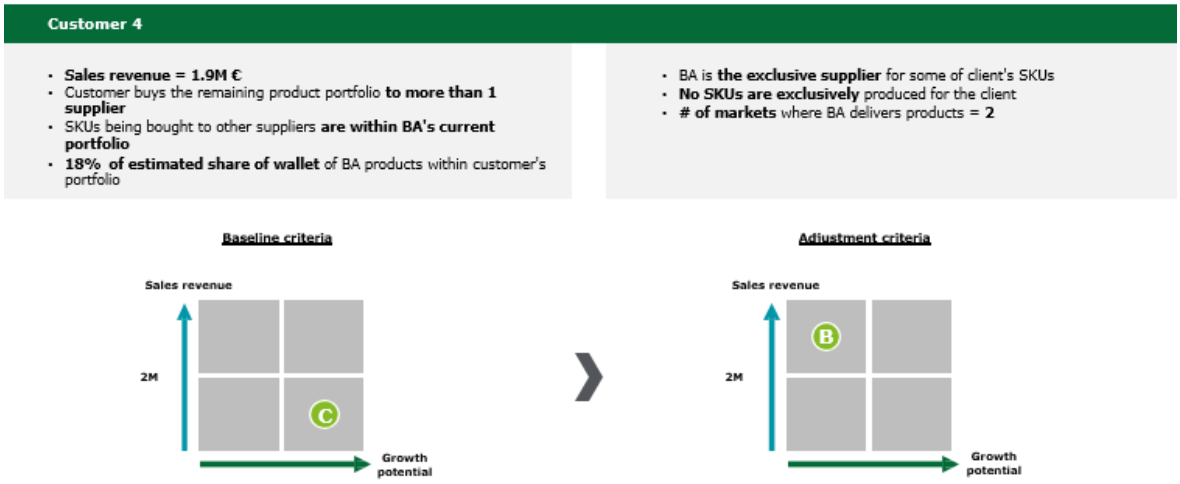


Figure 6.4: Example 4

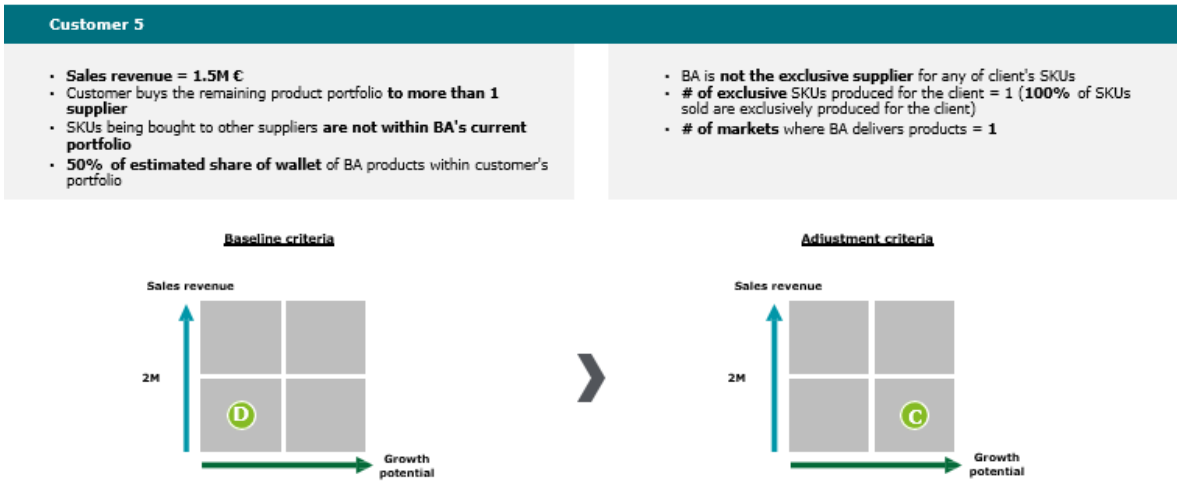
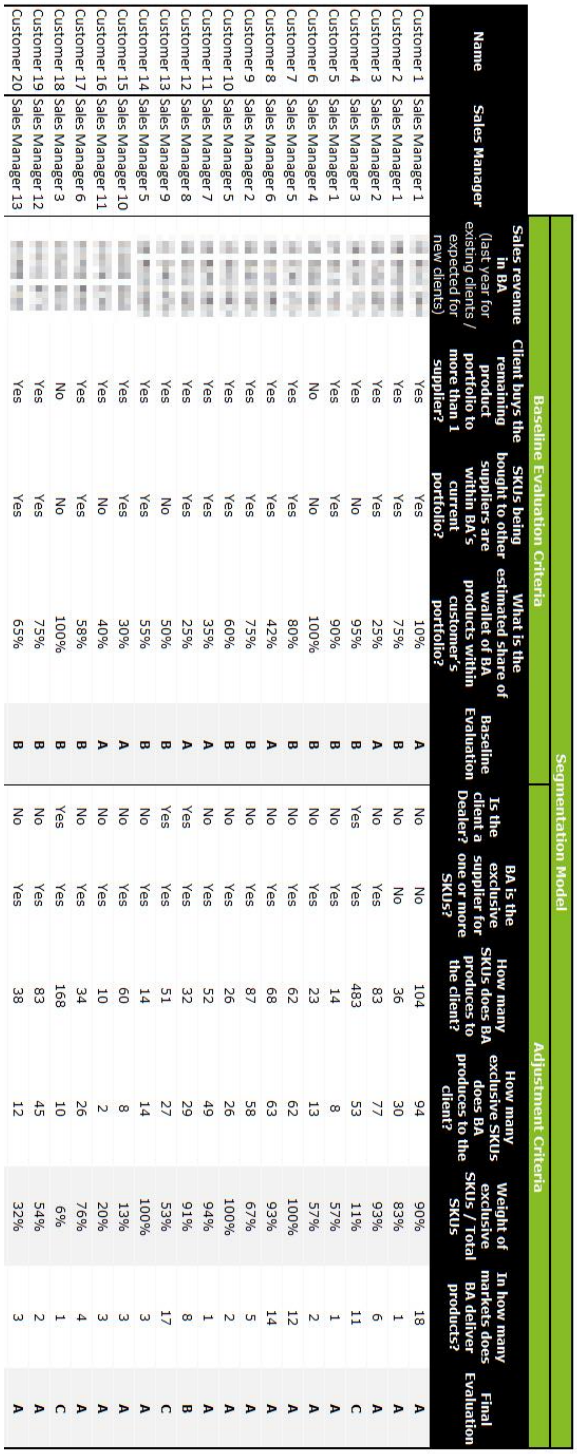


Figure 6.5: Example 5

APPENDIX E: Segmentation Database & Results

- **Top 20 Customers**



Name	Sales Manager	Baseline Evaluation Criteria: Sales revenue in BA (last year for existing clients / expected for new clients)	Client buys the remaining product portfolio to more than 1 supplier?	SKUs being bought to other suppliers are within BA's current portfolio?	What is the estimated share of wallet of BA products within customer's portfolio?	Baseline Evaluation	Segmentation Model: Is the client a Dealer?	BA is the exclusive supplier for one or more SKUs?	Adjustment Criteria: How many SKUs does BA produces to the client?	How many exclusive SKUs does BA produces to the client?	Weight of exclusive SKUs / Total SKUs	In how many markets does BA deliver products?	Final Evaluation
Customer 1	Sales Manager 1		Yes	Yes	10%	A	No	No	104	94	90%	18	A
Customer 2	Sales Manager 1		Yes	Yes	75%	B	No	No	36	30	83%	1	A
Customer 3	Sales Manager 2		Yes	Yes	25%	A	No	Yes	83	77	93%	6	A
Customer 4	Sales Manager 3		Yes	No	95%	B	Yes	Yes	483	53	11%	11	C
Customer 5	Sales Manager 1		Yes	Yes	90%	B	No	Yes	14	8	57%	1	A
Customer 6	Sales Manager 4		No	No	100%	B	No	Yes	23	13	57%	2	A
Customer 7	Sales Manager 5		Yes	Yes	80%	B	No	Yes	62	62	100%	12	A
Customer 8	Sales Manager 6		Yes	Yes	42%	A	No	Yes	68	63	93%	14	A
Customer 9	Sales Manager 2		Yes	Yes	75%	B	No	Yes	87	58	67%	5	A
Customer 10	Sales Manager 5		Yes	Yes	60%	B	No	Yes	26	26	100%	2	A
Customer 11	Sales Manager 7		Yes	Yes	35%	A	No	Yes	52	49	94%	1	A
Customer 12	Sales Manager 8		Yes	Yes	25%	A	Yes	Yes	32	29	91%	8	B
Customer 13	Sales Manager 9		Yes	No	50%	B	Yes	Yes	51	27	53%	17	C
Customer 14	Sales Manager 5		Yes	Yes	55%	B	No	Yes	14	14	100%	3	A
Customer 15	Sales Manager 10		Yes	Yes	30%	A	No	Yes	60	8	13%	3	A
Customer 16	Sales Manager 11		Yes	No	40%	A	No	Yes	10	2	20%	3	A
Customer 17	Sales Manager 6		Yes	Yes	58%	B	No	Yes	34	26	76%	4	A
Customer 18	Sales Manager 3		No	No	100%	B	Yes	Yes	168	10	6%	1	C
Customer 19	Sales Manager 12		Yes	Yes	75%	B	No	Yes	83	45	54%	2	A
Customer 20	Sales Manager 13		Yes	Yes	65%	B	No	Yes	38	12	32%	3	A

- **Bottom 20 Customers**

Name	Sales Manager	Sales revenue in BA (last year for existing clients / expected for new clients)	Client buys the remaining product portfolio to more than 1 supplier?	SKUs being bought to other suppliers are within BA's current portfolio?	What is the estimated share of wallet of BA products within customer's portfolio?	Baseline Evaluation	Is the client a Dealer?	BA is the exclusive supplier for one or more SKUs?	How many SKUs does BA produces to the client?	How many exclusive SKUs does BA produces to to the client?	Weight of exclusive SKUs / Total SKUs	In how many markets does BA deliver products?	Final Evaluation
Customer 684	Sales Manager 19	[redacted]	Yes	Yes	20%	C	No	Yes	2	1	50%	1	B
Customer 685	Sales Manager 16	[redacted]	No	Yes	0%	C	No	No	6	0	0%	1	C
Customer 686	Sales Manager 16	[redacted]	No	No	100%	D	No	Yes	3	0	0%	1	C
Customer 687	Sales Manager 16	[redacted]	No	No	100%	D	No	Yes	4	0	0%	1	C
Customer 688	Sales Manager 16	[redacted]	No	Yes	30%	C	No	Yes	7	0	0%	1	B
Customer 689	Sales Manager 31	[redacted]	No	Yes	80%	D	No	No	5	0	0%	1	D
Customer 690	Sales Manager 22	[redacted]	No	No	95%	D	No	Yes	3	3	100%	1	C
Customer 691	Sales Manager 16	[redacted]	No	No	30%	D	No	No	27	0	0%	1	D
Customer 692	Sales Manager 26	[redacted]	Yes	Yes	25%	C	No	No	3	0	0%	1	C
Customer 693	Sales Manager 17	[redacted]	No	No	5%	D	No	No	1	0	0%	1	D
Customer 694	Sales Manager 27	[redacted]	Yes	Yes	30%	C	No	No	1	0	0%	1	C
Customer 695	Sales Manager 16	[redacted]	No	Yes	20%	C	No	Yes	1	0	0%	1	B
Customer 696	Sales Manager 16	[redacted]	No	Yes	50%	D	No	Yes	4	0	0%	1	C
Customer 697	Sales Manager 20	[redacted]	Yes	Yes	1%	C	No	No	3	0	0%	1	C
Customer 698	Sales Manager 16	[redacted]	Yes	Yes	0%	C	No	No	7	0	0%	1	C
Customer 699	Sales Manager 9	[redacted]	Yes	No	20%	C	No	No	4	1	25%	1	C
Customer 700	Sales Manager 10	[redacted]	No	Yes	2%	C	No	No	1	0	0%	1	C
Customer 701	Sales Manager 17	[redacted]	Yes	Yes	0%	C	No	No	1	0	0%	1	C
Customer 702	Sales Manager 29	[redacted]	Yes	Yes	40%	C	No	No	2	0	0%	1	C
Customer 703	Sales Manager 30	[redacted]	No	No	30%	D	No	No	4	0	0%	1	D

APPENDIX F: Variables Results - Summary

Evaluation			Sales Revenue	Growth Potential	Dealer	BA Exclusivity	SKU Exclusivity	N Markets
A	A	N	30	30	30	30	30	30
		Mean	7310793,33	1,00	0,00	0,70	0,6042	3,33
		Median	4083834,50	1,00	0,00	1,00	0,6703	2,00
		Sum	219323800	30	0	21	18,13	100
		Minimum	2007403	1	0	0	0,00	1
		Maximum	55810344	1	0	1	1,00	18
		Std. Deviation	10098131,788	0,000	0,000	0,466	0,35467	3,925
		% of Total Sum	27,7%	9,1%	0,0%	5,2%	10,4%	10,8%
		% of Total N	4,3%	4,3%	4,3%	4,5%	4,3%	4,3%
	B	N	8	8	8	8	8	8
		Mean	4821052,25	1,00	1,00	0,88	0,3315	3,63
		Median	4090329,50	1,00	1,00	1,00	0,2384	2,00
		Sum	38568418	8	8	7	2,65	29
		Minimum	2222190	1	1	0	0,00	1
		Maximum	12291346	1	1	1	0,91	10
		Std. Deviation	3324599,376	0,000	0,000	0,354	0,33175	3,503
		% of Total Sum	4,9%	2,4%	7,3%	1,7%	1,5%	3,1%
		% of Total N	1,1%	1,1%	1,1%	1,2%	1,1%	1,1%
	Total	N	38	38	38	38	38	38
		Mean	6786637,32	1,00	0,21	0,74	0,5468	3,39
		Median	4083834,50	1,00	0,00	1,00	0,5497	2,00
		Sum	257892218	38	8	28	20,78	129
		Minimum	2007403	1	0	0	0,00	1
		Maximum	55810344	1	1	1	1,00	18
		Std. Deviation	9114462,539	0,000	0,413	0,446	0,36347	3,796
		% of Total Sum	32,6%	11,5%	7,3%	6,9%	12,0%	13,9%
		% of Total N	5,4%	5,4%	5,4%	5,6%	5,4%	5,4%
B	A	N	33	33	33	33	33	33
		Mean	7170892,85	0,00	0,00	0,97	0,5091	2,12
		Median	4594972,00	0,00	0,00	1,00	0,5422	1,00
		Sum	236639464	0	0	32	16,80	70

		Minimum	2013015	0	0	0	0,00	1
		Maximum	38094956	0	0	1	1,00	12
		Std. Deviation	7160160,428	0,000	0,000	0,174	0,35150	2,132
		% of Total Sum	29,9%	0,0%	0,0%	7,9%	9,7%	7,6%
		% of Total N	4,7%	4,7%	4,7%	4,9%	4,7%	4,7%
	B	N	3	3	3	3	3	3
		Mean	2763586,00	0,00	0,00	0,00	0,0392	1,00
		Median	3046012,00	0,00	0,00	0,00	0,0000	1,00
		Sum	8290758	0	0	0	0,12	3
		Minimum	2087273	0	0	0	0,00	1
		Maximum	3157473	0	0	0	0,12	1
		Std. Deviation	588349,678	0,000	0,000	0,000	0,06792	0,000
		% of Total Sum	1,0%	0,0%	0,0%	0,0%	0,1%	0,3%
		% of Total N	0,4%	0,4%	0,4%	0,4%	0,4%	0,4%
	C	N	8	8	8	8	8	8
		Mean	7847965,25	0,00	1,00	1,00	0,1583	4,75
		Median	6835014,50	0,00	1,00	1,00	0,1153	1,50
		Sum	62783722	0	8	8	1,27	38
		Minimum	2178926	0	1	1	0,01	1
		Maximum	18929775	0	1	1	0,53	17
		Std. Deviation	5366188,726	0,000	0,000	0,000	0,16509	6,018
		% of Total Sum	7,9%	0,0%	7,3%	2,0%	0,7%	4,1%
		% of Total N	1,1%	1,1%	1,1%	1,2%	1,1%	1,1%
	Total	N	44	44	44	44	44	44
		Mean	6993498,73	0,00	0,18	0,91	0,4133	2,52
		Median	4605577,50	0,00	0,00	1,00	0,4086	1,00
		Sum	307713944	0	8	40	18,18	111
		Minimum	2013015	0	0	0	0,00	1
		Maximum	38094956	0	1	1	1,00	17
		Std. Deviation	6653190,792	0,000	0,390	0,291	0,35425	3,238
		% of Total Sum	38,9%	0,0%	7,3%	9,9%	10,5%	12,0%
		% of Total N	6,3%	6,3%	6,3%	6,5%	6,3%	6,3%
C	B	N	125	125	125	125	125	125
		Mean	449056,66	1,00	0,00	0,82	0,4277	1,27
		Median	264625,00	1,00	0,00	1,00	0,2609	1,00
		Sum	56132082	125	0	102	53,47	159
		Minimum	29773	1	0	0	0,00	1
		Maximum	1812297	1	0	1	1,00	13
		Std. Deviation	456871,776	0,000	0,000	0,389	0,42302	1,194
		% of Total Sum	7,1%	37,9%	0,0%	25,2%	30,8%	17,2%
		% of Total N	17,8%	17,8%	17,8%	18,5%	17,8%	17,8%

		N	117	117	117	117	117	117
		Mean	189987,44	1,00	0,00	0,00	0,0288	1,00
		Median	79490,00	1,00	0,00	0,00	0,0000	1,00
		Sum	22228531	117	0	0	3,37	117
	C	Minimum	28144	1	0	0	0,00	1
		Maximum	1554422	1	0	0	0,50	1
		Std. Deviation	270296,378	0,000	0,000	0,000	0,08997	0,000
		% of Total Sum	2,8%	35,5%	0,0%	0,0%	1,9%	12,6%
		% of Total N	16,6%	16,6%	16,6%	17,4%	16,6%	16,6%
		N	50	50	50	50	50	50
		Mean	413443,26	1,00	1,00	0,52	0,1141	1,38
		Median	190006,50	1,00	1,00	1,00	0,0000	1,00
		Sum	20672163	50	50	26	5,70	69
	D	Minimum	31421	1	1	0	0,00	1
		Maximum	1988869	1	1	1	1,00	4
		Std. Deviation	501788,828	0,000	0,000	0,505	0,23680	0,780
		% of Total Sum	2,6%	15,2%	45,9%	6,4%	3,3%	7,4%
		% of Total N	7,1%	7,1%	7,1%	7,4%	7,1%	7,1%
		N	292	292	292	292	292	292
		Mean	339153,34	1,00	0,17	0,44	0,2142	1,18
		Median	133931,00	1,00	0,00	0,00	0,0000	1,00
		Sum	99032776	292	50	128	62,54	345
	Total	Minimum	28144	1	0	0	0,00	1
		Maximum	1988869	1	1	1	1,00	13
		Std. Deviation	418985,137	0,000	0,377	0,497	0,35220	0,856
		% of Total Sum	12,5%	88,5%	45,9%	31,6%	36,0%	37,2%
		% of Total N	41,5%	41,5%	41,5%	43,3%	41,5%	41,5%
D		N	210	210	210	203	210	210
		Mean	432024,79	0,00	0,00	0,95	0,3099	1,04
		Median	211503,00	0,00	0,00	1,00	0,0513	1,00
		Sum	90725205	0	0	193	65,08	219
	C	Minimum	29677	0	0	0	0,00	1
		Maximum	1949790	0	0	1	1,00	2
		Std. Deviation	496703,262	0,000	0,000	0,217	0,40258	0,203
		% of Total Sum	11,5%	0,0%	0,0%	47,7%	37,4%	23,6%
		% of Total N	29,9%	29,9%	29,9%	30,1%	29,9%	29,9%
		N	119	119	119	97	119	119
		Mean	299454,60	0,00	0,36	0,16	0,0606	1,03
	D	Median	146936,00	0,00	0,00	0,00	0,0000	1,00
		Sum	35635097	0	43	16	7,21	123
		Minimum	27810	0	0	0	0,00	1

		Maximum	1857412	0	1	1	1,00	3
		Std. Deviation	392500,160	0,000	0,482	0,373	0,17682	0,223
		% of Total Sum	4,5%	0,0%	39,4%	4,0%	4,1%	13,3%
		% of Total N	16,9%	16,9%	16,9%	14,4%	16,9%	16,9%
	Total	N	329	329	329	300	329	329
		Mean	384073,87	0,00	0,13	0,70	0,2197	1,04
		Median	177814,00	0,00	0,00	1,00	0,0000	1,00
		Sum	126360302	0	43	209	72,29	342
		Minimum	27810	0	0	0	0,00	1
		Maximum	1949790	0	1	1	1,00	3
		Std. Deviation	465508,005	0,000	0,338	0,460	0,35905	0,210
		% of Total Sum	16,0%	0,0%	39,4%	51,6%	41,6%	36,9%
		% of Total N	46,8%	46,8%	46,8%	44,5%	46,8%	46,8%
Total	A	N	63	63	63	63	63	63
		Mean	7237512,13	0,48	0,00	0,84	0,5544	2,70
		Median	4177572,00	0,00	0,00	1,00	0,5652	2,00
		Sum	455963264	30	0	53	34,93	170
		Minimum	2007403	0	0	0	0,00	1
		Maximum	55810344	1	0	1	1,00	18
		Std. Deviation	8611766,126	0,503	0,000	0,368	0,35341	3,150
		% of Total Sum	57,6%	9,1%	0,0%	13,1%	20,1%	18,3%
		% of Total N	9,0%	9,0%	9,0%	9,3%	9,0%	9,0%
	B	N	136	136	136	136	136	136
		Mean	757288,66	0,98	0,06	0,80	0,4135	1,40
		Median	334768,00	1,00	0,00	1,00	0,2500	1,00
		Sum	102991258	133	8	109	56,24	191
		Minimum	29773	0	0	0	0,00	1
		Maximum	12291346	1	1	1	1,00	13
		Std. Deviation	1387805,989	0,147	0,236	0,400	0,41694	1,502
		% of Total Sum	13,0%	40,3%	7,3%	26,9%	32,4%	20,6%
		% of Total N	19,3%	19,3%	19,3%	20,2%	19,3%	19,3%
	C	N	335	335	335	328	335	335
		Mean	524589,43	0,35	0,02	0,61	0,2081	1,12
		Median	132824,00	0,00	0,00	1,00	0,0000	1,00
		Sum	175737458	117	8	201	69,72	374
		Minimum	28144	0	0	0	0,00	1
		Maximum	18929775	1	1	1	1,00	17
		Std. Deviation	1453432,066	0,477	0,153	0,488	0,35019	1,053
		% of Total Sum	22,2%	35,5%	7,3%	49,6%	40,1%	40,3%
		% of Total N	47,7%	47,7%	47,7%	48,7%	47,7%	47,7%
	D	N	169	169	169	147	169	169

	Mean	333179,05	0,30	0,55	0,29	0,0764	1,14
	Median	151169,00	0,00	1,00	0,00	0,0000	1,00
	Sum	56307260	50	93	42	12,91	192
	Minimum	27810	0	0	0	0,00	1
	Maximum	1988869	1	1	1	1,00	4
	Std. Deviation	429381,630	0,458	0,499	0,453	0,19727	0,487
	% of Total Sum	7,1%	15,2%	85,3%	10,4%	7,4%	20,7%
	% of Total N	24,0%	24,0%	24,0%	21,8%	24,0%	24,0%
Total	N	703	703	703	674	703	703
	Mean	1125176,73	0,47	0,16	0,60	0,2472	1,32
	Median	199953,00	0,00	0,00	1,00	0,0000	1,00
	Sum	790999240	330	109	405	173,80	927
	Minimum	27810	0	0	0	0,00	1
	Maximum	55810344	1	1	1	1,00	18
	Std. Deviation	3416399,638	0,499	0,362	0,490	0,36565	1,447
	% of Total Sum	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
	% of Total N	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

APPENDIX G: TwoStep Cluster Analysis

Clusters

Input (Predictor) Importance
1.0 0.8 0.6 0.4 0.2 0.0

Cluster	2	4	1	3
Label				
Description				
Size	34.0% (229)	32.2% (217)	20.3% (137)	13.5% (91)
Inputs	Dealer 0 (100.0%)	Dealer 0 (100.0%)	Dealer 0 (97.1%)	Dealer 1 (100.0%)
	BA_Exclusivity 0 (100.0%)	BA_Exclusivity 1 (100.0%)	BA_Exclusivity 1 (98.5%)	BA_Exclusivity 1 (58.2%)
	Growth_Potential 1 (64.6%)	Growth_Potential 0 (100.0%)	Growth_Potential 1 (92.0%)	Growth_Potential 1 (61.5%)
	SKU_Exclusivity 0.15	SKU_Exclusivity 0.27	SKU_Exclusivity 0.44	SKU_Exclusivity 0.12
	Sales_Revenue 376,335.90	Sales_Revenue 838,454.81	Sales_Revenue 3,139,352.65	Sales_Revenue 982,618.10
	N_Markets 1.07	N_Markets 1.08	N_Markets 2.15	N_Markets 1.35

APPENDIX H: Spearman Correlation Test

Correlations

			Final_Evaluation	Sales_Revenue	Growth_Potential	Dealer	BA_Exclusivity	SKU_Exclusivity	N_Markets
Spearman's rho	Final_Evaluation	Correlation Coefficient	1,000	.351**	.359**	-.481**	.374**	.408**	.260**
		Sig. (2-tailed)		0,000	0,000	0,000	0,000	0,000	0,000
		N	703	703	703	703	703	703	703
	Sales_Revenue	Correlation Coefficient	.351**	1,000	-0,062	0,070	.318**	.406**	.388**
		Sig. (2-tailed)	0,000		0,101	0,063	0,000	0,000	0,000
		N	703	703	703	703	703	703	703
	Growth_Potential	Correlation Coefficient	.359**	-0,062	1,000	0,054	-.256**	0,008	.113**
		Sig. (2-tailed)	0,000	0,101		0,154	0,000	0,831	0,003
		N	703	703	703	703	674	703	703
	Dealer	Correlation Coefficient	-.481**	0,070	0,054	1,000	-0,001	-0,056	.140**
		Sig. (2-tailed)	0,000	0,063	0,154		0,985	0,136	0,000
		N	703	703	703	703	703	703	703
	BA_Exclusivity	Correlation Coefficient	.374**	.318**	-.256**	-0,001	1,000	.294**	.149**
		Sig. (2-tailed)	0,000	0,000	0,000	0,985		0,000	0,000
		N	703	703	703	703	703	703	703
	SKU_Exclusivity	Correlation Coefficient	.408**	.406**	0,008	-0,056	.294**	1,000	.288**
		Sig. (2-tailed)	0,000	0,000	0,831	0,136	0,000		0,000
		N	703	703	703	703	703	703	703
	N_Markets	Correlation Coefficient	.260**	.388**	.113**	.140**	.149**	.288**	1,000
		Sig. (2-tailed)	0,000	0,000	0,003	0,000	0,000	0,000	
		N	703	703	703	703	703	703	703

**. Correlation is significant at the 0.01 level (2-tailed).

APPENDIX I: Segments Characterization

- Segment A

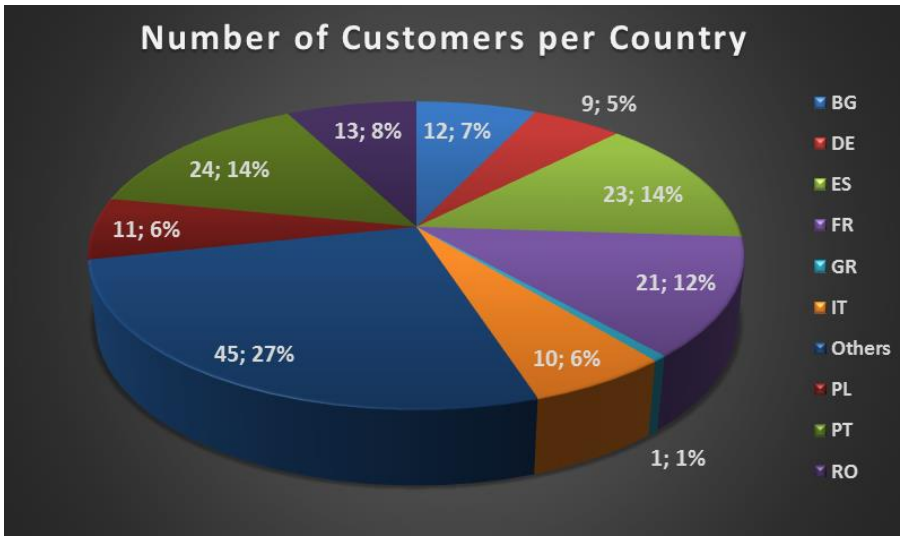


Figure 6.6: Number of A customers per country

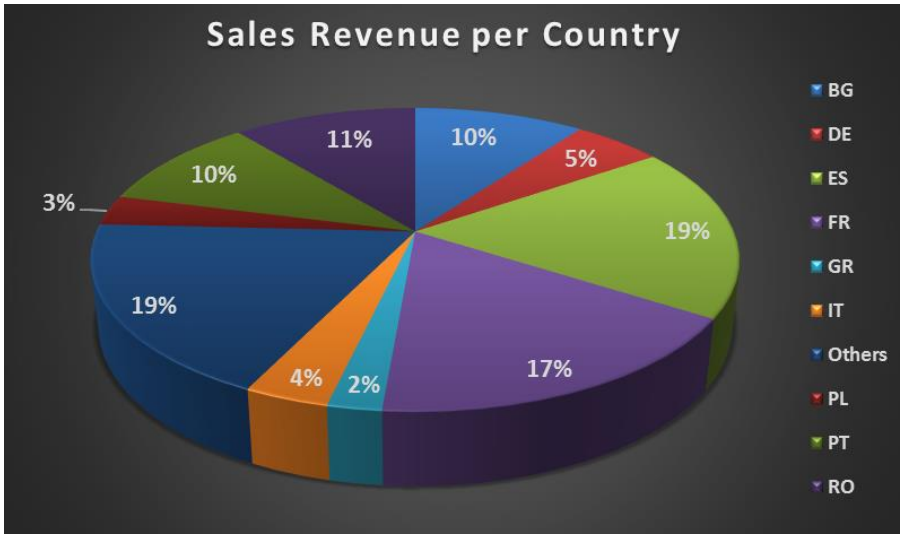


Figure 6.7: Sales revenue of A customers per country

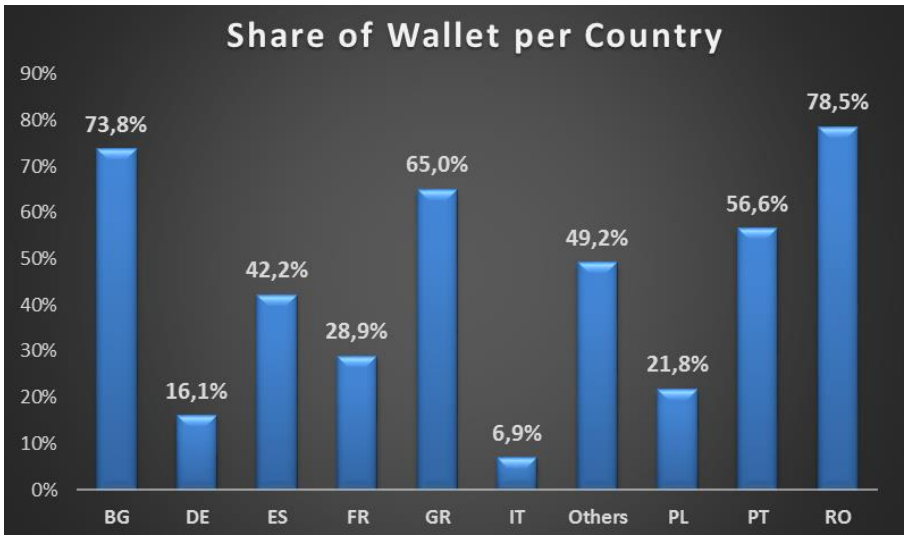


Figure 6.8: Average share of wallet within A customers per country

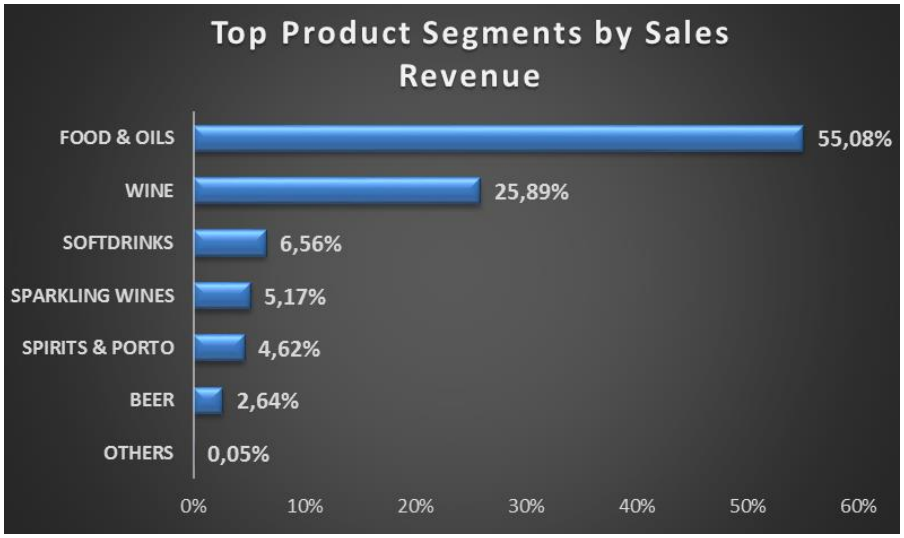


Figure 6.9: Top product segments for A customers by sales revenue

- Segment B

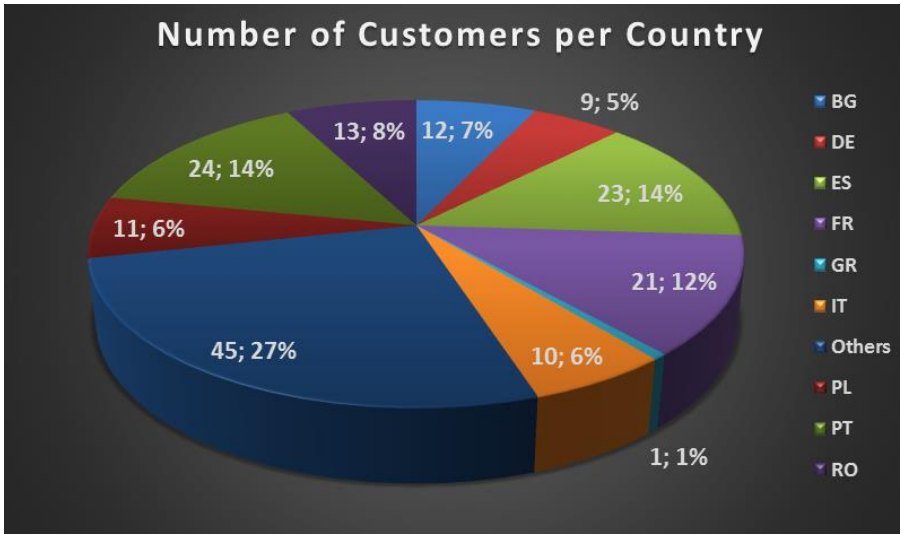


Figure 6.10: Number of B customers per country

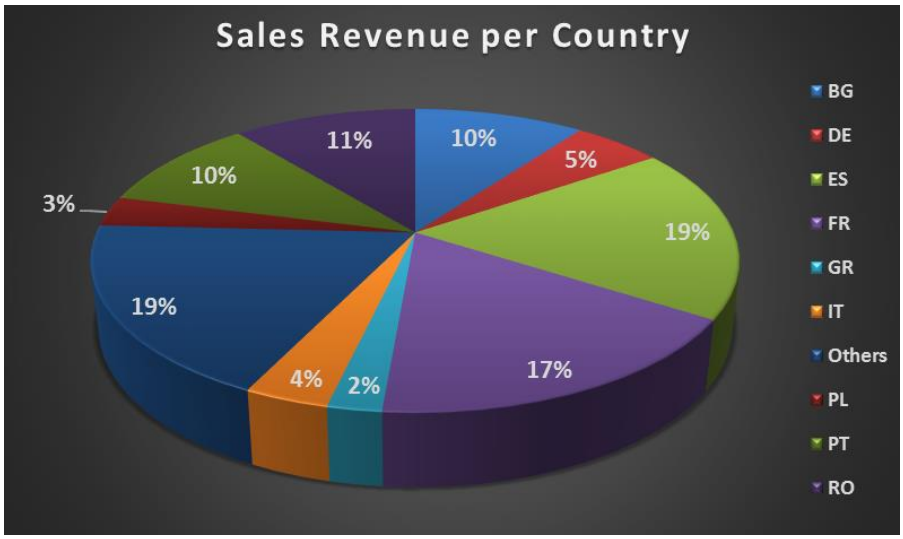


Figure 6.11: Sales revenue of B customers per country

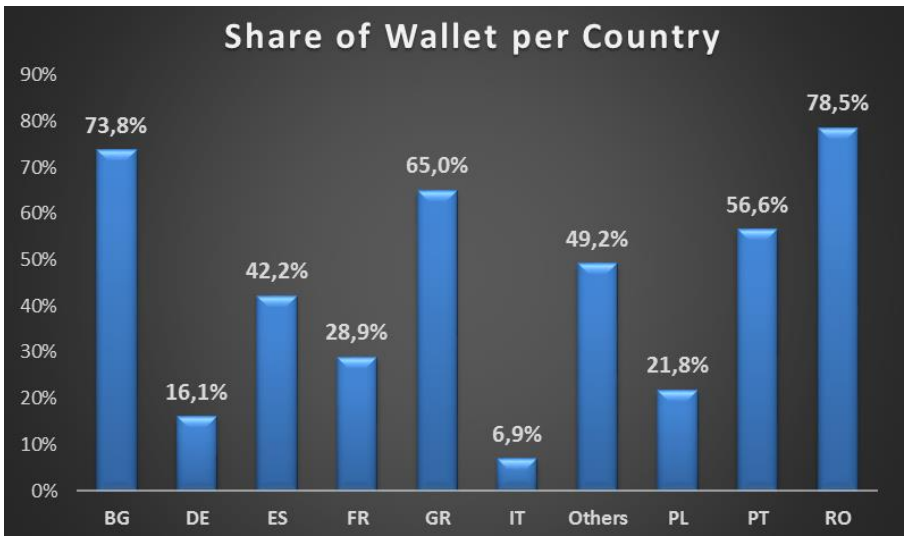


Figure 6.12: Average share of wallet within B customers per country

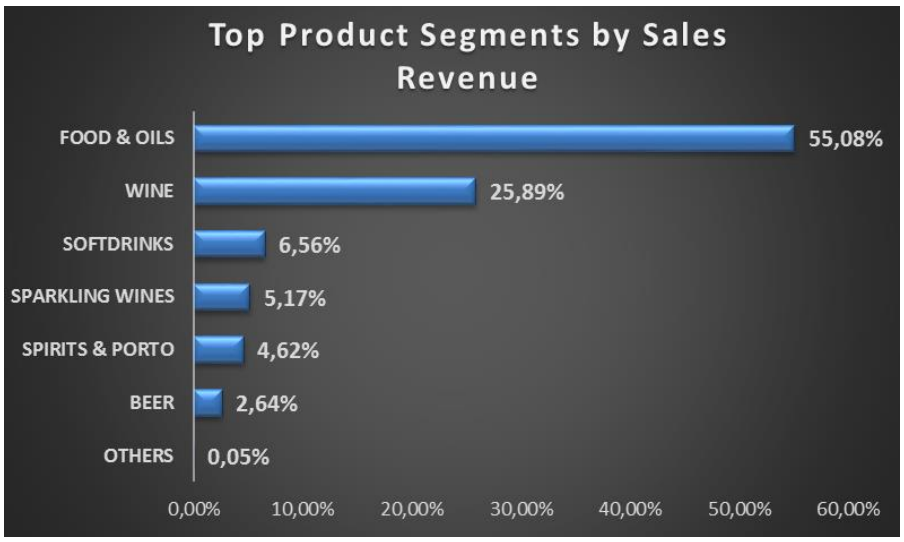


Figure 6.13: Top product segments for B customers by sales revenue

- Segment C

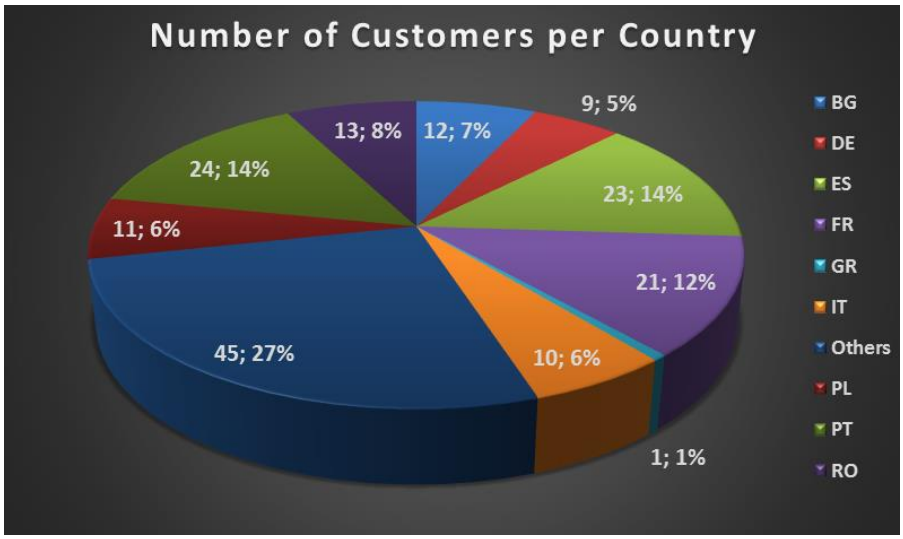


Figure 6.14: Number of C customers per country

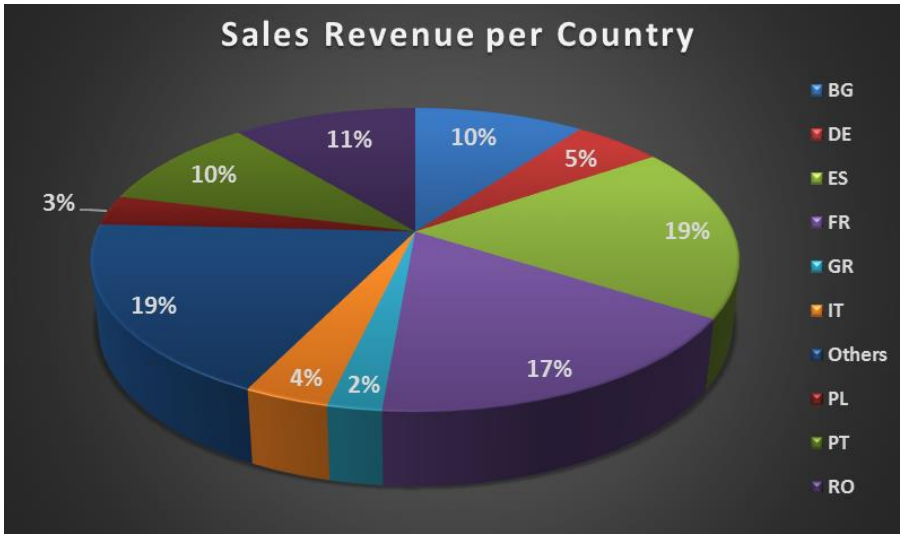


Figure 6.15: Sales revenue of C customers per country

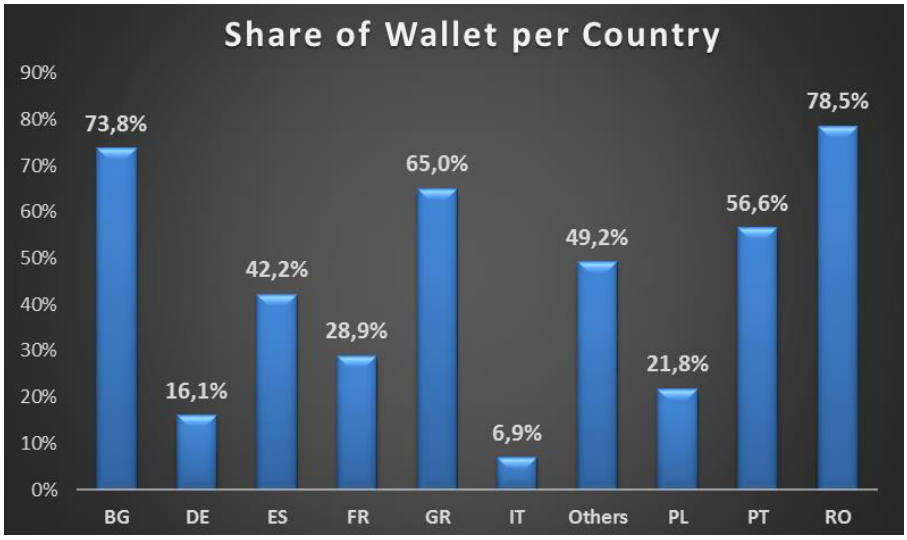


Figure 6.16: Average share of wallet within C customers per country

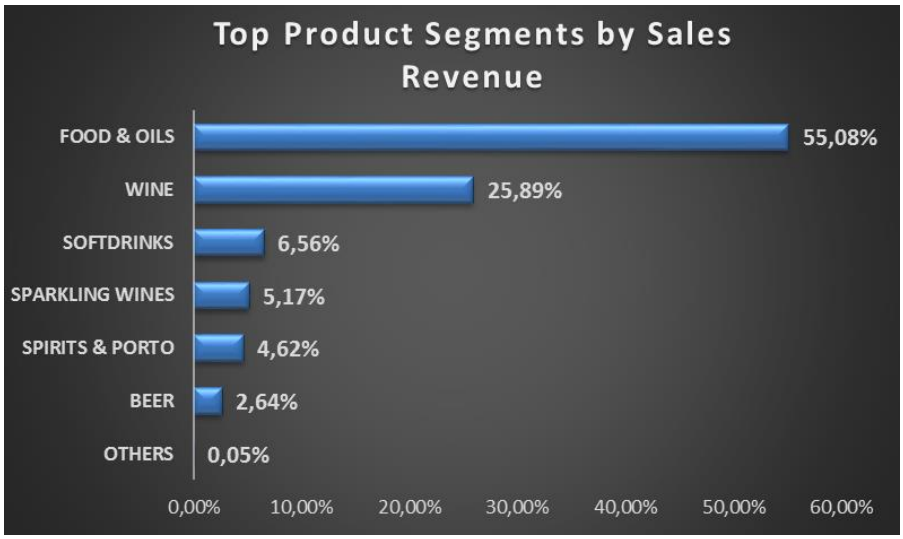


Figure 6.17: Top product segments for C customers by sales revenue

- Segment D

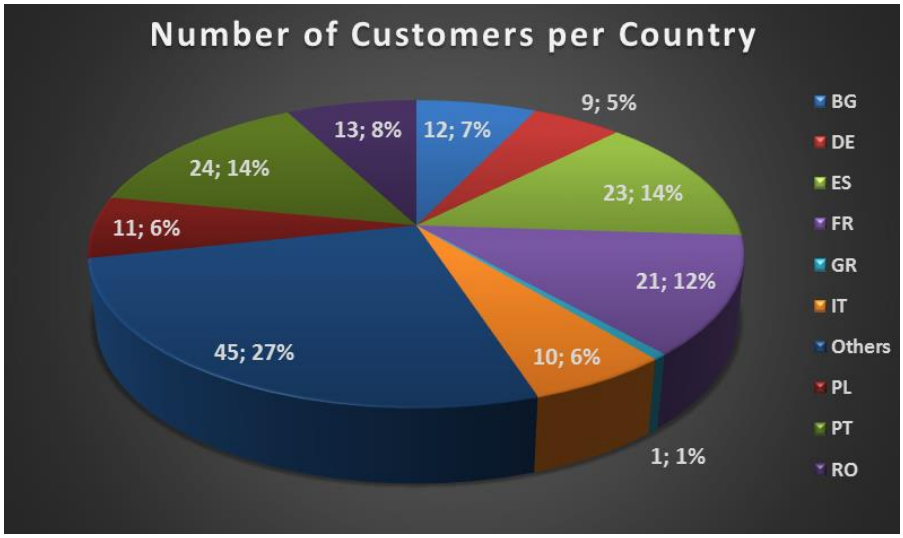


Figure 6.18: Number of D customers per country

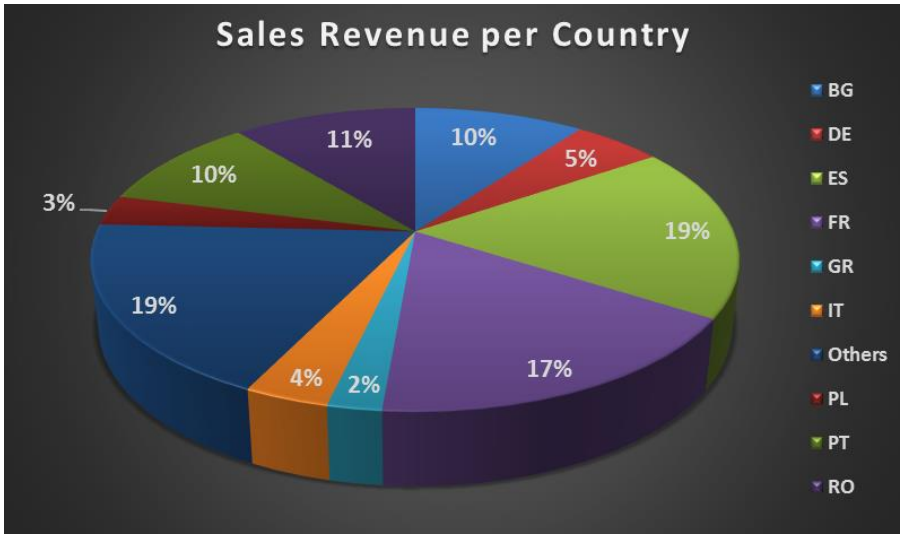


Figure 6.19: Sales revenue of D customers per country

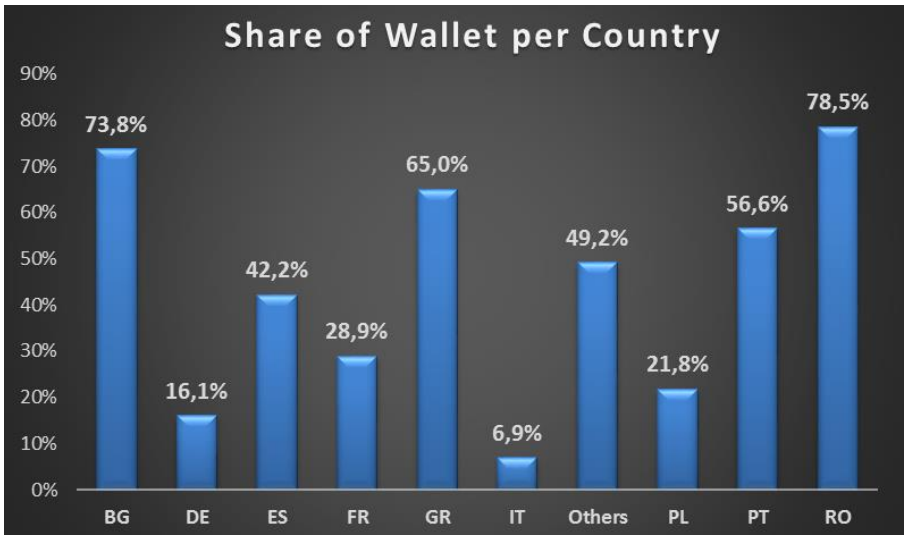


Figure 6.20: Average share of wallet within D customers per country

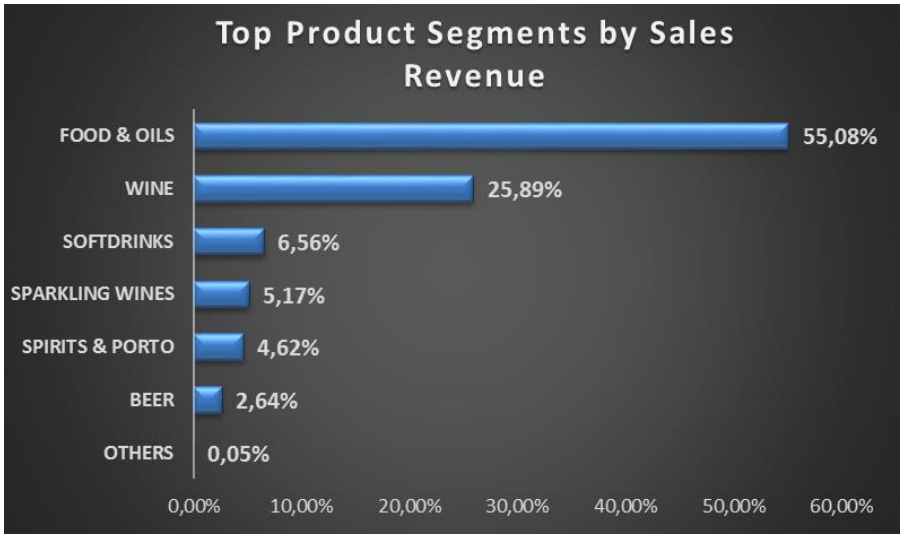


Figure 6.21: Top product segments for D customers by sales revenue