School of Industrial and Information Engineering
Master of Science in Management Engineering

Logistics service optimization
- The case of Luxottica -

Supervisor:
Prof. Alessandro Perego

Master Graduation Thesis by:
Giacomo Lucchetta [835550]

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ABSTRACT

The purpose of this thesis is to describe an analytical and practical approach to assess the costs and benefits of a logistics services rationalization in the eyewear industry.

The thesis is based on a literature review and a classification of the main contributions regarding the assessment of logistics services impact on customers and suppliers. The impact of logistics services rationalization on supply chain processes has been modelled using a quantitative approach applied to a real world case. An extensive, ten-month interaction with the business environment and a refinement process with the logistics and supply chain managers of Luxottica is conducted to collect the required inputs and to practically implement the solution.

Different markets within the European area and special kinds of customers have been explored. The business case conducted for United Kingdom and Germany shows limited benefits, whereas the actual potential of the model becomes clear for Spain, France and Italy. The profitability of this project is significantly affected by the costs of delivery services and by the characteristics of the service required by the different customers. The model provides a clear assessment of how and when a positive return, both in monetary and in service level terms, can be achieved.

This is one attempt to provide a comprehensive analysis of the costs and benefits of a logistics service rationalization, taking into account all the major factors involved and focusing on a real world case. The model can be a valid support to large companies willing to improve the service offered to their customer without incurring in extra costs.
EXECUTIVE SUMMARY

THE PROBLEM

Luxottica Group is a leader in premium, luxury and sports eyewear with over 7,000 optical and sun retail stores in North America, Asia-Pacific, China, South Africa, Latin America and Europe, and a strong, well-balanced brand portfolio which includes about the 70% of the world’s most known brands. In addition to a global wholesale network involving 130 different countries, the Group manages leading retail chains in major markets. In 2014 Luxottica Group posted net sales of more than € 7.6 billion confirming its dominant position in the eyewear industry. The solidity of the Group is additionally boosted by its completely vertically integrated business model and by its focus on product and service quality. The almost absence of threatening close competitors gives the Company the possibility to shift the focus from the competition against rivals to the performance toward its customers, which are generally provided with an excellent service level. Actually the performance of Luxottica in terms of service provided to its clients sometimes might result even over-estimated in respect to what perceived as essential: the Company, through a world-class logistics network, is used to succeed in delivering goods in a while all around the world and with an excellent capability to meet its customers’ requests. However, since these performances can be considered as exceeding expectations, and even since nowadays customers are not always targeted with customized logistics services, Luxottica believes there is still room for improvement. In particular, as things currently stands, the Company generally segments its customers from a commercial point of view, providing them with ad-hoc assortments and tailor made collections. Nevertheless, from a logistics viewpoint, the concept of customers’ classes is decoupled from the actual provision of services and for that reason all clients are served in the shortest possible time and with highest possible shipping frequency, even though they might accept and willing also less frequent deliveries. It is thus clear that the cost-to-serve might be studied and then optimized.

RELEVANCE AND COMPLEXITY

The above mentioned problematic regards the entire Luxottica’s network in which customer satisfaction represents the main pillar for the Company and where the Logistics has the hard tasks to deliver the right quantity in the right place at the right time. Actually in a so complex and highly interconnected world as Luxottica’s one is an apparently simple and soft touch in a variable generally engenders hundreds of small-to-large scale changes that might distress the balance of the overall business; then this cause and effect relationship is even more exasperated when dealing with the logistics in the fashion industry, where a late arrival of a frame might cause the impossibility to launch an event for a well-known brand. This is the reason why the study of the variables affected
by a possible service rationalization has to be carefully evaluated and a cross-cutting effort is needed from all the different teams involved. In addition to the strong degree of complexity given by the industry-specifics characteristics it is crucial to take into account the cost side that the logistics machine entails for the entire organization. Nowadays it is reasonable to assume that logistics related costs account for about the 5% of the annual Company’s turnover (Alicke, 2012), where this slice of costs can be further split in warehousing and transportation, and the latter account for more than the 47%[^2] on the total. Thus the revision of logistics services might impact on the 2.4% of Luxottica’s spending becoming one of the most relevant actions to be put in place in order to achieve a sort of cost review and reduction. Additionally, given the recent Luxottica’s strategy to centralize more and more the stock and thus to serve the customers directly from the primary distribution centres bypassing the second echelon with direct to customers shipments, the choice of the right transportation mode will increase year over year its impact, both in terms of service level and in terms of costs. Finally the research will consider as sample one of the most promising Luxottica’s business, the so called STARS one, for which the Company has increased its emphasis over the recent years and has planned a double digit growth for the incoming 5 years ahead.

**OBJECTIVES**
The opportunity to revise the logistics services and to introduce a sort of customization for them could have a strong impact on both costs rationalization and service level, driving toward a higher customer satisfaction, a better consciousness on costs and a superior warehouse planning.

Therefore, the main objective of this study is to develop a model enabling firms involved in the business-to-business markets to increase the effectiveness and the efficiency of their physical distribution system. Nevertheless, given the double-side of the study, characterized by a literature review and by an on-field experience, the achievement of this objective naturally engenders the needs to:

- Analyse the scientific journals and papers in order to appraise the evolution of the whole research production;
- Analyse, through an on-field experience, how the eyewear industry leader Luxottica is coping with these themes;

Once the objective related to the development of the above mentioned model would be achieved its validity will be proved by applying its rules to a particular and narrow set of customers. Subsequently, if results would be promising, Luxottica’s objective is to apply it on a broader set of customers.
METHODOLOGY

The way toward the achievement of the research objectives consists in a step-by-step analysis made of five either sequential or parallel macro-phases linked each other by input-output relationships. Some macro-phases are then composed by different sub-phases, linked to input-output relationships as well. The main phases taken into consideration are reported here below:

![Figure 1 – Macro phases composing the methodology analysis](image)

Environment and business comprehension and mapping is considered to be the backbone of the whole study: throughout this phase the general rules behind Luxottica's business model have been discovered and comprehended, and a precious set of embedded knowledge has emerged and pointed out.

As soon as the awareness of the environment has been achieved the study moved to the next phase where two parallel themes are have been examined on details. On one hand STARS trade channel, given its prominence for Luxottica, has been deeply dived; on the other hand an assessment of the existing literature has been performed. Precisely the strategic relevance of STARS business model is nowadays well supported by the corporate strategy that has decided to serve these opticians with the highest possible priority: this is the reason why, in addition to a general comprehension of the environment also a deep dive on this particular business model has been carried out. Then the literature review consisted in the all-round appraisal of the contributions related to the main topics touched within the study: the systematic examination of the published papers has allowed accumulating precious knowledge about the research themes and making the point about the state of the art in the field of research. The literature review has also helped to point out what are the main gaps between the best performing institutions and the Company under examination. Moreover this first step has acted as a fly-wheel for collecting new ideas and for sharpening the objectives of the research. The literature review exploited the large number of articles collected in the academic journals, the great variety of papers published by scholars and industry experts, and in less part, academic thesis, and books. During this phase of the dissertation, 52 papers have been reviewed. Particularly, the papers research followed different streams, each of them more or less concatenated to the main topic of the study.
Once a precise and well-comprehensive awareness of the theoretical frameworks and of the practical world as well has been achieved the analysis phase has started. It is subdivided in three main steps:

- The AS IS scenario analysis, through which the actual way in which business was conducted has been highlighted;
- Insights for improvement, through which the possible main improvements to reinforce and enhance the business have been pointed out;
- The TO BE scenario, though which the effects of the improvements have been hypothesized;

In order to get a comprehensive and all-round picture of the current scenario encompassing all the different aspects the involvement of the most disparate business functions has been required. More in details Transportation and Customer Service Teams have interacted closely with the aim to provide a structured and well comprehensible framework on how the business has been actually working and what would have been the most relevant actions to be taken in order to improve it. Logistics Supply and Purchasing Department has been involved in order to provide support in terms of tariff requirements and supplier negotiation, and finally Sales and Planning, the owners of the business, have been requested to validate the analysis. On top of Luxottica’s Logistics corporate teams a special consideration has been granted to the Subsidiaries, which, as a matter of fact, have a great sensitivity on customers’ needs and perceptions.

During the analysis of the AS IS scenario a critique and reviewing approach has been implemented: thorough the interactions with the different teams there has been the possibility to collect some clues that represented then the fundamental pillars for the possible improvements. Every variable that was considered not fully and optimally operational within the AS IS scenario has been widely discussed and enhanced. This continuous deep dive has been supported by a twofold trial-and-error process: the choices on how to improve the current set-up have been firstly looked and discussed with the Logistics Customers Service team that during the whole duration of the project has acted as a link between Transportation and STARS Planning, in a weekly review. Starting from the needs of the business, Transportation Team had proposed a new classification of STARS customers parallel to the one already identified and still utilized by the Sales and Commercial Team. Even though the creation of an additional way of clustering customers can be intended as a way to increase the management complexity of customers, it allows to decouple Sales and Commercial scope, such as assortments and brands selection, from Logistics scope, such as service level and service cost. In parallel a model to define the optimal Order To Delivery Lead Time theoretically achievable by working on the picking and shipping days has been created. This model takes into consideration the
delivery lead time agreed with forwarders and couriers and the number of times a customer should be served, and gives as output the optimal days in which to ship and the related Order To Delivery Lead Time. Afterward the above mentioned model has been coupled with the previously defined classes and the mock-up has been fine-tuned and then revised together with the business owners. The continuous interaction between Transportation and STARS planners has been fundamental in order to understand which services the market was expecting and what were the fundamental needs of the customers. In addition a careful evaluation of costs has been performed in order to see how the expenditure would have been changed and if glimmers for cost saving would have been arose.

As soon as the model has been set up the Logistics Customer Service Team devoted to the management of STARS customers had effectively implemented the outcome through the Company’s ERP. The change from the old model to the new one has been performed after the peak period in order not to complicate the management of the trade channel with the risk to throw the business out of balance in the high season. Additionally the first tests have been carried out for a sample of countries within the ones analysed in that research project: this had allowed understanding the goodness of the results of the model.

The profitability of the model has not been widely assessed due to the lack of actual data available, but the conditions to make the model applicable and profitable for other countries have been pointed out.

**EXPECTED RESULTS**

The project is expected to produce a tangible effect in the long term, and in particular it can steer Luxottica’s Logistics toward either a customer service improvement at the as-is costs, or an overall cost-to-serve frontier reduction at the as-is customer service.

The outcome would strongly depend on business needs, however, irrespectively from what will be requested from the market, it is reasonable to expect that all the leverages that could be touched without neither increase the complexity of the network nor involve extra costs will be touched. For instance if there would be room for improvement on the actual shipping calendar, improvements will be re-arranged in order to secure the shorter Order To Delivery possible with the actual network set-up. Then according to what the business would require, in respect to the AS IS scenario, it is reasonable to assume that a service improvement would be agreed mainly to the high-end part of the customers, while the service would be rationalized for the low end ones. The extra cost for the further service will be realistically offset by the savings achievable from the rationalization in the bottom part of the market.
1. THE EYEWEAR INDUSTRY

The global eyewear market consists of prescription glasses, sunglasses, lenses, contact lenses and ready-readers and it accounted for about $96 billion in 2015 (Global Market Insights Inc., 2016). It has increased with a healthy growth rate over the years and it is expected to increase further during the next five years were it has been estimated to reach about $140 billion by 2020 (Mellery-Pratt, 2015). From a geographical perspective, in 2014, North America eyewear market share accounted for over 30% of the volume and revenue share. The spur can be attributed to rising demand for plan sunglasses along with increasing consciousness regarding eye examination across the region. Asia Pacific eyewear market size was over 20% in 2014 in terms of revenue (Global Market Insights, 2016). Rapidly increasing wearer base is likely to drive consumption in the incoming years. Europe eyewear market size amounted to over 35% of the global revenue in 2014 (Global Market Insights, 2016), primarily due to high average selling prices and the presence of key participants in the region. Finally Latin America, driven by Brazil is expected to witness steady gains over the next years. The global eyewear market is fragmented due to the presence of a few international and many local players operating in the market. The largest international vendors are headquartered in Europe, especially Italy, while few others are based in US. Every one of these vendors has an extensive product and brand portfolio and an online presence as well as retail chains, which are a must to be able to compete in this industry. The market is supported by various growth drivers, such as aging population, urbanization, rise of middle income, increasing number of people requiring vision correction and use of eyewear as a fashion statement.

In the following paragraphs the eyewear industry will be introduced with respect to its production and players; additionally its evolution and development over years will be pointed out. Once an all-round general perspective will become clear a deep dive about the political, economic, social, technological and legal external aspects will be carried out as well as a further disquisition of the main internal forces that are shaping the industry. Finally the main trends that will drive the industry for the incoming years will be briefly discussed.

1.1 THE PRODUCT

The eyewear market can be segregated into Plano Sunglasses, Spectacles, and Contact Lenses. The spectacles segment dominates the global eyewear market in terms of revenue and is expected to grow at a CAGR of close to 7% during the next four years (Technavio, 2016).
PLANO SUNGLASSES

Plano sunglasses are defined as sunglasses that are fitted with non-prescription lenses, and thus are not used for vision correction. They are mainly used for aesthetic purposes and for protecting the eyes against harmful ultraviolet (UV) rays. In recent years scientific studies has shown that exposure of the eyes to UV rays over a period of time makes them susceptible to developing a cataract and may also cause damage to the retina and, according to the American Optometric Association, these risks can be combated by wearing sunglasses with high eye protection factor (EPF). Therefore, growing awareness among the general population regarding the importance of protecting the eyes is the key driving force for the market.

Plano Sunglasses market is further segmented on the basis of product and material. On the basis of product it can be sub-segmented into non-polarized and polarized sunglasses, while based on material it can be differentiated into CR-39, polycarbonate, polyurethane and glass.

Normal non-polarized sunglass lenses only help in reducing the amount of visible light entering the eye, while polarized sunglasses are used also for improving visual acuity and enhancing vision. Actually using vertically aligned filters, unwanted horizontally polarized light is blocked and useful vertical light is allowed to enter through to the eye. Polarizing lenses are manufactured using techniques such as vacuum forming, injection moulding, and casting and they are quite expensive if compared with non-polarized ones. On the other hand lens materials include CR-39 or allyl diglycol carbonate (ADC), polycarbonate, polyurethane, and others such as glass and nylon. CR-39 is the most commonly used material, primarily on account of its durability and cost effectiveness and accounts for almost half of market share in the plane sunglasses market. Polycarbonate lenses provide superior impact resistance and are lightweight; however, they suffer from drawbacks including lower scratch resistance and reduced optical clarity as compared to other materials. Finally, despite glass lenses provide the highest optical clarity and scratch resistance, they are more expensive and are not very impact resistant.

SPECATCLES

Spectacles, or corrective lenses, are used to correct refractive errors by bending the light entering the eye in order to alleviate the effects of conditions such as near-sightedness (myopia), farsightedness (hypermetropia) or astigmatism. Another common condition in patients over forty years old is presbyopia, which is caused by the eye's crystalline lens losing elasticity, progressively reducing the ability of the lens to accommodate (i.e. to focus on objects close to the eye). Corrective lenses are made to conform to the prescription of an ophthalmologist or optometrist.
and they are typically segregated into Spectacle Frames, Spectacle Lenses, Ready-Made Reading Glasses and Sunglasses.

**CONTACT LENSES**

A contact lens, or simply contact or CL, is a thin lens placed directly on the surface of the eye. CLs are considered medical devices and can be worn to correct vision, or for cosmetic or therapeutic reasons. They offer a variety of benefits over their traditional counterparts. Advantages associated with the daily disposable modality include lesser time for building up deposits, no need for cleaning, and elimination of care solutions. When compared with spectacles, CLs typically provide better peripheral vision, and do not collect moisture (from rain, snow, condensation etc.) or perspiration; this makes them ideal for sports and other outdoor activities. Market categorization on the basis of product includes contact, Rigid Gas Permeable (RGP) or Gas Permeable (GP), soft, and hybrid lenses. RGP or GP lenses are custom-made from a rigid oxygen-permeable material and are more resistant to proteins and other deposits, making them easy to keep clean. Also, GP and RGP lenses tend to last much longer than soft contacts, reducing lens replacement costs. On the other hand soft lenses offer several advantages over their RGP counterparts such as greater comfort and flexibility. They also permit more oxygen to pass through to the wearer’s cornea and are used extensively for ametropic correction.

**OTHERS**

In addition to the standard above mentioned products a specialized branch of the eyewear industry is also involved in the production of safety frames, worn to protect the eyes during a variety of tasks. They are made with shatter-resistant plastic lenses to protect the eye from flying debris and can shield the eyes from hazardous splatters such as blood or chemicals. There are also safety glasses for welding, while nylon frames are usually used for protection eyewear for sports because of their lightweight and flexible properties. Additionally, with the technological development occurred in the last years 3D glasses have been developed as well. Actually 3D glasses create the illusion of three dimensions by filtering a signal containing information for both eyes. The signal, often light reflected off a movie screen or emitted from an electronic display, is filtered so that each eye receives a slightly different image. The filters only work for the type of signal they were designed for. Glasses can also provide magnification that is useful for people with vision impairments or specific occupational demands. An example would be bioptics or bioptic telescopes which have small telescopes mounted on, in, or behind their regular lenses. Newer designs use smaller lightweight telescopes, which can be embedded into the corrective glass and improve
aesthetic appearance (mini telescopic spectacles). They may take the form of self-contained glasses that resemble goggles or binoculars, or may be attached to existing glasses.

1.2 THE PLAYERS

From a first insight one could believe that eyewear industry’s players are the companies that produce, and in some cases, retail glasses and sunglasses. However this is only partially true. Actually eyewear companies on one side play the role of glasses producers and retailers, on the other side, almost all, can be also considered as firms operating in the luxury industry, and finally some of them are also involved in the manufacturing of optical lenses as well. This implies that the set of players operating in the eyewear industry has a double face: on one hand there are “standard” competitors (firm that produce and sell similar product) and on the other hand comparable (firm that face similar economic conditions) play a relevant role.

Taking into consideration the mere process of sun and prescription frames production and retailing Luxottica, Safilo, Marcolin, De Rigo and Marchon are the top players in the industry. In particular **Luxottica Group S.p.A.** founded in 1961 in Agordo (Belluno, Italy) by Leonardo Del Vecchio, is the undisputable market leader in the eyewear design, manufacturing, wholesaling and retailing, and owning the most famous eyewear brands, such as RayBan, Oakley, Chanel, Prada and Burberry it is the biggest player in the whole industry.

**Safilo Group S.p.A.** is Luxottica’s “rival” and the second worldwide eyewear maker and marketer. It was founded in 1934 by the Tabacchi family, in Italy. Over years has grown to become a world leader in creation, production and distribution of eyeglasses, sunglasses, sport glasses, ski masks and ski helmets, and nowadays it retails cover 39 countries. The Company can count on its brands and licensed labels portfolio that includes Carrera, Polaroid, Marc Jacobs and many others and one of the biggest chain store it owns is Solstice, which covers the U.S. market.

**De Rigo S.p.A.** is behind Luxottica Group and Safilo Group and among the brands it owns there are Sting, Police and Lozza. Additionally its licensed labels include Fendi, Pirelli and Fila and the Company’s retail network is built around General Optica with more than 200 stores around the world.

**Marcolin S.p.A.** is a small but dynamic player in the eyewear industry and it produces labels such as Ferrari, Mont Blanc and Tom Ford and sells its products through a retail network based on outlets in about eighty different countries. The Company operates also in the sport sector through its subsidiary Cébé producing ski goggles and sports eyewear and it belongs to Della Valle family, which owns a 40% of it, and Marcolin family which founded the company in 1961.
Finally, besides the four main Italian players there is the US based Marchon Eyewear, which was founded in 1983 and now among its licensed brands it can count Calvin Klein and Nike. The company has its headquarters in New York, along with offices in 18 other countries, with manufacturing in Italy, Japan, and China.

Enlarging the boundaries of the industry and taking thus into account also lenses and contact lenses manufacturers and retailers Essilor, Formosa Optical, St. Shine and Fielmann can be considered the main actors in the competitive arena.

Essilor International S.A. is a French company, engaged in the design and manufacture of lenses, under the Varilux, Crizal, Essilor and Definity brands, for all types of visual disorders including myopia, hypermetropia, presbyopia, and stigmatism. The company also engages in the manufacture and sale of optical instruments, which are mainly machines used to edge finished lenses and diagnose visual disorders. Essilor has a strategy of acquisition, across and along the value chain of glasses, of lens manufacturers, wholesalers and laboratories across its key markets. Essilor has the number one market share in almost all of the markets it operates in and in 2010 it has made a joint venture with Luxottica for the laboratory Eyebiz in Australia.

Formosa Optical is the world’s largest Chinese optical technology group and the biggest glasses/contact lenses distributor in Taiwan. Formosa principal operative core is customer service, well known as "honest service", a gift provided by the group that is a concrete idea of professional optical services accompanied with reasonable prices and quality of products, which has gained belief over years. This service provides customers with three guarantees which are "quality, technology and satisfaction". Formosa Optical is gaining various national certificates to strengthen its brand values and aim to join the world market in the future and become one of world's top three optical companies.

St. Shine was established in 1986 and listed in 2004. St. Shine is the fifth largest contact lens maker in the world, and specializes in manufacturing cast-moulding soft contact lens, including disposable and frequent replacement contact lens. St. Shine generated nearly 50% of revenue from Asia and it has a strong position in Japan, which is the second largest single contact lens market. Company’s products are less expensive and have a wider range of specialty products such as ring colour lens and cosmetic lens.

Fielmann was established in 1972 and with its 664 subsidiaries the Company is a leader in the German market (and the largest optical chain in Europe with branches in Austria, Switzerland, Poland, Luxembourg and the Netherlands. Fielmann designs, develops and produces lenses and frames, sunglasses and contact lenses, which are distributed via own Fielmann stores; it also offers
hearing aids via a shop-in-shop concept and, in particular, it is known for having signed the first deal with a public health insurance in 1981. Thus, it is classified as a producer, broker and service provider and it covers the entire chain in the optical industry. Anyway, the key element among these different activities is the supply of competitively priced lenses, giving the customer the opportunity to choose among a wide range of products.

1.3 THE HISTORY

Even though nowadays glasses and sunglasses are one of the most diffused stuffs in the world, their history and development is still something foggy. Actually there is no precise documentation stating an univocal moment in which glasses had become to be part of humans’ life. On the other hand nowadays it is quite immediate to understand the importance and the value that eyewear stuff has for humans.

BEGINNING AND EVOLUTION OF A GLOBAL INDUSTRY

Worldwide it is believed that optics began with the development of lenses by the ancient Egyptians and Mesopotamians, followed by theories on light and vision developed by ancient Greek philosophers, and the development of geometrical optics in the Greco-Roman world. The word optics is derived from the Greek term τα ὀπτικά meaning "appearance, look". Optics was significantly reformed by the developments in the medieval Islamic world, such as the beginnings of physical and physiological optics, and then significantly advanced in early modern Europe, where diffractive optics began. For instance the 13th century Venetians glass blowers are known to have produced reading stones made of solid glass that was put into hand-held, single lens-type frames made of horn or wood: these reading stones were similar to hand-held magnifying lenses of today. Additionally the oldest known pictorial representation of eyeglasses is a fresco in the Chapter House of the Dominican Monastery attached to the Basilica of San Niccolò in Treviso. It was painted by Tommaso da Modena (1325-1379) in 1352 and shows Cardinal Hugh of Provenc spectacles.
Additionally the 15th century has marked a crucial time in the development of spectacles. By the time of Johann Gutenberg’s invention of the printing press around 1450, glasses were already used by artisans as well as monks and other religious scholars. Then once books were made available to everyone, the demand and subsequent popularity of spectacles rose dramatically: the early spectacles were full of charm and rapidly became a symbol of wisdom and learning. The first rational application of glasses can be attributed to Francisco Donders, a Dutch ophthalmologist which has been the first to prescribe a pair of lenses with power correction corresponding to the visual defect. Finally the first step of glasses industrialization began in 1877 in Italy, where Angelo Frescura together with his brother and Giovanni Lozza founded the first glasses factory in Calalzo di Cadore, the centre of gravity of the modern eyewear district.

THE EYEWEAR INDUSTRY TODAY

Even though the evolution of lenses and spectacles has dealt with most world’s regions nowadays approximately the 50% of the global production of glasses and eyewear stuffs is carried out in Italy. Actually in 2015 more than 860 companies (about 650 handcrafters, 206 small-medium enterprises and 4 global leaders) with about 16,000 people employed, where focused on setting the rules for the whole global market (ANFAO, 2015). According to the ANFAO (Associazione Nazionale Fabbricanti Articoli Ottici, an association that groups most of the Italian companies operating in the eyewear industry) Italy possesses more than 70% of market share in the luxury eyewear segment and the 50% of market share in the production of licensed brands, and in that country the eyewear market accounts for $2.9 billion of production, $2.8 billions of export, $0.1 billion of import and 0.1 billion of domestic market.

Within the internal Italian market the 80% of production and turnover comes from the territories near Belluno, which consists in the Italian eyewear industrial district. Actually, in accordance with current legislation, the Veneto Region identifies 47 municipalities which define the eyewear district: 45 are located in the Province of Belluno and the remainder two in the Province of Treviso.

The term “districts” appears to have been first used by Alfred Marshall in his The Principles of Economics (1890), which describes them as a territorial concentration of numerous (small) enterprises characterized by high vertical and horizontal specialization, a dense network of social and economic, competitive and co-operative relations in which the exchange of commercial and technical information including any innovations is prompt but informal. Marshall ascribes their competitive advantage to the presence of external economies (i.e. economies linked to the environment in which the enterprise operates). These include faster dissemination of new ideas,
experience and know how thanks to geographical propinquity, cultural homogeneity, common manufacturing traditions, reduced cost of transport (and of transactions in general), and the easier access to complementary services or capabilities. Within the study of economics, the term has evolved and now implies the ways in which economic specialization arises through clustering in a particular industry-zoned urban area. Since the 1980s, the term has become connoted with an important element of dynamic industrial development in Northern Italy, where after the Second World War clusters of small and medium-sized enterprises (SME) experienced strong growth. Industrial districts in Northern Italy have a coherent location and a narrow specialization profile, e.g. Prato in woollen fabric, Sassuolo in ceramic tiles, Brenta in ladies' footwear and Belluno in glasses.

Basically the first factories producing glasses and sunglasses were born in Belluno in the late 1800s by developing the field until getting to over 1000 factories in the territory at the end of last century. The complexity of the system has counted on one side on the spread over the territory of many medium-sized enterprises, or even micro enterprises that have scored above the front of third-party work and sub-provision and, on the other side, on the rapid emergence of companies which soon took a characterization of large firms being able to establish their selves as a leader in the international market. According to Bramanti, in his “Enciclopedia delle economie territoriali” the main aspects that over years concurred to the creation of a strong competitive advantage in the eyewear industry in the territories near Belluno are:

The presence of natural resources, such as the hydroelectric power and the low cost manpower, that have widely offset the potential disadvantages coming from the uncomfortable geographical position of the district;

The tacit knowledge accumulation that over years has allowed the companies located in the district to create an unique and inimitable know-how;

Given these two sources of competitive advantage the district of Belluno has had a continuous growth until 1996 reaching a share of world production by about 50% concentrated in high-end and mid-high end range. However in the early ‘00s, it felt down in a general downturn: the crisis was primarily determined by the entry of new competitors, especially from the Asian markets, who, with their products at low cost, have posed a threat to many businesses. The crisis is still not going through Chinese competitors that, in addition to offer a low cost product, can also ensure a sufficient quality to overcome competitors. One of the most evident consequences of the crisis was the increased selection of companies: only the competitive ones have remained.
Actually within the Belluno’s eyewear cluster one can note a characteristic feature which experts call “two-speed district”: from one side it is possible to note the big firms which, with greater vertical integration and greater economies of scale, have managed to cope better with the crisis, not varying much their profits. On the other side there are many small and medium enterprises which, for the lack of adequate resources, have failed to successfully withstand the crisis. Larger companies such as Luxottica, Safilo, De Rigo, and Marcolin are those which, thanks to increased economic and financial resources, are likely to introduce themselves into a global market, also by doing acquisitions and joint ventures with foreign companies.

1.4 INDUSTRY’S EXTERNAL CONTEXT

The following analysis aims at investigate the political/legal, economic, social and technological variables that might somehow influence the eyewear industry and the companies operating in the eyewear sector.

POLITICAL/LEGAL

Political and legal influences and behaviours are somehow quite difficult to assess given the vastness of the industry and its worldwide coverage. However, what can indisputably pointed out is that at least some firms operating in this industry, hold by the big Luxottica and Essilor, seems willing to pursue a “monopoly looking strategy”. Actually it is common knowledge that Luxottica owns over the 80% of the world’s major eyewear brands and that Essilor is not far to achieve the highest possible market share. If from one side these circumstances result from the leading capacity of the firms and are generally associated to a year-by-year increase of quality of outputs and labour productivity, on the other hand these companies might enter in contrast with the laws regarding competition matters around the world. For instance, in the USA, the “United States Antitrust Law” is made by combining different Acts: the “Section 1” of the Sherman Act, 1890, declares illegal every contract, in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations. Additionally the “Section 2” prohibits monopolies, or attempts and conspiracies to monopolize. Since the Sherman Act promoted the greatest wage of mergers ever, it has been later on improved by the Clayton Act, which specifically prohibited exclusive dealing agreements and mergers achieved by purchasing financial stock. In Europe, the “European Union Competition Law” is found in the “Treaty of Lisbon” which makes illegal any anticompetitive agreement such as price fixing, dominant position and price discrimination. It also allows the European Council to govern any merger between firms through
specific regulations. It seems the industry’s leading companies are almost close to violate these rules and laws.

Taking into consideration, on the other hand, the political matters the industry and its main players seems to be in a comfortable position. Actually it is proved that the majority of revenues are collected from trade blocks, such US and EU, that are characterized by stability and that are far to suffer from deep disruptions and internal conflicts. Additionally trade restrictions and tax policies unexpected modification among these areas are not likely to be put in place. With regard to the big emerging (China, India, Brazil, Mexico, Turkey) the political situation seems to be less stable rather than in the US or EU but it is far to be believed against the business. Finally the portion of revenues and the presence of the business in the mature emerging (Singapore, Hong Kong, Malaysia, Argentina, Chile) and in the new emerging (Thailand, Vietnam, Indonesia, Colombia, Peru, Ecuador) are still limited, pooling down the possible effects of political disorders with respect to the overall business.

ECONOMIC

“Despite the cooling of the overall global luxury market, the outlook for sunglasses and eyewear, especially in emerging and developing markets, including South America and Asia, looks bright.”

GoskaKafel, Marketline.

Since 2008 the financial crisis and a fall of consumption affected mostly every developed country, but it is also true that the global eyewear industry operating among five continents has been supported by places like South Eastern Asia, Brazil, China and India that had preserved (even though slower than before, due to the strictly influence of trades with the West) a growing GDP. More in particular, in the advanced countries, while purchasing activity for general retail goods is up sharply from 2009-2011 levels, purchasing activity for the optical industry is only up moderately in response to the recent improvements in the economies. On the bright side, while the number of people increasing their purchases of optical goods and services has only increased slightly over the past year in response to changes in the economy, the number of people decreasing their purchases of optical products declined and it is at its lowest level since the beginning of “The Great Recession”.

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SOCIAL

“More affordable than a decent watch, less ostentatious than jewellery: come the summer months, a pair of cool sunglasses are the swimtrunksuited man’s best friend[...].”

Bill Prince, Financial Times.

The market of shades represents nowadays a rentable sector, due to its unlimited potential market, divided in several segments according to each demographic variable (gender, age, nationality, etc.). Furthermore one does not have to forget the emerging markets in South-Eastern Asia and South America grown up with globalized trends promoted by fashion lobbies, which aims at the middle income classes growing with occidental tastes and perception. All over the world sunglasses are thought to be “in” and “cool”, especially for teenagers. That is why people are willing to pay more for them. Movies like Top Gun have enhanced the perception of sunglasses in a lot of people’s mind and during the eighties Ray Ban’s products were the most wanted on the market because VIPs used to wear them. Nowadays someone who wears sunglasses looks more attractive, richer or younger. Sunglasses, and normal spectacles as well, have become more than a way to protect one’s eyes from the UV rays, they are worn to be giving a better, cooler look. Following this path, eyewear producers came up with lots of varieties, different colours and frames. The latest fashion points out the direction and eyewear producers make their way through customers’ needs and desires.

TECHNOLOGICAL

Recently it has been shown a very large variety of innovation such as smartphones, smart TVs and smart PC software. The acronym S.M.A.R.T means Self-Monitoring Analysis and Reporting Technology and it also refers to the way in which new products are thought and built nowadays, according to a high technology growing rate. The eyewear market keeps in touch with technology and Google is developing Google Glasses: “Google announced that they will be releasing goggles which run on the Android operating system. These goggles or smart glasses will have the ability to augment reality. This means these glasses can duplicate the surrounding environment of the user into a computer.” (Smartglasses.com, 2016). When products like Goggle Glasses will be available to be produced the eyewear companies will have to consider them some sort of substitutive product and their strategy would be either to stay out of this completely new segment or to step in and come to an agreement with Google. It is safely assumable that companies such as Google do not have the knowledge to produce a suitable, comfortable and well-designed frame for its Google Glasses and eyewear players, such as Luxottica, could be the proper partner to commercialize and launch them
on the global market. Additionally nowadays choosing the right lenses is up to a medical analysis but even who has no need of wearing glasses gets the opportunity of having a pair. Indeed, there are lenses able to filter the light and protect eyes, lenses that get darker as the sunlight becomes more aggressive and lenses that can help eyes resting while reading. Last but not least, the materials used to build the frame are changed in order to reach better results in terms of duration, comfortability and ecology. Plastic frames are made of Xylonite, which is very lightweight and has a large variety of layered colours, or Nylon, which happens to be really strong and lightweight. Metal frames (titanium or beryllium) are also very common between customers’ choices for they are lightweight, strong and corrosion resistant.

1.5 INDUSTRY’S INTERNAL CONTEXT
The internal context of an industry and its inner level of competition, and thus its profitability, can be investigated through the analysis of the so-called “Porter’s Five Competitive Forces”. These forces are drivers that determine in the long run the industry’s and companies’ possibilities under a certain competitive pressure. The particular influence of each of these five forces changes in accordance to the business structure and the economic and technical characteristics of the sector. More in particular three out of five forces (current competition, potential competition and substitutive products) can be seen as “horizontal” since they take place at focus company’s level, while the remainder two (bargaining power of customers and bargaining power of suppliers) can be considered as “vertical” since they act on the focus company’s Supply Chain.

CURRENT COMPETITION
As highlighted in the paragraph 3.3 the eyewear industry is wider than what could appear from a first insight. It results that the potential competition might come from different sources and may be driven by different aspects. However it is also true that eyewear players’ missions generally deal especially with the production and the distribution of sun and prescription eyewear of high technical and stylistic quality rather than the production of lenses or low-end style frames. As a consequence it is possible to partially narrow the focus down and consider as competitors only the companies that operate in the high end market, design and produce frames rather than lenses and have their own retailers. It results that Luxottica Group S.p.A., De Rigo S.p.A., Safilo Group S.p.A. and Marcolin S.p.A. are the set of companies in direct competition among each others. All of these have high installed capacity to be producing large volumes and keeping the costs low, plus almost all are vertically integrated (they produce, store, transport, wholesale and retail). This, together with the fact that there are only a few real current competitors in the whole market, throws the basis for an
oligopoly market form. Oligopolists are able to accord on prices and many other things that can reduce the competition and lead to higher costs for customers. This could be the reason why luxury sunglasses cost so much and it might become a serious threat for buyers. Furthermore they all came from the same region, Veneto, on the northeast of Italy, which can be considered as a Porterian cluster in the eyewear industry. On the other hand the relative size of the above mentioned companies is quite different: Luxottica’s critical mass greatly exceeds the others’ one resulting in a market dominated by a major firm that is followed by a set of three to four additional strong players.

**POTENTIAL COMPETITION**

An attractive market usually has high entry barriers and a few competitors. This is the first aspect to analyse in the eyewear market: entry barriers. A potential competitor may find this market very profitable since margins tend to be high when producing and selling sunglasses and spectacles but, on the other hand there are running companies like Luxottica Group and its competitors. These companies exploit scale economies, achieved thanks to a worldwide operating industry, and a position of advantage on experience curves, gained due to a several years experience in this sector. It is rather impossible for a new entry to compete with such companies in a short-medium range. Luxottica owns many firms and producers, plus it has the largest retail network in the market and it should not be forgotten that it has been working for around fifty years now. A potential competitor that would prove its strength and knowledge by opening a door for itself in the eyewear market would be bought by Luxottica Group as soon as it shows like a menace (as far as it is not a “diversification venture” of another big firm). In conclusion, this is a high profit margin market with a few current competitors but it is real tough to go through its entry barriers and properly compete.

**SUBSTITUTIVE PRODUCTS**

As far as the eyewear market goes there are no real substitutive product menaces, apart from refractive optical surgery and contact lenses (business Luxottica and few other players already operates in). Prescription glasses and sunglasses are much differentiated and the global market opportunities are growing fast but there is no substitutive product able to replace them so far. There are people who need spectacles for they can’t see properly and people who want to wear sunglasses for many reasons, but there is no demand for any other product different enough to be considered a substitute for glasses.
BARGAINING POWER OF SUPPLIERS

Given most eyewear companies’ business model characterized by a strong vertical integration the role of suppliers can be considered as marginal. It is true that these companies need to find excellent raw material and/or components producers or service providers (for instance in Logistics) but it is also true that their dimensions and production volumes are generally too huge to let suppliers have room for bargaining. Additionally the degree of customization of components and services, apart from few occasions, can be considered as not so vast and this creates the opportunity for eyewear players to preserve a quite large supplier base helping them in keeping a strong bargaining power during negotiations.

BARGAINING POWER OF BUYERS

The bargaining power of buyers is really low in this market. First of all the product is highly differentiated: the firm or licensed label on it plays a key role in its price definition. Main eyewear brands are owned by four/five producers, which rise their bargaining power to the buyers’ detriment. This is true especially in the B2B market: single opticians and optical chains are required to deal with few players in order to hold on their store an attractive showcase and portfolio of brands. Furthermore, to generate consistent sales volume, they must have in stock the most popular brands; however these brands are licensed or directly owned by one single player at a time reducing thus buyers’ bargaining power. Last but not least, these companies have their own retail networks, another variable which brings up the prices and reduces B2B buyers’ bargaining power.

1.6 FUTURE TRENDS

The global eyewear industry growth is expected to intensify during the next years and it has been estimated to reach about $140 billion by 2020. Actually it is expected that the eyewear market will benefit not only from increased awareness of the dangers of UV exposure but also from frames and sunglasses being increasingly perceived as fashion products. Additionally in the developed countries high growth opportunities are expected for the eyewear market due to: aging population (eyesight deterioration) that requires people to buy lenses with high value added (e.g. progressive lenses); changes in lifestyle that deteriorates the sight (e.g. increasing computer use) or necessitate new technologies in sport (e.g. polarized lenses) or new technologies in general (e.g. 3D glasses). Moreover, consumers, especially the younger generation, are likely to try out new products as long as they provide real added value and contribute to their quality of life; and, with a higher percentage of population being able to afford luxury goods, increasing disposable income is a major driving
force for the expansion of the eyewear market. And then there is the digital opportunity. Due to the product’s small size and one-size-fits-all model, eyewear is well-suited to digital retail, creating further opportunity for growth. For instance Luxottica has acquired in 2014 Glasses.com, an advanced digital environment with a proprietary virtual try-on technology: the technology, that uses a 3-dimensional image of the consumer’s face, allows the consumer itself to try glasses with real likeness enabling to see how the frame fits the face features in detail from multiple angles. In addition, in the same year, Luxottica again has built the Ray-Ban digital sales platform. Tapping into the current consumer trend for customisation, the platform allows consumers to choose any combination of lens, frame style and colour. The Company has seen that service has been doubling year-on-year, starting from a relatively low base and small numbers, but it is developed enough to understand the potential of that channel. In the future years additional technological improvements are expected by all the major competitors creating the possibilities for a kind of revolution in the industry.

In addition to the main trends that might take place at the market level, the industry may be shaken by a new entrant: Kering. The current size of the Kering brands’ business is roughly €350 million, making the Company one of the top five players in the industry. Kering has planned to fully control the eyewear value chain, from design to product development and supply chain, and from branding and marketing to sales. However, it is true that its scale is significantly smaller than that Luxottica’s and Safilo’s ones and that, at least in the short-medium term, the Company will operate at a commercial and distribution cost disadvantage versus the others. Indeed, although Kering has a global network of stores (respectively, Gucci and Saint Laurent had 408 and 91 mono-brand points of sale in 2014), it pales in significance compared to the own-retail network of Luxottica. In the unlikely event that Luxottica, the largest eyewear retailer in the world, stopped buying Kering eyewear, Kering would lose key distribution points, especially outside of its own stores in North America. The question to which Kering should answer is what could a new entrant into the market offer that will allow that company to enter the market without a return for the people who they are going to be competing with.

On the other hand, to inhibit market growth there could be the increasing acceptance rate towards refractive surgeries and treatments: as these methodologies provide a complete alternative to the usage of corrective eyewear products and require a one-time investment omitting periodic expenses of eyewear and eye care products the market might suffer from a new and bizarre sort of substitutive product.
2. LUXOTTICA

Luxottica Group is the market leader in the design, manufacture and distribution of fashion, luxury, sports and performance eyewear. Founded in 1961 by Leonardo Del Vecchio, Luxottica is a vertically integrated organization whose manufacturing of sun and prescription eyewear is backed by a wide-reaching wholesale organization and a retail network located mostly in North America, Latin America and Asia-Pacific. Product design, development and manufacturing take place in Luxottica’s six production facilities in Italy, three factories in China, one in Brazil and one facility in the United States devoted to sports and performance eyewear. Luxottica also has a small plant in India serving the local market. In 2014, the Group’s worldwide production reached approximately 83 million units. Additionally the Group’s wholesale distribution network covers more than 130 countries across five continents and has approximately 50 commercial subsidiaries providing direct operations in key markets.

2.1 HISTORY

The development of a vertically integrated business model passed through several phases:

- **INCORPORATION**: Luxottica was founded by Leonardo Del Vecchio in 1961. The Company started out as a small workshop and operated until the end of the 1960s as a contract producer of dyes, metal components and semi-finished goods for the optical industry. It gradually widened the range of processes offered until it had an integrated manufacturing structure capable of producing a finished pair of glasses. In 1971, Luxottica’s first collection of prescription eyewear was presented at Milan’s MIDO (an international optics trade fair), marking Luxottica’s definitive transition from contract manufacturer to independent producer.

- **EXPANSION IN WHOLESALE DISTRIBUTION**: in the early 1970s, the Company sold its frames exclusively through independent distributors. In 1974, after five years of sustained development of its manufacturing capacity, it started to pursue a strategy of vertical integration, with the goal of distributing frames directly to retailers. The first step was the acquisition of Scarrone S.p.A., which had marketed the Company’s products since 1971 bringing with it a vital knowledge of the Italian eyewear market. Luxottica’s international expansion began in the 1980s with the acquisition of independent distributors and the formation of subsidiaries and joint ventures in key markets. Luxottica’s wholesale distribution expansion focuses on customer differentiation, customized service and new
sales channels, such as large department stores, travel retail and e-commerce, as well as continuous penetration into the emerging markets.

- **EYEWEAR, A NEW FRONTIER OF FASHION:** the acquisition of La Meccanoptica Leonardo in 1981, the owner of the Sferoflex brand and of an important flexible hinge patent, enabled the Company to enhance the image and quality of its products and increase its market share. From the late 1980s, eyeglasses, previously perceived as mere sight-correcting instruments, began to evolve into “eyewear”. Continual aesthetic focus on everyday objects and designers’ interest in the emerging accessories industry led Luxottica to embark on its first collaboration with the fashion industry in 1988 by entering into a licensing agreement with Giorgio Armani. The Company followed that initial collaboration with numerous others and with the acquisition of new brands, gradually building the current world-class brand portfolio and thereby increasing its commitment to research, innovation, product quality and manufacturing excellence. Over the years Luxottica has launched collections from names like Bulgari (1997), Chanel (1999), Prada (2003), Versace (2003), Donna Karan (2005), Dolce & Gabbana (2006), Burberry (2006), Ralph Lauren (2007), Paul Smith (2007), Tiffany and Co. (2008), Tory Burch (2009), Coach (2012), Starck Eyes (2013), Armani (2013) and Michael Kors (2015).

Moreover, in 1999 Luxottica acquired Ray-Ban, one of the world’s best-known sunglasses brands. Through this acquisition the Company obtained crystal sun lens technology. In 2007, Luxottica acquired California-based Oakley, a leading sport and performance brand, which owned the Oliver Peoples brand and a license to manufacture and distribute eyewear under the Paul Smith name. At the time of the acquisition, Oakley had its own retail network of over 160 stores.

In 2013, Luxottica acquired Alain Mikli International, a French luxury and contemporary eyewear company, which owned the Alain Mikli brand and the Starck Eyes license. As a result of the acquisition, Luxottica strengthened both its luxury brand portfolio and prescription offerings, which now include Alain Mikli’s distinctive designs.

- **EXPANSION IN RETAIL DISTRIBUTION:** in 1995, Luxottica acquired the United States Shoe Corporation, which owned LensCrafters, one of North America’s largest optical retail chains. As a result, Luxottica became the world’s first significant eyewear manufacturer to enter the retail market, thereby maximizing synergies with its production and wholesale distribution and increasing penetration of its products through LensCrafters stores. Since 2000, Luxottica has strengthened its retail business by acquiring a number of chains, including Sunglass Hut (2001), a leading retailer of premium sunglasses, OPSM Group
(2003), a leading optical retailer in Australia and New Zealand, and Cole National (2004), which brought with it another important optical retail chain in North America, Pearle Vision, and an extensive retail licensed brands store business (Target Optical and Sears Optical). In 2005, the Company began its retail expansion into China, where LensCrafters has become a leading brand in the country’s high-end market. In the same year, the Group also started to expand Sunglass Hut globally in high-potential markets like the Middle East, South Africa, India, Southeast Asia, Mexico, Brazil and Europe. In 2011, Luxottica started its optical retail expansion in Latin America by completing the acquisition of GMO, a leading retailer in Chile, Peru, Ecuador and Colombia.

2.2 BUSINESS MODEL

One of the competitive advantages underpinning the Group’s past and future successes is the vertically integrated business model that Luxottica has built over the decades.

The Group’s present structure, covering the entire value chain, is the result of a far-sighted choice made by the Company’s founder and current Chairman, Leonardo Del Vecchio, who understood the potential of a vertical integration strategy when he decided to make entire frames rather than just components. Vertical integration of manufacturing was gradually accompanied by the expansion of distribution, first wholesale and, from 1995, retail and by the creation of a key presence in the high value-added business of lens finishing.

Over decades, the Company has vertically integrated all phases of the production process to attain a level of efficiency in line with the quality of products and services it offers. Direct control of the entire production platform makes it possible to verify the quality of both products and processes, introduce innovations, identify synergies and new operating methods and optimize time and costs. Direct distribution enables Luxottica to offer its products in major developed and emerging markets and achieve a unique understanding of consumer needs and tastes both globally and locally. This capability is viewed as a strength by fashion houses that come to Luxottica to produce their eyewear collections and access the Group’s global and widespread distribution network.
2.3 OPERATIONS

Luxottica’s vertically integrated business model and geographically diversified manufacturing footprint have led to greater efficiency, flexibility and speed in product design, engineering, supply, manufacturing and logistics, while maintaining uncompromising quality.

DESIGN

Emphasis on product design and the continuous development of new styles are key to Luxottica’s success. During 2014, Luxottica added approximately 1,900 new styles to its eyewear collections. Each style is typically produced in two sizes and five colours.

The design of the Group’s products is the focal point where vision, technology and creativity converge. Each frame expresses Luxottica’s two core precepts: the use of innovative materials, technologies and processes, and unparalleled craftsmanship. The design process begins with Luxottica’s in-house designers who work in an environment that promotes innovation, originality and a creative process. In addition, the design team works directly with the marketing and sales departments, which monitor the demand for current models, as well as general style trends in eyewear.

After the design process has been completed, the product development process is executed through engineering, planning, manufacturing and distribution of Luxottica’s products.

PRODUCT DEVELOPMENT

The engineering process consists of the product development stages between style sketches and the manufactured final products. By using a launch calendar that focuses on customer and geographic demand, the engineering department has been able to decrease product development timelines in recent years.

The research and development efforts of Luxottica’s engineering staff play a crucial role in the development process. Engineers are continuously looking for new materials, concepts and technology innovations to apply to products and processes in an effort to differentiate them in the eyewear market.

During the initial phase of the development process, the prototype makers transform designs into one-off pieces, crafted by hand with meticulous precision. Once developed, they are passed on to the product department, which uses visual rendering and 3D software to analyse the necessary steps to bring the prototype to mass production. At this point in the cycle, the mold workshop designs and assembles the equipment needed to make the components for the new model. The first samples are assembled and undergo a series of tests required by internal quality control procedures.
MANUFACTURING

In 2014, Luxottica’s manufacturing facilities, located in Italy, China, India, the United States and Brazil, produced a combined total of approximately 83 million prescription frames and sunglasses.

Six manufacturing facilities are located in Italy and these represent the 43% of global production output. Five facilities are located in North-eastern Italy (Agordo, Sedico, Pederobba, Cencenighe, Rovereto), where most of the country’s eyewear industry is based, and one is located near Turin (Lauriano). Over the years, the Group has consolidated its manufacturing processes and allocated specific production roles and technologies to each plant. This has enabled Luxottica to improve both the productivity and quality of its manufacturing operations.

The three manufacturing facilities in China (Dongguan) and a small plant in India (Bhiwadi) collectively represent another 43% of total production output. From 1998 to 2001, Luxottica operated the Dongguan plant in China’s Guangdong province through a 50%-owned joint venture (Tristar Optical Company Ltd.) with a Japanese partner. In 2001, Luxottica acquired the remaining 50% interest in this Chinese manufacturer and in 2006, it increased its manufacturing capacity in China through the construction of a new manufacturing facility to produce both metal and plastic frames. With the opening of this new facility, the annual average daily production in China increased by approximately 80% from 2005 to 2006. In 2010, its Tristar facility started producing plastic sun lenses to be paired with frames manufactured in the same location. In 2013, Luxottica integrated into its manufacturing processes a newly developed state-of-the-art plant, partly dedicated to decorations, utilizing techniques adapted from other industries.

Figure 4 – Luxottica’s production footprint
The Foothill Ranch facility in California manufactures high-performance sunglasses, prescription frames and lenses and assembles most of Oakley’s eyewear products. Oakley apparel, footwear, watches and certain goggles are produced by third-party manufacturers.

The manufacturing facility in Campinas (Brazil), acquired in January 2012, produces both plastic and metal frames for the Brazilian market. In September 2012, Luxottica launched the first locally designed and produced Vogue Eyewear collection for this market. Between 2013 and 2014, the Company added the production of select Ray-Ban, Arnette and Oakley collections. In 2014, the Campinas plant produced approximately 50% of the eyewear sold by Luxottica in the Brazilian market.

LOGISTICS

The Group’s distribution system is globally integrated and supplied by a centralized manufacturing programming platform. The network linking the logistics and sales centres to the production facilities in Italy, China, the United States and Brazil also provides daily monitoring of global sales performance and inventory levels so that manufacturing resources can be programmed and warehouse stocks re-allocated to meet local market demand. This integrated system serves both the retail and wholesale businesses and is one of the most efficient and advanced logistics system in the industry with 18 distribution centres worldwide, including 11 in the Americas, 5 in the Asia-Pacific region and 2 in Europe, which have allowed the Group to reduce worldwide logistic lead time year after year.

The Luxottica’s logistic network is composed by two extremely integrated echelons. In the first one there are three main distribution centres (hubs) located in strategic Group’s major markets: Sedico (Italy), Ontario (US) and Dongguan (China). They operate as centralized facilities thanks to a highly automated order management system, servicing other Group distribution centres or, in some markets, shipping products directly to customers, thereby further reducing delivery times and keeping stock levels low. The second echelon consists instead in 15 secondary distribution centres spread all over the world.
The Sedico hub was opened in 2001 and is one of the most technically advanced in the industry. In 2014, it managed approximately 20,000 orders per day, including eyeglasses and spare parts. Sedico ships approximately 210,000 units daily to customers in Europe, Middle East, Africa, selected US markets and to the Group’s distribution centres in the rest of the world, where they are then shipped to local customers. In addition, Sedico manages customized services, such as Ray-Ban Remix, providing direct global deliveries.

The Dongguan hub was opened in 2006 and manages an average of 170,000 units per day. The growth in the Asia-Pacific region has made this hub a strategic part of the Group’s distribution network.

**BRAND PORTFOLIO**

Luxottica’s brand portfolio is one of the largest in the industry and continuously evolves, with major global brands backed by leading brands both at a regional level and in particular segments and niche markets.

The presence of Ray-Ban, one of the world’s best-selling brands of sun and prescription eyewear, and Oakley, a leader in the sport and performance category, gives the proprietary brand portfolio a strong base, complemented by Persol, Oliver Peoples and Alain Mikli in the high-end of the market, Arnette in the sport market, and Vogue Eyewear in the fashion market. Alongside the proprietary brands, the portfolio has over 20 licensed brands, including some well-known and prestigious names in the global fashion and luxury industries.
PROPRIETARY BRANDS
In 2014, proprietary brands accounted for approximately 69% of total sales of frames. Ray-Ban and Oakley, the two biggest eyewear brands in Luxottica’s portfolio, accounted for 27% and 11.7%, respectively, of the Group’s 2014 net sales.

LICENSED BRANDS
Designer lines are produced and distributed through license agreements with major fashion houses. These agreements are exclusive contracts which typically have terms of between four and ten years, and may contain options for renewal for additional periods. Under these license agreements, Luxottica is required to pay a royalty ranging from 6% to 14% of the net sales of the related collection and a mandatory marketing contribution of between 5% and 10% of sales.
Prada is the most significant license in Luxottica’s portfolio as measured by total sales. In 2014, sales realized through the Prada, Prada Linea Rossa and Miu-Miu brand names together represented approximately 4% of total sales.

DISTRIBUTION
Luxottica’s global distribution network is one of the Group’s core strengths. It includes retail stores as well as a wholesale network of third-party stores and chains. Luxottica operates in all the world’s major markets and continues to expand in emerging markets, where it has made substantial investments over the last few years and intends to broaden and strengthen its distribution platform going forward. The Company furthermore exploits three main channels of trade:
• **WHOLESALE**: The wholesale distribution structure covers more than 130 countries, with approximately 50 commercial subsidiaries in major markets and approximately 100 independent distributors in other markets. Wholesale customers are mostly retailers of mid to premium-priced eyewear, such as independent opticians, optical retail chains, specialty sun retailers, department stores and duty-free shops. The Group is currently seeking to further exploit new channels of distribution, such as department stores, travel retail and e-commerce. Certain brands, including Oakley, are also distributed to sporting goods stores and specialty sport stores, including bike, surf, snow, skate, golf and motor sport stores.

• **RETAIL**: With a strong portfolio of retail brands, Luxottica is well positioned to reach every segment of the market. The retail portfolio offers a variety of differentiation points for consumers, including the latest designer and high-performance sun frames, advanced lens options, advanced eye care, everyday value and high-quality vision care health benefits. As of December 31, 2014, Luxottica’s retail business consisted of 6,471 stores and 613 franchised locations. Luxottica’s retail stores sell not only prescription frames and sunglasses that the Group manufactures but also a wide range of prescription frames, lenses and ophthalmic products manufactured by other companies. In 2014, net sales comprising Luxottica’s proprietary and licensed brands represented approximately 89% of the total net sales of frames by the Retail division.

• **E-COMMERCE**: Luxottica’s e-commerce strategy is to enter additional markets as the business matures; for instance Oakley, Ray-Ban and Sunglass Hut e-commerce websites serve as important sales channels that complement Luxottica’s retail operations and wholesale distribution. The websites drive brand awareness and allow consumers to purchase products efficiently, extending superior customer service into the digital space. Additionally, in 2014, Luxottica acquired Glasses.com, an advanced digital player in North America’s eyewear industry. Glasses.com developed an exclusive virtual mirroring
technology, accessible through smartphones or tablets that uses a 3D image of the user’s face to allow for multiple try-on options with real likeness.

2.4 INTERNAL ANALYSIS

Given Luxottica’s characteristics reported in the paragraphs above it is possible to conduct an internal analysis about Company’s Resources and Capabilities. Company’s internal status can be then compared with the general state of the eyewear industry in order to assess the final positioning of Luxottica.

RESOURCES

The resources are tangible and intangible assets a company can count on when defining its comparative advantage strategy. They can be classified into the following different categories in order to be deeply analysed.

TANGIBLE RESOURCES

Tangible resources are the resources that can be quantified. They are:

- **Financial Assets**: Luxottica Group’s incomes are way higher than its competitors’. In addition, it also has a better EBITDA % of its total income which means the company is leading the market in keeping low costs, exploiting economies of scale, profitable geographic areas and thus making the best earnings out of its sales. In conclusion there is a need to say that the great earnings of the Company can be also explained by the pieces Luxottica is able to set given its high-end brand portfolio. There is, indeed, an outstanding margin between the production cost and the price of a pair of glasses, especially for luxury eyewear.

  The rating company Standard and Poor’s rates Luxottica’s bonds better than its competitors, making it easier for the company to get money on the financial markets (New York Stock Exchange since 1990, Borsa Valori di Milano since 2000):

  - Luxottica Group Financial Rating SP’s: [BBB+] (Reuters, 2016);
  - Competitors’ Financial Rating SP’s : Safilo Group: [B]; Marcolin: [B] (Reuters, 2016)

- **Physical assets**: Luxottica Group has controlled since 2001 its global demand with three main distribution centres (hubs) situated in strategic positions in order to better serve the major markets and achieve a proper level of flexibility. These hubs are placed in Sedico
(Italy), Ontario (US), Dongguan (China). The hubs serve more than 50,000 orders per day, the biggest one in Sedico counts 210,00 units shipped per day, and they are all integrated with SAP system (System Application and Products in data processing) which optimizes inventory control, order management process and manufacturing management, allowing an higher level of efficiency and lower logistic costs. These facilities allowed Luxottica to change an old local warehouse system of serving in order to improve speed and efficiency both in mature markets, such as Europe and North America, and in developing ones like Brazil, China, India, and Mexico. The Group has an outstanding retaliatory capacity as well. Since the 2001, when Luxottica acquired Sunglass Hut, it has become the leader of sun retail business. Its network consists of more than 6,000 corporate stores of several brands all over the world operating in optical and sun and luxury retail.

INTANGIBLE RESOURCES

Tangible resources are the resources that are unable to be quantified. They are:

- **Technological Assets**: Luxottica Group owns many brands and licensed labels and has an efficient retaliatory capacity that counts many stores and shops. The company is developing new features and designs for its products to make sure they are going to be leading the worldwide sales:
  - Balance of iconic and casual styles;
  - New materials & techniques: carbon fibre, titanium hinges, aluminium;
  - Line extensions that reach new customers;
  - Styleswitch – first lifestyle product with Switchlock technology;
  - Crosslink Switch – interchangeable lens carrier technology;
  - Lens storytelling for different environments. The Snow/Skiing market segment has been growing fast and full of opportunities lately. That’s why Luxottica Group has been developing high technological products in this direction as well, starting from the Airwave snow goggle with heads up display which integrates the Bluetooth connectivity, GPS and RFID;

- **Reputation Assets**: Luxottica Group exploits the consumer’s awareness to the brands it owns or has licensed labels on. The most known brands among the Group’s portfolio are RayBan, Persol and Oakley. They also have lots of famous stylists and fashion brands’ names among their licensed labels. The most important are the following: Bulgari,
Dolce&Gabbana, Armani, Chanel, Burberry, Miu-Miu, Prada, Ralph Lauren, Tiffany and Versace.

- **Human Resources**: “People working in Luxottica know they are part of something unique. Team spirit is a founding value that enables everyone to progress in their work thanks to a positive and supportive environment.” (Luxottica website). Luxottica Group counts more than 70,000 employees. More than half of them (64.5%) operates in the retail business, only a few (10%) work in the wholesale segment and around 17,600 employees (25%) work in manufacturing activities and logistics. Management and Directory services represent 0.5% of the total. In terms of the geographic distribution, 58% of employees are in North America, 14% are in Europe, 21% are in the Asia-Pacific area and Latin America increased to 6% in the last years.

Luxottica Group investments focused especially on Singapore, where the company is looking forward to establish a “shared service centre” in order to support local markets and improve its sales in Malaysia, Indonesia and Thailand, which are fast growing markets that offer many profitable possibilities. In 2012 the company participated to a global employee engagement survey, in which recorded a 88% participation index, according to an attendance of more than 55,000 employees.

Luxottica Group is also working on some technological projects:

- The operational Platform has been further increased in 2012 with the full management integration of all regional units, both in manufacturing and logistics;
- The Lean System program allows the company to reach high quality, speed and production flexibility;
- The “Zero Accidents” program that has given appreciable results improving security standards;
- The e-commerce areas have been improved;

**CAPABILITIES**

Some assets have to be working together in order to obtain sustainable competitive advantages, known as Capabilities. Thanks to its available financial resources and to its vertical integration purposes, the direction function of Luxottica developed an excellent strategy based on acquisition management. This capability led the Company outside the country borders to the global market where it started buying other brands with an aggressive approach and established retail stores and shops in foreign countries in order to conquer emerging markets and different geographic areas.
Fabrication and logistic efficiency are obtained thanks to its physical assets: hubs, which are facilities, used to store and organize products. This capability enables Luxottica to react fast and in a flexible way to demand’s changes and work after-sale services better (e.g.: shipping of spare parts).

Marketing and Brand management are as well very important for Luxottica, due to its differentiation business policy. The company only promotes its brands not the company itself, that is why it is important to have a very well organized Marketing function and a detailed Brand Management.

All these factors together throw the basis for sustainable comparative advantages. The leadership position in the market that the company has gained is the result of the deep integration of these capabilities. Leonardo del Vecchio (Luxottica chairman) and the two CEOs play a critical role in the company’s strategy since they are the only ones able to coordinate resources worldwide and control the market leadership over the years by managing established markets and conquering emerging markets.

2.5 STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS

The following analysis will be devoted as a recap of what has been mentioned about the Company in the paragraphs above and it will summarize Luxottica’s strengths and weaknesses pointing out market’s opportunities and threats as well.

STRENGTHS

- **Vertical integration**: Luxottica’s structure covers the entire chain of value to offer a quality in product and services. The Company has managed to build an agile organizational structure, avoiding the risks and problems typically associated with the bureaucratization of large organizations, without losing the advantages of a small enterprise;

- **Dedicated distribution channel**: For fast service and cost optimization, the Company has divided the distribution in 3 main centres (hubs) in strategic locations serving the major markets: Sedico in Europe, Ontario in US and Dongguan in the Asia-Pacific region. The SAP system provides daily monitoring of global sales performance and inventory levels so that manufacturing resources can be programmed and warehouse stocks reallocated to meet local market demand;
• **Brand portfolio:** The company has a solid brand portfolio and its brands are known in the world for quality, design and fashion. Luxottica has 12 house brands (like Ray-Ban, Persol, Oakley, Vogue, etc.) and 22 license brands (like DKNY, Chanel, Tiffany & Co. and many others). Brand portfolio helps the company to strengthen its reputation and to achieve client loyalty and attract new customers;

• **Quality:** “Hand made in Italy” is a symbol of quality in the world. The technology and the R&D are continually being developed to achieve new level of customer satisfaction;

• **12 plants:** Luxottica has 6 plants in Italy, 2 in USA, 2 in China, 1 in India and 1 in Brazil to ensure excellence in quality, technology and product differentiation;

• **Retail network:** The retail network reaches many markets and covers most of the geographic areas of interest for Luxottica. Additionally through STARS, a project in which retail enters in wholesale division, Luxottica has created a sophisticated distribution approach which provides clients with an excellent service;

• **Eyewear market:** prescription frames and lenses most of all has an inelastic demand which is expected to rise up according to demographic growth tends;

**WEAKNESSES**

• **Luxury eyewear based:** Luxottica Group is well positioned in the luxury market, thanks to the high quality of products and their innovative design. Their lines are suitable for developed markets like Europe and the United States, but not for new economies such as Brazil, Mexico, China and India where the GDP per capita level is not very high;

• **Presence in fragile economies:** From 2004 to 2010 Emerging Markets growth has been 16.35%, while growth in developing economies was only 4.94%. The developed countries from which Luxottica supply the 77% of net sales have reached a maturity stage. It seems almost impossible that a decline stage will start in the short-medium term, but the main markets are now considerable as steady;

• **GDP growth rate and future economic conditions:** Luxottica’s business is exposed to the cyclicality of demand. Given the strong positive correlation between real GDP and eyewear demand, the overall performance will suffer from economic setbacks leading to falling GDP as in the period of economic recession 2008-2009. Luxottica’s sales register a decrease of 2.06% in 2009 as the world annual GDP falls to 2.05%;

• **Currency:** The company is exposed to the weakening/strengthening of Euro versus other currencies, in particular USD, AUD and Yuan, due to manufacturing costs incurred in Euro and Chinese Yuan and revenues mostly received in USD and AUD (transaction risk).
Secondarily, there could be a gap between operating results, reported in Euro, and other budget items such as assets, liabilities, revenues and costs denominated in various currencies, which leads the company to face a translation risk. Finally, the foreign currency rate sensitivity could impact on the Group’s competitive position in a given market;

**OPPORTUNITIES**

- **Acquisition:** The Group has a good track record in managing acquisition. Luxottica proposes the purchase of new companies when it is possible to take advantage of synergies (e.g. the acquisition of Oakley which brought the know-how for the sport sector and the polarization of lenses) or to enter in new markets (as for the recent acquisition of Tecnol in Brazil). In North Europe there are companies with big market share and a big number of stores so in the next years a new deal or acquisition can be expected here or in the emerging markets in order to increase the presence of the Firm;

- **Changing in lifestyle:** The increase in television and computer use, in formal employment and female participation in the labour force in the emerging markets are all related to eyesight worsening and the consequent needs for vision correction;

- **Increasing fashion content of frames:** With the licensing of fashion design, Luxottica Group focuses on a new costumers segment that is people who consider eyeglasses and especially sunglasses more as an accessory rather than a need;

- **OneSight:** It is an opportunity to enhance Luxottica corporate image; the objective is to improve the quality of eye care by creating new partnerships to focus its resources on the areas of particular need, offering continuous assistance to patients all year round and increasing awareness of the importance of sight;

- **New Technology:** Oakley has invented the Superior High Definition Optics for world-class athletes, military, law enforcement and active consumers. Then the innovative new 3D eyewear and the AIRBRAKE™ is the world’s first snow goggle to take advantage of SwitchLock™ Technology. Additionally the partnership with Google might open the Hi-Tech market for Luxottica;

- **Web:** Luxottica is developing Ray Ban as epicentre brand with events and presence on Facebook; with the success of Sunglass.com e-commerce platform the Group expects that sales will double in the U.S. for 2016;
THREATS

- **Alternative prescription**: Luxottica profitability may be affected by a reduction of the sales of prescription glasses, lenses and accessories if consumers prefer correction alternatives to prescription eyeglasses, such as corneal implant, laser surgery or contact lenses. However, eye surgery is not a strong threat for the Group because of the high costs and the fact that people invest on more expensive sunglasses after the operation. In contrast with Fielmann and St Sunshine, Luxottica does not produce contact lenses but sells them in its stores; nevertheless, this is not a real problem because who uses contact lenses usually buys sunglasses to protect the vision;

- **License loss**: Luxottica has a strong brand portfolio, but changing in consumer preferences or in fashion could affect the value of fashion license and reduce the likelihood of favourable renegotiation of license agreement. Additionally licensed labels need to be renewed every couple of years contracting with fashion stylists and firms;
3. OBJECTIVES AND METHODOLOGIES

3.1 OBJECTIVES

The present study is intended to apply the theoretical knowledge, frameworks and models learned in the fields of Logistics and Supply Chain over a multinational context in order to, on one hand sustain the development of the business for a worldwide player, and, on the other hand, to enlarge the actual available literature generating knowledge spill-overs from a business environment to an academic one. In practical terms it means to develop a model enabling firms involved in the business-to-business markets to increase the effectiveness and the efficiency of their physical distribution system. This study actually seeks to shape a structured procedure and method to understand why and when a particular kind of customer has to be served either in a preferential or standard way both from a warehouse point of view and from the transportation perspective. Nevertheless, given the double-side analysis characterized by a literature review and by an on-field experience, the achievement of this objective naturally engenders the needs to:

- Analyse the scientific journals and papers in order to appraise the evolution of the whole research production from it early beginnings to 2015, with particular interest on themes such as Logistics Service Quality and Cost-to-Serve. Additionally, to achieve a larger picture on how scholars and academicians have dealt over years with these topics, a higher level research on how Logistics gets into contact and interacts with other companies’ disciplines is carried out;
- Analyse, through an on-field experience, how the eyewear industry leader Luxottica is coping with these themes and understand how they are addressed and managed within multinational business environments;

Once the objective related to the development of the above mentioned model aimed at addressing the right service to the right customer would be achieved its validity will be proved by applying its rules to a particular and narrow set of customers. Subsequently, if results would be promising, Luxottica’s objective is to apply it on a broader set of customers. The opportunity to enlarge the sample of customers revising the logistics services and introducing a sort of customization for them could have a strong impact on both costs rationalization and service level provision, driving toward
a higher customer satisfaction, a better consciousness on costs and a superior warehouse planning. However these objectives and their measurement is something that goes slightly beyond the boundaries of the present study for two main reasons: in one hand they have a long-term impact that would be probably impossible to become effective by the end of this research, and, on the other hand, they are supposed to influence a wide range of variables and outputs that would require a specific and dedicate dissertation.

In conclusion the present study, starting from two dedicate analysis about how literature and real-world evidence as well are dealing with the Logistics Service Quality and the Cost-to-Serve, integrates together both sources of knowledge in order to give as output a detailed procedure for customizing the service offered to business consumers.

3.2 METHODOLOGIES

The way toward the achievement of the research objectives consists in a step-by-step analysis made of five either sequential or parallel macro-phases linked each other by input-output relationships. Some macro-phases are then composed by different sub-phases, linked to input-output relationships as well. The main phases taken into consideration are reported in figure 12 and they are further analysed in the following paragraphs:

The division “comprehend the environment” is briefly discussed below and it is not going to be presented in details in further sections of the present study. Indeed only the main highlights gathered during this phase and considered useful as well essential for achieving a full and all-round understanding of this research are presented within the other sections. In so doing on one hand the readability of the research is not compromised as well as its degree of complexity is kept as adequate and, and on the other hand, relevant pieces of information are disclosed when needed in
order to enable readers to catch the big picture of the study. Additionally this initial phase, together with the “deep dive on STARS” has had the fundamental and crucial role of making it possible to assimilate what would have been the topics of the study addressing all the subsequent steps, with particular influence over the literature review. All the others sections, “literature review”, “the analysis” and “conclusion and remarks” are further discussed in dedicated sections and the related methodologies are expressed in the following paragraphs.

COMPREHEND THE ENVIRONMENT

Environment and business comprehension and mapping has been the most complex and long lasting step of the current study: throughout this phase the general rules behind Luxottica’s business model have been discovered and comprehended, and a precious set of embedded knowledge has emerged and pointed out. Actually this first phase has been intended as the opportunity and the chance to get in touch with Luxottica processes and operations, both from a practical point of view and, concurrently, from a theoretical perspective: the strict interrelation among theoretical and practical worlds has been fundamental in order to be firstly inducted on how Company’s logistics works, and then to have a real-world evidence of what learned. This particular approach, characterized by an on-field learning and training has been carried out through weekly meetings and inductions with managers, team leaders, and operators that have given an all-round perspective of the different business units within Company’s logistics.

<table>
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<tr>
<th>OPERATIONAL ACTIVITIES</th>
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<th>STRATEGICAL ACTIVITIES</th>
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<tr>
<td>SHIPPING</td>
<td>LOGISTICS</td>
<td>DISTRIBUTION</td>
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<td>PACKAGING</td>
<td>CUSTOMER SERVICE</td>
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<td>PICKING</td>
<td>TRANSPORTATION</td>
<td>NETWORK DESIGN</td>
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<td>WAREHOUSING</td>
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<td>CUSTOM PLANNING</td>
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<td>RECEIVING</td>
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Figure 13 – Luxottica’s areas touched for achieving a global comprehension

In particular, as showed above in figure 13, a backward process has been undertaken starting from the last step of the order fulfilment chain, the physical pick-up of goods by forwarders at the
warehouse dock, passing then through all the operational phases, moving toward the tactical activities, such as the transportation and warehouse short-term planning, and finally concluding with a clear explanation of the most strategical and core competence activities, such as the network development.

These kinds of on-field inductions have resulted in a sort of fly-well originating precious streams of knowledge and a virtuous cycle that has allowed to find links, commonalities and divergences between the different processes, which, in turn, have prepared the way and laid the ground for a much more deep understanding of the following phases. Practically it is not possible and fair to consider this process as definitive as well as closed since, for its own nature, it is a continuous advancement in terms knowledge accumulation.

In conclusion this long and fascinating step can be intended as the backbone of the present study, which has enabled and supported all the subsequent steps and, additionally, has been enriched during the whole appraisal of the research.

DEEP DIVE ON STARS

Alongside with the comprehension of the environment it has been necessary to deep dive on how Luxottica’s business models as well as logistics were impacting the STARS channel of trade. As it is going to be further discussed in paragraph 5, STARS is trade channel devoted to opticians with whom Luxottica has established a partnership program that allows the Company to manage an independent store as a proprietary one. Opticians joining this opportunity are particularly important for Luxottica, and exactly for this reason the Company has established a dedicated business units that over year has grown with a strong pace and nowadays is one of Luxottica’s key hearts. The strategic relevance of STARS business model is well supported by the corporate strategy that has decided to serve these opticians with the highest possible priority: logistics at first has particular and dedicated procedures and processes to assure the best possible service. This is the reason why, in addition to a general comprehension of the environment also a deep dive on this particular business model has been carried out.

The deep dive has required different meetings involving STARS dedicated teams and it has been conducted leveraging especially on theoretical concepts rather than on on-field training and experiences; in particular, most of the information have been collected in meetings held with STARS Logistics Customer Service Team and STARS Planning Team. This methodology, apparently greatly different from the one adopted for the comprehension of the environment, is justified by the nature of STARS: this particular trade channel, from an operative point of view, is fulfilled as all the other businesses are served, on the other hand it logically follows totally different
rationales. This is the reason why only tactical and strategical activities, have been impacted in this phase of the study:

Throughout this deep dive a better understanding of what STARS is has been achieved and a more detailed picture of this channel of trade has been emerged. With this superior awareness it has been possible to deploy the concepts arisen in the former step and to start, together with the results coming from the literature review, the analysis of the AS IS scenario.

LITERATURE REVIEW

The literature review phase has been conducted immediately after a sufficient comprehension of the business has been achieved. Additionally the literature has been analysed in parallel with the deep dive about STARS trade channel. This timing has been fundamental: on one hand the worthy comprehension of the environment has allowed to understand the criticalities of the business, routing the literature review over certain topics, while, on the other hand, the deep dive on STARS has permitted to refine that topics addressing the analysis of journals and papers on specific issues regarding, mainly, that part of Luxottica business.

The literature review, in fact, has helped to build a clear image on what, from a theoretical point of view, was the state-of-the art of the main topics under examination. This research acted as a fly-well providing a series of meaningful starting points on which to base the subsequent phases.
The first phases consist on papers selection and collection, while the second is focused on their classification. Then the third phase involves a brief analysis of the selected literature and lastly that is going to be greatly enlarged on paragraph 4, in phase four research gaps and potential areas for further investigation are identified.

During the literature overview two main themes have been found as key:

- The analysis of customer profitability, driven by the Cost-to-Serve (CtS) and influenced by the Logistics Service Quality;
- The analysis of the strict relationship between Logistics and Marketing;

Once introduced these themes a detailed description and development of them has been done addressing topics such as the way in which the Cost-to-Serve is defined and measured and what are its main drivers, which are the fundamental parameters considered when evaluating the Logistics Service Quality and what are the main aspects that link together two apparently distant disciplines such as marketing and logistics. The relevance of the addressed themes is disclosed for each paper in table I. These topics have been developed trying to always maintain a strict link with practice and with the business case under examination: in fact the development of the themes has been always concerned with the implications that the working experience would have. More in particular some papers have also been discussed together with managers and with some teams involved in the research in order to find commonalities between the way in which practical aspects have been discussed in literature, or, at the opposite, how theoretical dissertations may have implications for Luxottica. This exchange between theoretical and practical world has been fundamental to carry on further with a refinement of topics and for finding a fil rouge between them.

The papers review has been the initial part of the research process and has provided the basis for the following phases of the current work. The study of the current contribution allowed, on one hand, to have confirmation about the importance of the theme, and on the other hand, to highlight some gaps to be deepened and analysed in this work and to sharpen the objectives of the study. Gaps have been detected comparing what has been developed over years in literature with what has been practically applied in Luxottica without being formalized in theory. To find gaps papers have been examined firstly by looking at the introduction section, which has been found to always deploy a sentence or more about the reasons why that research is done, at the conclusion and at the suggestions for future research section in which the authors of articles, having examined the literature and having conducted a research themselves, would point their readers to areas which lack investigation or need closer examination. Additionally some systematic reviews have been analysed: these papers
delved deep into the literature and examine the trends and changes in a discipline or specific field of study and providing summaries of the literature.

THE ANALYSIS

The analysis of the STARS business has been subdivided in two main steps:

- **AS IS scenario analysis**, through which the actual way in which business was conducted has been highlighted;
- **Insights for improvement**, through which the possible main improvements to reinforce and enhance the business have been pointed out;

AS IS SCENARIO

The AS IS scenario analysis has been characterized by one major objective: apply both the practical and the theoretical learnings gathered in the three previous phases in order to map how the STARS business is conducted. In order to achieve such objective it has been necessary to define a methodology helping to slightly reduce the complexity of the business. A twofold approach has been evidenced and used: firstly a perimeter has been defined and secondly the parameters on which to base the analysis have been identified.

- The **perimeter definition** consisted in the first opportunity to reduce the complexity of the analysis. Actually, being STARS trade channel developed in more than 50 countries all over the world and counting thousands of partners worldwide, it would have been particularly difficult to analyse in a one-shot study all the geographies, even because to different geographies may correspond different rationales. As a consequence the perimeter has been drafted under both a timing and a geographical perspective, with the objective to craft a homogenous and well balanced set of markets and to be able to analyse data relative to 2015. One of the instruments utilized in order to carry out such fine-tuning consisted in the weighted score point technique, however in these steps not only quantitative, but also qualitative variables has been assessed. Finally the last refinement has been driven by the STARS classification;
- The **parameters definition** gave the chance to identify which KPIs would have been later applied and utilized in order to assess the performances of the business. The literature
review have played a relevant role acting as a font of knowledge and actually two of the most important KPIs drown during the analysis of the literature have been selected. The selection criteria and process have been clearly pointed out and it is widely described in section 5.

Given the perimeter and the parameters the analysis of the AS IS scenario has been pointed out. In this phase the theoretical concepts highlighted through the literature review have been applied to the real world, involving a quite complicated effort: the level of complexity embedded in Luxottica was much higher in respect to the concepts pinpointed in literature. In fact the number of leverages, variables and exceptions managed within the Company has required a strong determination for the understanding of which KPIs would have represented the best the actual set-up. Even though the set of parameters evidenced during the literature review was broad and complete, the introduction of a new KPI has been necessary in order to reach the scope of the project. As a consequence, after a methodological study with managers and team leaders there has been the need to develop a brand-new framework, the so-called Order to Delivery Lead Time calculation model, that enabled to measure Luxottica’s Lead Time to customers.

The methodology that led to the analysis of the AS IS scenario has been reinforced with a preliminary summary of the main gaps giving a full perspective of the current way in which the Company was leading its business.

INSIGHTS FOR IMPROVEMENT
During the analysis of the AS IS scenario a critique and reviewing approach has been implemented: every variable that was considered not fully and optimally operational within the AS IS scenario has been widely discussed and enhanced. This continuous deep dive has been supported by a twofold trial-and-error process: the choices on how to improve the current set-up have been firstly looked and discussed with the Logistics Customers Service team that during the whole duration of the project has acted as a link between Transportation and STARS Planning, in a weekly review. Additionally a bi-weekly review with STARS business owners has been regularly carried out in order to validate the improvements and to freeze the findings. The implementation of the TO BE scenario has been partially possible: in order not to disrupt the business it has been necessary to find the right moment in which to make the innovations applicable. As a consequence together with the STARS Planning Team and with the STARS Logistics Customer Service Team some meetings have been held and the final decision has been also validated both by Sedico DC manager and by the Logistics Network manager.
CONCLUSIONS AND REMARKS

Once the main highlights and the most important insights for improvements have been collected and practically applied, a brief section pointing out the overall conclusion of the present study and its main points of attentions for future research paths is then depicted.
4. LITERATURE REVIEW ABOUT LOGISTICS CUSTOMER SERVICE

The literature review consists of the all-round appraisal of the contributions related to the main topics touched within the study. The systematic examination of the published papers has allowed accumulating precious knowledge about the research theme and making the point about the state of the art in the field of research. The literature review has also helped to point out what are the main gaps between the best performing institutions and the Company under examination. Moreover this first step has acted as a fly-wheel for collecting new ideas and for sharpening the objectives of the research.

The section is organized as follows. The next paragraph points out the way through which papers have been selected and collected, and subsequently, in the second paragraph, how they have been classified. Then, once the body of knowledge has been fully organized, a general overview of the results obtained by reviewing and analysing papers together with the main themes arose is presented. These general themes are consistently presented and widely discussed in the fourth paragraph. Finally the limitations of the research are identified and research gaps and potential directions for future research in this field are highlighted.

4.1 PAPERS SELECTION AND COLLECTION

Similarly to Perego et al. (2011), the preliminary point for the identification of appropriate and significant papers was a number of different library databases (i.e. Scopus, Science Direct, ISI Web of Knowledge, and Google Scholar). The search was conducted using several keywords (i.e. “Logistics,” “Eyewear,” “Cost-to-Serve,” “Clustering,” “Segmentation,” “Customization,” “Service Level,” “Supply Chain,” “District”, “Cluster”, “Performance” and “Customer Profitability Analysis”) and their combinations as well have been used in both the abstract and the main body of the papers. In order to avoid the omission of other potentially major papers, as suggested by other authors (e.g. Marchet et al., 2014), most of the cited contributions were also cross-referenced. By applying this method, it was possible to assure a satisfactory coverage of the existing body of research in the field. During the examination of the papers that were found, some were recognized to be more relevant than others for the purposes of the current study. As such, a sub-set of papers dealing with the Cost-to-Serve and the Logistics Service Quality aspects was finally selected, and 52 papers published from 1948 to 2015 were considered for in-depth investigation.
4.2 PAPERS CLASSIFICATION

Different methods used in previous literature-review papers (e.g. Carter et al., 2007; Ghadge et al., 2012; Meixell and Norbis, 2008; Natarajarathinam et al., 2009; Perego et al., 2011; Pettit and Beresford, 2009) were examined. For the purposes of this research, the selected contributions were classified based on: their main characteristics (i.e. year of publication, journal title, regions addressed), the research method(s) adopted, and their content. Table I, based on Natarajarathinam et al. (2009), summarizes the key attributes of each paper, and the research method(s) adopted. Aligned with Perego et al. (2011), the papers are listed in chronological order to show the evolution of the main themes arisen: the integration between Marketing and Logistics, the Logistics Service Quality and the developments toward the Cost to Serve and Customer Profitability Analysis. In addition to the clusters by themes, papers have been classified and evaluated as well on the basis of their research methodology. The categories used were based on a study by Meixell and Norbis (2008), who recognized seven research methods, i.e., conceptual models or frameworks, surveys, case studies, analytical/mathematical models interviews, simulations, and others. As shown in Table I, many of the papers reviewed are research papers and frameworks (31) some others are articles (8). In terms of the other methodologies, a number of papers have been found belonging to dissertation books (4), case studies and working papers (4) and then general and literature reviews (2) and others (3). The 52 papers examined were published in 39 different scientific journals, books and faculty’s presses and, in particular on logistics journals (21%), marketing journals (19%), transportation journals (4%), cost journals (2%), business reviews (10%), academic literature (6%) and others (36%).

Focusing on the year of publication, the majority of the papers are relatively recent: almost 60% has been published from 2000 on, and a huge gap in the ‘70s and ‘80s was observed, followed by a rising trend. A further increase in the number of papers occurred on 2012 and 2014, thus attesting an increase in the amount of attention being paid by the research community to these issues. Finally, looking at the regions addressed, it should be noted that the number of contributions in which the first author is from the USA is 28 (corresponding to 53%), followed by UK, Greece and China (3 each, i.e. 6%). Other publications were written by researchers from Taiwan (2), the Netherlands (2), Sweden (1), Germany (1), Belgium (1), Australia (1), Finland (1), Italy (1), Brazil (1), Denmark (1), India (1) and Poland (1). These results appear to be consistent with the attention of Marketing aspects and the development Logistics and Customer Satisfaction.
<table>
<thead>
<tr>
<th>No.</th>
<th>Author (year)</th>
<th>Country</th>
<th>Journal</th>
<th>Title</th>
<th>Research method</th>
<th>Logistics &amp; Marketing</th>
<th>LSQ</th>
<th>Cts &amp; CPA</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Culliton J.W. (1948)</td>
<td>USA</td>
<td><em>Harvard Business Review</em></td>
<td>The management of Marketing costs</td>
<td>Book</td>
<td>Ancillary</td>
<td>Absent</td>
<td>Core</td>
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<td>3</td>
<td>Stern L.W. (1969)</td>
<td>USA</td>
<td><em>American Marketing Association</em></td>
<td>Distribution channels: a social system approach to the study of Marketing</td>
<td>Research paper</td>
<td>Core</td>
<td>Ancillary</td>
<td>Absent</td>
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<tr>
<td>4</td>
<td>Peter Gilmour (1974)</td>
<td>Australia</td>
<td><em>Physical Distribution Management in Australia</em></td>
<td>Development of physical distribution models</td>
<td>Research paper</td>
<td>Ancillary</td>
<td>Ancillary</td>
<td>Absent</td>
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<tr>
<td>5</td>
<td>Peter Gilmour et al. (1976)</td>
<td>USA</td>
<td><em>Int. J. of Physical Distribution &amp; Logistics Management</em></td>
<td>Customer Service: differentiating by market segment</td>
<td>General review</td>
<td>Core</td>
<td>Ancillary</td>
<td>Absent</td>
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<tr>
<td>6</td>
<td>Lloyd M. Rinehart et al. (1989)</td>
<td>USA</td>
<td><em>J. of the Academy of Marketing Science</em></td>
<td>Furthering the integration of Marketing and Logistics through Customer Service in the channel</td>
<td>Article</td>
<td>Core</td>
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<td>7</td>
<td>Zeithaml, V.A. et al. (1990)</td>
<td>USA</td>
<td><em>The Free Press</em></td>
<td>Delivering quality service: balancing customer perception and expectations</td>
<td>Book</td>
<td>Absent</td>
<td>Core</td>
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<tr>
<td>No.</td>
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<td>E. Powell Robinson et al. (1990)</td>
<td>USA</td>
<td><em>Int. J. of Physical Distribution &amp; Logistics Management</em></td>
<td>Customer Service: implications for distribution system design</td>
<td>Research paper</td>
<td>Core</td>
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<td>10</td>
<td>Byrne, P.M. et al. (1991)</td>
<td>USA</td>
<td><em>Council of Logistics Management</em></td>
<td>Improving quality and productivity in the Logistics process: achieving customer satisfaction breakthroughs.</td>
<td>Book</td>
<td>Ancillary</td>
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<td>M. Johnston (1991)</td>
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<td>Customer Service in physical distribution: the dimensions and some strategies for achieving them</td>
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<td>Ancillary</td>
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<td>Cavinato J.L. (1992)</td>
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<td><em>J. of Business Logistics</em></td>
<td>A total cost/value model for supply chain competitiveness</td>
<td>Article</td>
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<td>13</td>
<td>Paul R. Murphy et al. (1994)</td>
<td>USA</td>
<td><em>Int. J. of Physical Distribution &amp; Logistics Management</em></td>
<td>A framework for applying logistical segmentation</td>
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<td>USA</td>
<td>West publishing company</td>
<td>The management of business Logistics</td>
<td>Book</td>
<td>Absent</td>
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<td>Timo Pirttilg et al. (1996)</td>
<td>Finland</td>
<td>Int. J. of Production Economics</td>
<td>A framework for cost-service analysis in differentiation of Logistics services</td>
<td>Research paper</td>
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<td>Neth.</td>
<td>European J. of Marketing</td>
<td>The power of perceived service quality in international Marketing channels</td>
<td>Research paper</td>
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<td>22</td>
<td>Blair Freeman et al. (2000)</td>
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<td><em>Supply Chain Forum</em></td>
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<td>Logistics Service Quality as a segment-customized process</td>
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<td>Erik M. van Raaij (2005)</td>
<td>Neth.</td>
<td><em>Marketing Intelligence &amp; Planning</em></td>
<td>The strategic value of Customer Profitability Analysis</td>
<td>Literature review</td>
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<td>33</td>
<td>Spiros Gounaris (2005)</td>
<td>Greece</td>
<td><em>J. of Services Marketing</em></td>
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<td>Absent</td>
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<td>Absent</td>
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<td>36</td>
<td>Hsiao Ching Chen et al. (2007)</td>
<td>Taiwan</td>
<td><em>Int. Conference on Industrial Engineering</em></td>
<td>Analyzing customer satisfaction and service level using AI technique</td>
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<td>Absent</td>
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<td>Yuexue Hu et al. (2008)</td>
<td>China</td>
<td><em>Int. Conference on Service Operations</em></td>
<td>Analyzing Logistics service performance Level based on customer perception</td>
<td>Research paper</td>
<td>Absent</td>
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<td>39</td>
<td>Mariah M. et al. (2008)</td>
<td>USA</td>
<td><em>Supply Chain Management: An Int. J.</em></td>
<td>Determining a cost-effective Customer Service level</td>
<td>Research paper</td>
<td>Absent</td>
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<td>40</td>
<td>Reinaldo Guerreiro et al. (2008)</td>
<td>Brazil</td>
<td><em>The Int. J. of Logistics Management</em></td>
<td>Cost-to-Serve measurement and Customer Profitability Analysis</td>
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<td>Absent</td>
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<td>42</td>
<td>Estelle R.S. et al. (2011)</td>
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<td>Article</td>
<td>Absent</td>
<td>Absent</td>
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<td>43</td>
<td>Nai Hua Chen et al. (2011)</td>
<td>Taiwan</td>
<td><em>Springer Science Business Media</em></td>
<td>Market segmentation, service quality, and overall satisfaction: self-organizing map and structural equation modeling methods</td>
<td>Research paper</td>
<td>Ancillary</td>
<td>Ancillary</td>
<td>Absent</td>
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<td>No.</td>
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<td>Title</td>
<td>Research method</td>
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<td>45</td>
<td>Varanya Tilokavichai et al.</td>
<td>India</td>
<td>World Review of Business Research</td>
<td>Establishing Customer Service and Logistics management relationship under uncertainty</td>
<td>Research paper</td>
<td>Core</td>
<td>Ancillary</td>
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<tr>
<td>46</td>
<td>Ryszard Barcik et al.</td>
<td>Poland</td>
<td>University of Bielsko-Biała press</td>
<td>Marketing and Logistics</td>
<td>Research papers</td>
<td>Core</td>
<td>Absent</td>
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<td>47</td>
<td>Maria G. Piscopo (2013)</td>
<td>USA</td>
<td>Georgia State University Scholar Works</td>
<td>Effect of relationship quality and Cost to Serve on customer value in business market</td>
<td>Research paper</td>
<td>Absent</td>
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<td>48</td>
<td>Yannis Politis et al.</td>
<td>Greece</td>
<td>J. of Modelling in Management</td>
<td>Logistics Service Quality and its effects on customer satisfaction in the manufacturing companies’ supply chains</td>
<td>Case study</td>
<td>Absent</td>
<td>Core</td>
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<td>49</td>
<td>Lei Sun et al.</td>
<td>USA</td>
<td>Computers &amp; Industrial Engineering</td>
<td>Estimating the long-term Cost to Serve new customers in joint distribution</td>
<td>Research paper</td>
<td>Absent</td>
<td>Absent</td>
<td>Core</td>
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<tr>
<td>50</td>
<td>Paul Hong et al.</td>
<td>USA</td>
<td>J. of Service Management</td>
<td>Strategic Customer Service orientation: an empirical study</td>
<td>Case study</td>
<td>Ancillary</td>
<td>Ancillary</td>
<td>Absent</td>
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<tr>
<td>51</td>
<td>Weihua Liu et al.</td>
<td>China</td>
<td>Hindawi Publishing Corporation Discrete Dynamics in Nature and Society</td>
<td>A determination method of optimal customization degree of Logistics service supply chain with mass customization service</td>
<td>Research paper</td>
<td>Absent</td>
<td>Ancillary</td>
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<tr>
<td>No.</td>
<td>Author (year)</td>
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<td>52</td>
<td>Gajewska Teresa et al.</td>
<td>Greece &amp; Poland</td>
<td><em>Int. Conference on Advanced logistics and Transport</em></td>
<td>Importance of Logistics services attributes influencing customer satisfaction</td>
<td>Research paper</td>
<td>Absent</td>
<td>Ancillary</td>
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</tbody>
</table>

**Table 1 – Classification of the reviewed papers**

*Notes:* Generally only the first author’s country is reported; as for the addressed themes, please note that: core, (one of the) central subject(s) of the paper; ancillary, partially tackled within the paper but not as the main focus; absent, not discussed.
4.3 GENERAL OVERVIEW ABOUT LOGISTICS CUSTOMER SERVICE

The central issue for any business is how to meet or to exceed customers’ expectations, at an affordable cost in respect to prices customer are willing to pay. This means overcoming the tendency, within marketing, of taking decisions aimed entirely at the search for customer satisfaction, without taking into account the effect on the profit. It also means overcoming the tendency, within management control, of focusing on cost orientation without understanding the effects on customer satisfaction. From a business point of view it means understanding the relationships between services received and customers’ willingness to pay a specific price, identifying the methodology of value creation for the customer and finding the costs of the activities creating value for the customer in order to prove profit sustainability. In other words it means creating a methodical approach which integrates the instruments employed in marketing and logistics. Even though these disciplines have been studied separately, in recent years many logistics texts and journal offer a large number of examples of how marketing and logistics interact in terms of the marketing mix components. In fact, numerous marketing theories, concepts, and ideas are applicable to the logistics field: the concept of market segmentation, for instance, is a strategic marketing management tool that involves the clustering of customers who have similar responses to a product offering in order to be able to maximize the value extraction. The conceptual foundations of market segmentation can be easily conveyed to logistics: segmentation falls between customization at one end of the spectrum and mass marketing at the other. Actually logistics services have become a substantial source of competitive advantages between firms and major challenges exist relative to their customization and, nowadays, irrespectively of produce markets or service markets, customer demands present different levels and different characteristics. It means that a type of product or service could possibly have the extremely high effectiveness to a certain kind of customers in a market, but could actually be good for nothing to another kind of consumer. Facing various customer’s demands, companies and industries as a whole can not meet the needs of their entire customer base by providing standard logistics services. However, with respect to logistics, it would generally be excessively expensive and highly unrealistic for companies to design a separate logistics network for each and every customer except if there were a limited number of customers. Otherwise, companies may waste resources and alienate customers by applying one logistics scheme to all customers. Just as most businesses can recognize separate market segments, Fuller et al. (1993) argue that most companies compete in logistically distinct businesses. While Fuller et al. (1993) and Daley (1981) have espoused the value of logistical segmentation, such segmentation has seldom been applied to transport and logistics decisions, and it is proved by the
lack of researches and case studies concerned with this theme. On the other hand, most companies have taken a “generic” approach (Fuller, 1993) to the provision of logistics services supplying, for instance, one single level of service to all customers. This frequently results in some customer groups being overserved, while other customer clusters are underserved. The challenge thus is to mature practical tools for logistical segmentation and in this vein, Fuller et al. (1993) provide a number of different variables (e.g. unit value, sales volume) which might be used to segment customers logistically. If customer segmentation can benefit companies in providing different services to their customer it is also true that this subject stands at the base of the customer-service costs measurement, and, more in general, at the base of the customer profitability analysis. For instance Niraj et al. (2001) have noted that, in recent years, marketing professionals and academicians have established a series of new marketing concepts with emphasis over the importance of building relationships with customers. The straightforward principle behind these concepts is that a customer-driven tactic enables a firm to focus on individual, or on homogeneous groups, of customers and consequently enhance its profitability by serving these customers in a differentiated way. An essential aspect of such a customer-driven marketing method is an assessment of profitability at the customer level with a view for formulating more effective marketing plans (Lloyd, 1982). Additionally, over the last 10 years, strategic cost management and activity-based costing (ABC) have shaped a framework for firms to examine further closely the drivers (or causes) of their costs in order to develop management choices and corporate profitability. Companies originally focused on product profitability are now using ABC and other models to examine deeply the profitability of distribution channels and customers. These analysis are part of the customer profitability analysis (CPA) which consists in the analysis of the revenue streams and service costs associated with specific customers or customer groups (Bottani, 2006). Good practice suggests that the customer profitability analysis should be undertaken over the lifetime of customers, so that a customer lifetime value (CLV) can be obtained. An accurate customer-profitability analysis is compulsory if firms are to formulate appropriate marketing and logistics strategies with the objective of maximizing their profits. Such an analysis involves first of all the clear understanding of what are the common fields between marketing and logistics, then an accurate assessment of customer service costs and profitability per customer.

In this context the three prominent themes further discussed in the following paragraphs are:

1. Marketing and logistics: diverse disciplines linked by the customer service rationale;
2. The evaluation of the logistics service quality;
3. The cost-to-serve (CTS) and the customer profitability analysis (CPA);

4.4 MAIN THEMES

The main themes emphasized in paragraph 4.3, given their input-output relationship, are discussed separately and consecutively. Indeed the main highlights resulting from the dissertation of synergies and commonalities between marketing and logistics might put the drive for a more detailed and well comprehensive analysis the main drivers for the evaluation of the logistics service quality. In turn the discussion about the Logistics Service Quality is supposed to support and strengthen the awareness about the quality of the service provision, while the cost-to-serve is intended to strengthen and support the awareness on the cost side of the service provision. In turn these two may reinforce the background and influence the knowledge about the factors at the base of the customer profitability analysis.

MARKETING AND LOGISTICS: DIVERSE DISCIPLINES LINKED BY THE CUSTOMER SERVICE RATIONALE

From a first insight one may believe that marketing and logistics are two totally separate and distinct disciplines, and worldwide it is acknowledged that they are generally very far from each others. This hypothesis is well supported in the practical and empirical world by the current set-up of companies: nowadays it is hardly conceivable to see and study companies treating logistics and marketing together and establishing among them close relationships. Indeed the real world evidence shows these two functions as two different drivers that rarely get in touch. However recent emphasis on physical distribution in both academic and trade literature discloses a growing body of knowledge around the commonalities between these disciplines, especially for what concerns the concept of customer service. In fact both marketing and logistics disciplines have offered over years various definitions of customer service, but they have failed to offer a comprehensive framework representing it together with related marketing and logistics issues concurrently (Ryszard, 2013). As a matter of fact customer service is in the process of a major evolution and the effort to more accurately define and understand the area, its scope, role, responsibilities and definition have to be discussed and questioned in details. The importance of customer service as a strategic issue has emerged in particular during the last decade, due to a twofold reason (Bottani, 2006). First, brand power has progressively decreased, making products almost undifferentiated in terms of trademarks. Customers do not rely on brands except in a few market niches, such as fashion. Second, due to technology diffusion, the functionalities and technological features of products tend
to be the same (Bottani, 2006). It means that today new customers cannot be acquired counting only on brands or on technical characteristics of products. On the contrary, the breath of logistics services related to products may play a noteworthy role in the competitive scenario (Vandermerwe and Rada, 1988; Bailey, 1996). As a consequence of this shift towards service, customers have become more and more exacting about logistics performances (Lee-Kelley, 2002). Many forces, including an emerging buyer/seller relationship which accentuates closeness and understanding, enlarged communication and information, organizational specialization, and substitutive production/distribution techniques have in part instigated this evolution (Ryszard, 2013). Continued efforts of marketing, which is concerned with the activities leading to the transaction, and logistics, which addresses the physical movement and storage of goods and services contribute to improved understanding of their roles and boundaries over customer service activities (Harris and Stock 1985). Consequently, this attention has led to some confusion over what customer service is, and how it fits with marketing and logistics. Such confusion origins from a diversity of questions, including: who should be responsible for customer service? is customer service conceptual, strategic or operational?; and is customer service cost controller or profit driven? (Ryszard, 2013). Some authors view customer service as a part of marketing or physical distribution (Kotler 1984; Bowersox, Closs and Helferich 1986; LaLonde and Zinszer 1976; LaLonde, Cooper and Noordewier 1988). Others, especially those within organizationally defined customer service groups do not see themselves as a subset but rather a separate function of the company. The International Customer Service Association (ICSA) defines customer service as “those functions within a business that have customer satisfaction as their responsibility and provide that satisfaction through the fulfilment of sales order demand and/or information needs” (ICSA Certification). Organizationally, customer service involves a variety of people at different levels within the organization and it is a pervasive, boundary-spanning activity that takes place from within and beyond the firm (Ryszard, 2013). The key to create a unified perspective is integration from within the firm and between the firm and the other channel members (Barton, 1995). Integration within the firm should focus on marketing and logistics activities: these are the primary functions which interface with the customer and the thrust of the firm (to obtain and service demand). As previously evidenced, traditionally marketing and logistics have evolved separately within many corporations, however, one key to resolve the role, responsibilities and scope of customer service begins with the integration of these major customer contacting functions (Harris and Stock 1985) through a deep dive about their activities over the market (Ryszard, 2013). Actually the market is a logical point of departure for analysis of organizational activities and it is useful to introduce the notion of
“channel”, that, according to Palmer (2012) consists in the set of practices or activities necessary to transfer the ownership of goods from the point of production to the point of consumption. Moreover the channel is not only the way of products’ physical delivering to stores, but also a choice of stores’ type, their location and forms of sales, which influences a way of products delivering to consumers. The consideration of channel integration on the firm’s marketing and logistics activities substantiates the need for coordinated marketing and logistics interface activities between channel members as well as between the functional areas within each firm (Ryszard, 2013). As an example, the salesperson’s ability to complete the transaction with the customer may be dependent on logistics’ ability to deliver the product within the allowable delivery window determined by the customer’s warehouse operating constraints. In this case the purchasing agent and salesperson interact as marketing channel representatives, while the managers of the supplier and customer warehouses and the transportation carriers participate in the logistics activities which contribute to the transaction. Without coordination of the marketing and logistics functions within both firms, channel effectiveness can not be maximized. The notion that the channel system is an appropriate vehicle for integrating marketing and logistics activities is not new in literature, however what has been lacking is a better understanding of how the coordinated efforts of marketers and logisticians is required and impacts the ability of the channel system to deliver the appropriate service output levels. As a consequence a deep dive about the main interfaces between marketing and logistics is pointed out in agreement with what deeply evidenced by Lloyd M. Rinehart, M. Bixby Cooper and George D. Wagenheim from the Michigan State University in 1987 with an article published on the Journal of the Academy of Marketing Science.

Marketing activities have traditionally been classified into the general areas of product, price, promotion, and place: the interaction of these four areas enables the possibility to carry out transactions between the firm and its customers lead to customer satisfaction or dissatisfaction:

- **Product**: marketing decisions with respect to the product have a direct impact on logistics. The interface between these product decisions and logistical performance determines if channel member expectations of service will be satisfied. For instance product line breadth and width determines the number of stock keeping units (SKUs): as the number of SKUs increases, customer expectations regarding product practical performance can be more closely matched. Nevertheless, this increase in SKUs totally affects the ability of the logistics system to maintain adequate inventory levels and fill rates. The likely result is that the stock-out rate will increase, fill rates will decrease, and customer expectations regarding
product obtainability will not be met. Failure to provide availability of the product worsens customer service levels and increases customer dissatisfaction. On top of that it is also proven that packaging decisions are directly linked to logistics activities: package design, size, and shape influence materials handling characteristics, transportation mode selection, and space utilization issues in bit logistics facilities and transportation matters. Indeed changes in package design can have a dramatic impact on all three of these areas (Razzano 1986). In addition, improved package design and reduced damage rates in shipment are directly related, with concomitant results on customer satisfaction based on their perception of the service provided by sellers.

- **Price**: pricing decisions can have a similar effect on logistics activities with a severe impact on customer service performance. The quantity discount structure serves to influence customer order size, and order size, in turn, may be a determinant of the transportation mode selected. A not well-designed discount structure may lead to numerous small orders or even to less-than-truckload shipments. Alongside, traditional industry practices of periodic price allowances and trade incentives might create a “bumpy” demand pattern (Powers 1985). This pattern in demand can increase the difficulty in managing inventory levels, facility utilization and transportation operations. The impact of a bouncy demand pattern is an increase in stock-outs, decreased fill rates, and longer orders cycle times. Additionally promotional decisions statements and promises made by the firm’s sales force during negotiation with customers influence the customer’s expectations of customer service: such declarations concern logistics activities which include delivery times and inventory availability. In circumstances where the customer is told by the sales representative that the product can be delivered on a certain day, the delivery on that day becomes a customer expectation. When the delivery cannot be made on time, the discrepancy between the actual performance and the expectation created during negotiation likely creates customer dissatisfaction.

- **Place and promotion**: behavioural and channel structure strategies influence the customer service provided by the firm. A classic example of this is when the producer wants to achieve additional control over the product display, promotion and pricing to consumers: in one hand this strategy enables the producer to see what is going on in the market making empowering it in collecting feedbacks and improving market awareness, on the other hand this creates a reduced retailer control of product management and other marketing responsibilities creating dissatisfaction when retailers want to implement promotional or
pricing strategies of their own, which were not part of the accepted policy of the produces. Beside that the postponement strategy is an often ignored channel alternative which is also directly related to logistical activity (Alderson 1950): implementation of the principle results in shifting activities through the channel in an effort to gain logistical efficiency and/or higher service levels. In addition to channel structure and control, firms have found advantages by trading off the cost of carrying inventory in the channel, with the cost of locating production and assembly operations closer to customers: firms implementing a postponement strategy may locate final assembly and packaging operations at their distribution centres. This strategy provides higher levels of service by allowing customer specification of product characteristics while at the same time reducing transportation time for delivery.

In addition to the marketing mix leverages also some major logistics strategies and activities are intended to influence the customer service strategies, and they are:

- **Inventory decisions**: customers’ inventory requirements can influence the level of service expected. Actually customers who attempt to minimize inventory, often require that suppliers assume the cost of keeping inventory in the channel, or the cost of first-class transportation to meet the service standards required for a just-in-time inventory management strategy: these systems force more formal vertical marketing relationships between suppliers and customers. They also require different roles for sales representatives who must make service performance a priority: customers who use a just-in-time philosophy with their suppliers reduce their inventory carrying costs which allow greater flexibility in establishing prices, but given the need to replenish constantly the customer they increase transportation costs. Firms in free flow channel systems that do not capitalize on established relationships within the channel must be prepared to interface with independent distributors that draw from existing inventories. Delivery from these inventories can provide a high level of customer service without the need for an established ongoing relationship between the parties. However, in these systems each firm assumes greater costs in holding inventories, maintaining facilities, and staffing the sales force that pushes the product in the channel, which results in higher product prices.

- **Transportation decisions**: transportation decisions can provide divergent levels of customer service within the channel and influence the price offered to the customer. The modes and carriers used by suppliers influence arrival times and ultimately the customers perception of
the service level provided by the supplier. For-hire carriage may be used in free flow systems to maximize the level of customer service provided to one time customers or to customers that order infrequently. In other situations, the customer may demand the use of a specific carrier with the threat to take their business elsewhere if the carrier is not used. On the other hand, arrangements made between two members of an administered vertical marketing system may justify the use of contract carriage to provide service when the contractual agreement between the supplier and the carrier may have a stronger legal base than the agreement between the supplier and the customer for the goods being moved. Finally, private fleets give participants at all levels of the channel the opportunity to directly control the movement of products to and from their locations. This can maximize the benefit from the cost/service trade-offs which influence the transaction and customer service environments.

As widely showed, in addition to the marketing mix leverages, both inventory and transportation decisions represents a sort of link between marketing and logistics: actually literature well explains how logistics and marketing are strictly wired and what is the importance of the roles they mutually perform, with special regards to the process of delivering a consistent and effective customer service. The tangible aspects of this linkages have been someway evaluated through the logistics service quality function that is going to be assessed in the following paragraph.

**LOGISTICS SERVICE QUALITY**

As highlighted through the dissertation about the customer service, many businesses have moved beyond viewing Logistics as merely an area for cost improvements to viewing logistics as a key source of competitive advantage (Novack, Rinehart, and Langley 1994) and as a significant driver for the provision of an optimal customer service. Stemming from this stream of research, logistics service capabilities can be leveraged to create customer and supplier value through service performance (Novack, Rinehart, and Langley 1994); increase market share (Daugherty, Stank, and Ellinger 1998); enable mass customization (Gooley 1998); positively affect customer satisfaction and, in turn, corporate performance (Dresner and Xu 1995). However to successfully leverage on Logistics excellence as a competitive advantage to customers, logisticians must coordinate with marketing departments (Kahn 1996; Kahn and Mentzer 1996; Mentzer and Williams 2001; Murphy and Poist 1996; Williams et al. 1997). Actually the quality of logistics service performance is a key marketing component that helps create customer satisfaction (Bienstock, Mentzer, and Bird 1997; Mentzer, Gomes, and Krapfel 1989). There are many definitions and descriptions of how logistics
creates customer satisfaction. The most traditional are based on the creation of time and place utility (Perreault and Russ 1974). The so-called “Seven Rs” describe the attributes of the company's product/service offering that lead to utility creation through logistics service; that is, part of a product's marketing offering is the company's ability to deliver the right amount of the right product at the right place at the right time in the right condition at the right price with the right information (Coyle, Bardi, and Langley 1992; Shapiro and Heskett 1985; Stock and Lambert 1987). On the other hand Parasuraman, Zeithaml and Berry (1985), on the basis of focus group interviews with customers and in-depth interviews with executives in consumer sectors, defined ten dimensions of service quality: tangibles, reliability, responsiveness, competence, access, courtesy, communication, credibility, security and understanding the customer. Subsequent research (Parasuraman, Zeithaml and Berry, 1988) exposed only five dimensions. Tangibles, reliability and responsiveness remain the same, while assurance and empathy incorporate the other seven dimensions. Moreover in the past, it has been assumed that the service quality dimensions found in consumer settings could be applied to business markets as well (Holmlund and Kock, 1995). However, in a B2B environment other factors may play a role in perceived service quality than the ones found in a B2C context. Kong and Mayo (1993) stated that reliability and responsiveness may also be important in a business setting, but a dimension dealing with innovativeness can be important as well. In their study, Babakus, Pedrick and Richardson (1995) observed that price could be another indicator of a dimensional conceptualization of perceived service quality. The most elaborate research for the determinants of perceived service quality in a business setting was published by Westbrook and Peterson (1998). The academics discovered twelve dimensions or determinants for perceived service quality in a B2B environment: responsiveness, competence, consultative selling, reliability, price, interpersonal skills, accessibility, credibility, product offering, market clout, geographical presence and tangibles. The comparison of the ten dimensions of perceived service quality initially defined by Parasuraman, Zeithaml and Berry (1985) (B2C dimensions) and the twelve dimensions for perceived service quality in a business scenery defined by Westbrook and Peterson (1998) (B2B dimensions) reveals that some of the scopes defined in a consumer context also appear in a business context, like reliability, responsiveness, competence, accessibility, and credibility. However, not all the dimensions are similar across the two different settings. The B2C tangibles dimension encompasses the physical evidence of the service, while the B2B tangibles dimension stresses the tangible support for service delivery. The research of Westbrook and Peterson (1998) also revealed four dimensions which were not indicated by Parasuraman, Zeithaml and Berry (1985): price, product offering, market clout and geographical presence. This comparison between the
determinants of perceived service quality in a consumer (Parasuraman, Zeithaml and Berry, 1985) versus a business (Westbrook and Peterson, 1998) setting confirms the previous research of Kong and Mayo (1993) and Babakus, Pedrick and Richardson (1995): in a B2B environment other determinants may play a role in perceived service quality. Until now, the instrument to measure perceived service quality that is most widely spread, in academic research but also in practice (Lam and Woo, 1997), is the SERVQUAL scale developed by Parasuraman, Zeithaml and Berry in 1988 (Parasuraman, Zeithaml and Berry, 1988). This assessment of perceived service quality by means of SERVQUAL is based on the service quality dimensions (Parasuraman, Zeithaml and Berry, 1988). As those dimensions are not identical in a consumer versus a business framework, the measurement of perceived service quality in a B2B context needs to comprise other determinants than those used in a B2C context. As a consequence over years a new scale, called the B2B SERVQUAL scale, intended to measure the perceived service quality in a B2B environment and based on the business scopes as defined by Westbrook and Peterson (1998), has been developed. In order to do so the items defined by Parasuraman, Zeithaml and Berry (1988) to outline the SERVQUAL are replaced by items that refer more to a business environment. Moreover, the five dimensions defined by Parasuraman, Zeithaml and Berry (1988) are converted and extended with other dimensions that seem to play a role in the perceived service quality of a B2B setting, based on the research of Westbrook and Peterson (1998). These aspects have been widely studied in a research by Gajewska (2015), in which the author assessed the importance of the logistics services attributes influencing business customer satisfaction with the quality of logistics services. It was concluded that according to customers’ expectations, the most important attributes were the promptness and the timeliness of deliveries, followed by completeness of deliveries, whilst the least important was the transportation conditions (Gajewska, 2003). On top of this research the promptness and the timeliness as well as the quality of the physical distribution service industrial purchasers received from suppliers has been shown to be an important consideration in industrial purchasing decisions, and both corporations and researchers are becoming increasingly aware of the strategic role of logistics services in a firm's overall success (Bienstock, Mentzer, and Bird 1997; Bowersox, Mentzer, and Speh 1995; Brensinger and Lambert 1990; Mentzer, Gomes, and Krapfel 1989). In particular Bienstock, Mentzer, and Bird developed a multi stage model to evaluate the satisfaction level of the customer. Among the other findings they pointed out that order release quantities positively affects order accuracy and timeliness, and in turn that timeliness positively affects satisfaction. Actually timeliness has long been discussed as an important component of logistics services: these scholars theorized that an order would be considered on time when it was considered accurate, in good
condition, and of acceptable quality. If these three criteria are not met, timeliness is also affected by when the discrepancies are handled adequately. Then, additionally, they hypothesized that perceptions of order accuracy, order condition, order quality, and order discrepancy handling affect perceptions of timeliness (Bienstock, Mentzer, and Bird, 1997).

It is pretty evident that the SERQUAL has been widely used among logisticians and marketers; however in recent years a SERVQUAL dedicated to the business-to-business market has been developed. In this particular kind of scale particular attention has been put over the timeliness perspective of logistics that has been widely discussed mainly by academicians. However logistics service quality does not consist in the only one parameter used to assess capabilities in service provision. Actually in literature another approach to service orientation is diffused, the cost to serve. This particular methodology is generally intended to assess the service delivery under an economical point of view, and according to many academicians it should be studied concurrently with the logistics service quality.

COST TO SERVE AND CUSTOMER PROFITABILITY ANALYSIS

Customer service is an extremely important aspect of the corporate physical distribution operation, and the physical distribution management must operate with a continual inter relationship with customer service. Indeed it makes no sense to minimise total distribution costs if at the same time customer relations are being eroded. On the other hand customer service levels can be excessive and wasteful of resources (Gilmour, 1976). The difficult task is to find the balance between these extremes. “The problem at the management interface between marketing and distribution is to decide where on the trade-off continuum between distribution cost and customer service the company should operate.” (Yannis, 2014) Related to this task, logistics literature offers generally two divergent main approaches: the total cost concept and the customer service concept. The total cost concept considers logistics as a cost incurring function, which has to be managed by minimizing total logistics costs. According to the total cost concept, the costs of individual functions need not be at their optimum, but attention must be paid to minimizing the delivery costs of the entire firm (Pirttila, 1996). To avoid excessive attention to cost control, and to focus more on the needs of customers, the customer service concept could be applied. In the customer service approach, logistics customer service is split into components or service elements making it possible for a company to differentiate itself from the competitors by offering better logistics services appreciated by the customers. With regards to the total cost concept firms incur a series of cost and expenses to develop and maintain relationship with customers (Piscopio, 2013). Such costs may
include communication, support service, loyalty programs and order management among others (Kumar and Rajan, 2009; Niraj, Foster, Gupta, and Narasimhan, 2008). However, customers are not equal in the amount of services and activities they demand from suppliers, consuming unequal amount of resources: actually activities such as order management, logistics, sales and marketing support are performed at different levels for different customers (Piscopio, 2013). The cost of maintaining relationships can vary greatly across customers, impacting the profit generated from relationships (Van Triest, 2009). An assessment of the value generated by a customer relationship is not complete without including all costs and expenses dedicated to serve such relationship (Guerreiro et al., 2008; Niraj, 2001). Different terms are found in the literature to refer to the cost of serving and maintaining customer relationships, being some: customer-specific cost (Niraj, 2001), customer relationship costs (Van Raaij, 2005), customer-specific marketing expenses (Van Triest, 2009), marketing cost (Kumar, 2008), relationship cost (Stahl, Matzler, & Hinterhuber, 2003), cost of sales (Berger, 1998), customer service cost (Niraj, 2008) and, finally, cost-to-serve (Braithwaite, 1998; Guerreiro, 2008; Kaplan, 2001; Ryals, 2006). Cost-to-serve (CtS) has been demarcated as the total pre-sale, order related, distribution, and post-sale service cost required to preserve an ongoing exchange relationship with a customer firm (Guerreiro, 2008). Cost-to-Serve® also refers to a quantitative, financial-driven practice developed and registered by Braithwaite and Samakh (Braithwaite, 1998). Their method analyses how costs are spent throughout the supply chain and estimates the profitability of products, customers and marketing channels. The evidence is then used in decision making to optimize firm’s profitability. Cost-to-Serve is a more comprehensive concept than customer-specific marketing cost, including relevant logistic and financial costs related to servicing individual customers. Kaplan and Cooper (1999) explained their cost-to-serve analysis and matured a model to classify customers based on how costly they are to serve (dividing customers into high and low cost-to-serve). In their conceptualization, drivers of high cost-to-serve customers comprise demand for customized products, customization and changes in delivery requirements, small and random orders, large amount of presales support (marketing, technical and sales resources), large amount of post-sales support (installation, training, warranties, etc.), inventory requirements. The authors stated that low cost-to-serve customers are not automatically profitable: profitability depends on the gross margin the customer generates, which finally depends on relationship specific policies. Their model proposes a two by two matrix in which the horizontal axis represents the cost-to-serve and the vertical axis reproduces net margin (revenue minus cost of goods sold). Customers above the diagonal line are profitable while the ones below engender losses. There is no problem with customers demanding high service level as long as they are willing to pay
for them. Selling firms’ strategy should attempt to move all customers to the profit area, by either reducing cost-to-serve or improving the margin of customers. Customers in the bottom right quadrant (low-margin, high CtS) represent a major challenge. Later on Niraj, Gupta and Narasimhan (2001) developed a model to estimate customer profitability from a supply chain perspective. The authors calculated customer-specific costs by determining the share of supply chain activities that are attributable to individual customers. Their model includes both complexity and efficiency factors that can either increase or decrease customer-specific costs. They found empirical evidence that even though sales volume remains an important meter of customer profitability, differences in the cost of serving the customer play an equally important role. In a later study Niraj and colleagues (2008) estimated the cost of servicing customers by using an activity-based costing approach and including seven major activities areas: order processing, sales, delivery, expedited delivery, quality management, purchasing and warehousing. Costs of these events are allocated to customers using three categories of cost drivers: volume related drivers, complexity related drivers and efficiency related drivers. Customer-specific marketing expenses have also been used to estimate the profitability of individual customers. A 2009 study classifies marketing expenses in two categories: general and customer-specific, which they define as those “made to increase profitability in specifically target customers” (Van Triest, 2009). The authors found evidence that customers receiving higher customer-specific expenses show higher retention rate, sales and profits. However, their study also shows that volume is the main driver of both retention and customer profitability. Since cost-to-serve includes all sales, marketing, administrative and logistic costs incurred while serving a customer, customer-specific marketing investment can be considered a sub-set of cost-to-serve. Cost-to-serve is a decision variable controlled by the selling firm (Venkatesan, 2007) but also depends on customer behaviour (Guerreiro, 2008): customers vary in their demands for service, their customization requests, their ordering patterns, and their propensity to return sales to name a few behaviours (Piscopio, 2013). The more bargaining power customers have over suppliers, the more demanding they would be and the more costly to serve. Customers bargaining power is strong when customers are large, concentrated and educated about the product they are buying (Porter, 2008). Cost-to-serve is of particular relevance in business-to-business marketing, where customers tend to have more bargaining power over suppliers due to their size and concentration. Organizational customers tend to be more demanding and expect a higher level of customized service. Organizations usually need higher level of technical support than consumers do, especially when the firm’s offering impacts the customer’s production process.
In general, the cost of maintaining relationships in business-to-business markets is more significant than in consumer markets.

Even though several models have been discussed there is a certain degree of uncertainty when the cost-to-serve has to be measured. For instance most academics, with the notable exception of Johnson (1992), have advocated the ABC system as the most appropriate costing method for measuring customer-service costs. Kaplan and Cooper (1998) stated that the ABC system is, in theory, the most appropriate method for determining customer-service costs in companies with complex product, customer, and service requirements. However, despite this endorsement, ABC accounting has traditionally been applied to the measurement of costs in manufacturing activities, and only a limited number of empirical studies have applied this system to customer-service activities (Guerreiro, 2008). Other authors who have addressed this subject include Lewis (1991), who described a relatively simple ABC system for assessing marketing costs per product line and specified how this might be used to structure a profitability statement. Turney and Stratton (1992) presented a more organized activity-based model that included two activity levels – micro-activities and macro-activities – in allocating costs to products and customers. Foster and Gupta (1994) emphasized that marketing costs represent a significant part of the cost structure of many companies; however, in comparison with industrial cost studies, they noted that marketing costs have received very little consideration in the accounting literature. Stapleton et al. (2004) noted that the ABC system, after more than a decade of slow growth, had been achieving greater acceptance as a marketing and logistics cost-determination tool. In addition to these contributions, various conceptual studies have associated logistics activities and customer-service costs (Lambert and Lewis, 1983; Pohlen and LaLonde, 1994; Lambert and Burdugol, 2000; Cokins, 2003). In the costing process of different objects, such as customers and marketing channels, Kaplan and Cooper (1998) recommended the allocation of sales, marketing, distribution and administrative (SMDA) expenses to the costing objects, in accordance with the proposal of Christopher (1997). Kaplan and Cooper (1998) noted that such an allocation of expenses is not usually applied to customers because it is generally considered that these expenses are fixed and that any allocation would be random and confusing. However, in view of the growth of these expenses in all companies, Kaplan and Cooper (1998) argued that they are not actually fixed costs but they could not be considered variable costs because they are not directly influenced by sales volumes. Therefore, Kaplan and Cooper (1998) created a distinctive categorization to be applied to SMDA expenses – super-variable expenses. In an effort to identify the ABC method, Anderson and Kaplan (2004) proposed a so-called time-
driven ABC. The novelty of this approach is its emphasis on time as an activity-time driver and its determination of the unit times of services and non-used capacity time.

At the end over years hundreds ways on how to assess the cost-to-serve and the customer profitability analysis have been pointed out, and nowadays little evidence exists on what is considered as the best way. Actually almost all the approaches highlighted and discussed by scholars have found time by time practical implication in the real world and, at the moment, the assessment of the performance of these costing methods has not been fully appraised. As a consequence it is practically impossible to determine, with the instruments academicians have on hands, what is the best performing costing technique. Many scholars believe that there are different effective approaches and that their validity depends on the actual case in which they are applied. Actually, according to Cooper (1998) each case has to be clearly and fully studied in order to determine, on a case-by-case perspective, the most appropriate technique to assess the cost-to-serve and to perform a meaningful customer profitability analysis.

4.5 GAP ANALYSIS AND CONCLUSIONS

In this literature review section 52 contributions published between 1948 and 2015 on the mutual linkages between marketing and logistics and on descendent themes have been analysed. The papers have been revised with a two-pronged approach: research method(s) adopted and paper contents. The contribution is twofold: first, the development of a structured review that provides a guide to understand how the field of research had assessed the above mentioned themes, and second, and the identification of research issues for practical implementation. In general, a number of interesting themes in literature has been found: an in-depth analysis on the specific theme of past and present integration between marketing and logistics, their commonalities and their linkages has been performed. It has been observed that the topic has been tackled so far by several authors, thus highlighting the rising interest that researchers have in this theme. While contributions from the “public” (i.e. institutional) perspective are generally missing and papers focusing on practical implementation cases are totally absent. An absence of real world cases has been encountered also for the other two themes of this literature review: in fact, apart the outstanding work of Gajewska (2003) there is no evidence of practical application on how to practically measure the service quality of logistics and its cost-to-serve in real world companies. As far as the methodology is concerned, the review revealed that, alongside what expressed above, most of the examined articles
are research papers and also a number of conceptual papers have been analysed. At the opposite very few contributions based empirical studies have been encountered.

This review has thus revealed that the most important area, the practical submission of theoretical concepts (whatever the topic under analysis among the three evidenced) is under-represented. In general, what has emerged is the substantial lack of an up-to-date application in industrial as well as service on one hand and in business-to-business and business-to-consumers environments as well of the theoretical aspects that have been widely discussed among academicians. Moreover, the two subjects that could have been most likely studied under a practical point of view are not fine defined in theory as well: it seems that, even if the topics have been over years extensively assessed, a coherent model and a well-articulated execution strategy have not been designed yet. This results in the impossibility for practitioners willing to translate theory into practice to find a valid prototype as well as findings on which to base their implementation studies. Furthermore, from the point of view of the research methods, the under-representation of certain research methodologies, i.e. empirical studies and simulations, suggests opportunities in future research. This study has one major limitation which has to be considered. Indeed, while efforts were made to be all-inclusive, as Boone et al. (2007) recognised in their review of postponement, relevant research efforts may have been inadvertently omitted.
5. THE PROJECT IN LUXOTTICA

The present dissertation is integrated in a project carried out within Luxottica operations and focused in improving the logistics customer service and its related processes in order to somehow have an impact on both effectiveness and efficiency. This section of the dissertation is thus aimed at describing the perimeter of the project and the KPIs utilized in order to provide an overview of the instruments exploited to depict the AS IS processes and the possible insights for improvement. More in particular, in the first paragraph, a general overview about the on-field experience is provided, and then the second paragraph presents a deep-dive on the part of the business under analysis. Subsequently, in the third paragraph, the perimeter is further refined and the main KPIs are disclosed.

5.1 GENERAL OVERVIEW

The experience in Luxottica took place from 2015, September the 7th, within the EMEA Transportation Team in Sedico Distribution Centre. The main tasks concerned with that experience deal with the management of transport related KPIs aimed at measuring the overall speed of Luxottica logistics network and on their improvement as well. Additionally there has been the opportunity to deal with some projects among which the one further examined in the present study. This pilot project, managed for the first time in Luxottica, is aimed at revising, and consequently reorganizing, the logistics services delivered to a special category of Luxottica’s customers, STARS ones. Further information about this particular kind of business are evidenced in the following sections, however, before moving ahead it crucial to understand that in drawing and finalizing the current dissertation two major constraints have arisen: the on-field level of complexity and the need to preserve sensitive data. Indeed, on one hand, Luxottica’s multidimensional structure and huge size result in an extremely heterogeneous domain that can not always be simplified into few and easy describable as well as understandable variables: each business decision is influenced by thousands of aspects and thus the activity to reduce complexity might sometimes result too simplistic, even though necessary in order to move further along with the project objectives. On the other hand, the order of magnitude of the Company and its world-class leader role in the market has forced not to publish all the relevant information and data utilized for the purpose of this research. Additionally, some delicate phases of calculus as well as explanations of process and output figures have been concealed on purpose in order not to lose the opportunity to publish the present dissertation.
5.2 THE FOCUS OF THE STUDY

The present research is focused on a particular trade channel, the so-called STARS. STARS is the acronym of Superior Turn Automatic Replenishment System, and this particular way of doing business is devoted to opticians with whom Luxottica has established a partnership program that allows the Company to manage an independent store as a proprietary one. STARS business model has been introduced in 2002 by Luxottica within its Wholesale division with the aim to provide customers with an enhanced service that leverages Company’s knowledge of local markets and brands to deliver new, high-turnover products and maintain optimal inventory levels at each point of sale. By strengthening the partnership between Luxottica and its customers, this program directly manages product selection activities, assortment planning and automatic replenishment of Luxottica’s products in the store on behalf of the third-party customer, utilizing ad hoc systems, tools and state-of-the-art planning techniques. At the end of 2015, STARS served a total of over 5,700 stores in the major European markets, United States, Middle East and emerging markets for a total of 55 countries offering to customers:

1. **Best product selection**, based on brand segmentation, store profiles and market best sellers;
2. **Continuous refresh** of products in line with new releases and market trends plus recalls of slow moving items;
3. **Automatic replenishment** system to timely replace sold items through exchange of sell-out data;
4. **Store consulting** activity and merchandising tools to optimize displays and store layouts;
5. **Optimized stock** levels based on sales trends, seasonality and store profiles;

These five key pillars engender likewise crucial benefits for customers:

1. **Guaranteed increase of sales**: steady sales increase through a faster turn of display. During the first year of partnership sales increase up to 25%, while in the years beyond they usually grow at 8-10% yearly;
2. **Optimized working capital**: lower inventory levels through lower back stock and fast replenishment. Being STARS customers’ stock directly managed by Luxottica they do not face any problem of back stock and their replenishment is automatically planned by the Company;
3. **Faster go to market**: priority on new releases through an advanced selection. STARS membership allows opticians to receive in advance in respect to standard customers new items and collections;

4. **Sharing of expertise**: a global benchmark available for stores. Luxottica shares its global expertise with opticians helping them to have always available the world’s top selling frames;

5. **Lower operating costs**: more efficiencies in stores’ supply chain activities. Luxottica plans in agreement with stores the dispatching frequency of orders and the delivery service, so that opticians know in advance when the replenishment is carried out;

The partnership is acknowledged to be a sort of win-win solution: in one hand opticians benefit from Luxottica’s endorsement and market awareness, on the other hand Luxottica benefits from the opportunity to enter in the retail market without owning the physical point of sale and thus without impacting, among the others, on fixed assets. Exactly for this reason this particular channel of trade is well developed in more than 55 countries globally, and its expansion trend is continuously rising.

### 5.2.1 BUSINESS DESIGN

STARS business is designed and organized into four main geographically areas: EMEA (Europe, Middle East and Africa), APAC (Asia Pacific), LATAM (Latin America) and US (United States and Canada). However, due to the vastness of the business in each macro region, the trade channel is managed with a country-by-country perspective. Furthermore, within the single countries, STARS customers are then segmented on the basis of both quantitative and qualitative variables. From a quantitative point of view the sell-out consists in the most important parameter, which basically is made up of in the number of frames sold by a STARS point of sale to end customers. In addition to the sell-out the surface of the store and of its own showcases are then considered. On the other hand, assuming a qualitative perspective, the location of the store and its relevance, qualitatively evaluated in terms of visibility opportunities it can create over customers, are taken into account as well. The combination of these variables engenders the establishment of four main classes: 0, 1, 2 and 3. In addition to these classes there are some other STARS customers that, given the particularity of the business they manage, are treated differently. These categories are Boutiques, Online stores, Outlets and DCs, and they are replenished with particular assortments and specific price policies.

On the basis of the above mentioned variables it is thus possible to distinguish between:
<table>
<thead>
<tr>
<th>Class</th>
<th>Definition and Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Class 0 is defined on the basis of the sell-out and it generally (each country is free to slightly adapt the boundary in accordance with the peculiarities of the market) includes only opticians that sell more than 3000 frames per year.</td>
</tr>
<tr>
<td>1</td>
<td>Class 1 is defined on the basis of the sell-out and it generally (each country is free to slightly adapt the boundaries in accordance with the peculiarities of the market) includes only opticians that sell no less than 800 frames per year, but no more than 3000. In combination to the sell-out class 1 is characterized by other variables, such as the assortment, which is mostly focused on high-end brands.</td>
</tr>
<tr>
<td>2</td>
<td>Class 2 is defined on the basis of the sell-out and it generally (each country is free to slightly adapt the boundaries in accordance with the peculiarities of the market) includes only opticians that sell no less than 800 frames per year, but no more than 3000. In combination to the sell-out class 2 is characterized by other variables, such as the assortment, which is mostly focused on medium-end brands.</td>
</tr>
<tr>
<td>3</td>
<td>Class 3 is defined on the basis of the sell-out and it generally (each country is free to slightly adapt the boundary in accordance with the peculiarities of the market) includes only opticians that sell no more than 800 frames per year.</td>
</tr>
</tbody>
</table>

Additionally the other classes can be described in the following way:

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boutique</td>
<td>Boutiques are mono-brand stores that are filled with special assortments and served with higher priority in respect to other STARS customers. Being focused on the luxury segment their sales volume is not considered as the primary objective and thus the sell-out is not taken into account for this kind of customers. On the other hand the position and visibility of stores is a crucial variable to determine their importance.</td>
</tr>
<tr>
<td>Online</td>
<td>Online are non-physical stores involved on the e-commerce business. These kinds of stores have a dedicated assortment which is more general and ample in respect to STARS physical stores and includes especially sunglasses rather than eyeglasses.</td>
</tr>
<tr>
<td>Outlet</td>
<td>Outlets are multi-brand stores that are filled with ad-hoc and exclusive assortments and apply special price practices.</td>
</tr>
<tr>
<td>DC</td>
<td>Distribution Centres warehouses of customers that manage several points of sale and that prefer to receive a consolidate shipping instead direct to store deliveries.</td>
</tr>
</tbody>
</table>

*Table 2 – STARS classes based on sell-out*

*Table 3 – STARS classes not based on sell-out*
5.2.2 LOGISTICS NETWORK SETUP

As reported above two pillars of the STARS business are the possibility for opticians to have a continuous refresh of product in line with new releases and market trends plus recalls of slow moving items and the opportunity to have an optimized stock levels based on sales trends, seasonality and store profiles. In order to effectively and consistently deliver these privileges to its customers Luxottica needs to optimize and continuously improve not only its internal processes, such as demand planning and after sales services, but it is also required to reliably manage what is beyond its boundaries, such as the transportation. Actually Luxottica works closely with a restricted number of logistics providers with whom it has developed long term partnerships as well as cooperation platforms. Generally STARS stores of each region are served by a representative distribution centre (Sedico, Italy, for EMEA, Dong Guan, China, for LATAM, Campinas, Brazil, for LATAM and Atlanta, Georgia, for US); however, if business requirements can not be directly and briefly satisfied by the representative DC, a back-up network of direct shipments from the other DCs exists. In order to assure state-of-the-art deliveries the Company works with three main kinds of logistics service providers:

- **Global forwarders**, which are mainly intended to move large portions of freight across the different DCs. Luxottica deals with few trusted partners for covering its worldwide STARS needs and thanks to a joint cooperation it has created over years a hub and spoke network;

- **Couriers and express couriers**, which are mainly intended to carry out either 24 hours or 48 hours national and international deliveries of medium-small shipments. Luxottica generally has a partner for each single country (or set of homogeneous countries, such as BENELUX) in order to exploit in full couriers’ awareness of the local market;

- **Groupage service providers**, which are mainly intended to carry out either 48 or 72 hours international deliveries of large consolidated shipments. Generally Luxottica make use of these providers to fulfil the needs of single STARS customers that given their huge sell-out volumes justify a dedicated delivery;

On top of these three main solutions the Company deals with other types of providers to reach either difficult countries (i.e. countries for which long lasting and time consuming customs operations are needed) or depressed zones. Additionally the above mentioned transportation solutions can be mixed together in order to reach relevant markets that are not geographically close to the main DCs. This is the case of Turkey, UAE or South Africa, which are generally served by a mixed model in which a global forwarder is appointed to move consolidated shipments from the
representative DC to the domestic courier’s hub, which in turn is employed in order to carry out the final delivery to the store.

5.3 THE VARIABLES OF THE STUDY

The present study goes through the assessment of STARS business according to by two main steps:

- First of all, in order to reduce the complexity of the business case and obtain an homogenous sample on which to build the analysis, the perimeter of the study is restricted to a sample of representative countries. Rules and final outcomes are discussed in paragraph 5.3.1;
- Secondly the parameters used to assess the performance of STARS markets included in the perimeter are discussed in details in paragraph 5.3.2. These KPIs are the Logistics Service Quality to STARS customers and the Cost-to-Serve;

5.3.1 THE PERIMETER

Given the global coverage of STARS business it is reasonable to expect a huge network complexity as well as the existence of several dissimilarities from country to country in terms of business management. As a matter of fact dealing with such complexity would be counterproductive: the great diversity that characterizes the business case would lead to a lack of focus and a waste of resources. In addition being the project aimed at creating an overall and cross-cutting model there are no reasons to deal with an extreme heterogeneous set of variables. Given these assumptions it is thus reasonable to define both a temporal and a physical perimeter through which complexity can be reduced. Additionally the perimeter has to be further refined through a deep dive about STARS classes.

TIME

In terms of time the perimeter is related to the year 2015 only: all STARS customers that have received at least one shipment between 2015, January the 1st and 2015, December the 31st are taken into account. These boundaries allow dealing with the most recent, but steadying, data so as to characterize the analysis by high accuracy, well representing the trends of the markets.

GEOGRAPHY

The definition of the physical perimeter, in terms of which countries to analyse, requires a more careful analysis rather than for the temporal perimeter. Actually to narrow the field and to reduce diversity it is possible to consider only the countries that are served by the same Distribution Centre. Being Sedico DC in charge of serving all the EMEA customers, the geographical
boundaries are restricted to the EMEA region only. However, this region consists of 41 countries, which, as a matter of fact, are still too uneven. As a consequence to refine the perimeter a weighted analysis through the score points technique is carried out: EMEA countries with more than 10 stores are thus compared on the basis of the following variables:

1. **Sell-in 2015**, which describes markets in terms of units shipped from Sedico DC to the customers of each single country all along the 2015. The sell-in is thus comparable to the sell-out (the number of units actually sold by stores to end customers must have the same order of magnitude of the number of units actually shipped to stores from the DC) and so it can be considered as the closest logistics variable to the turnover generated by the markets;

2. **Number of STARS customers**, which describes markets in terms of penetration of the STARS channel of trade and it is directly proportional to the complexity of the logistics network within a certain country;

<table>
<thead>
<tr>
<th>COUNTRY CODE</th>
<th>COUNTRY</th>
<th>SELL-IN 2015 [units]</th>
<th>CUSTOMERS [#]</th>
</tr>
</thead>
<tbody>
<tr>
<td>AE</td>
<td>United Arab Emirates</td>
<td>250.000</td>
<td>111</td>
</tr>
<tr>
<td>BH</td>
<td>Bahrain</td>
<td>17.000</td>
<td>14</td>
</tr>
<tr>
<td>CH</td>
<td>Switzerland</td>
<td>11.000</td>
<td>18</td>
</tr>
<tr>
<td>DE</td>
<td>Germany</td>
<td>200.000</td>
<td>252</td>
</tr>
<tr>
<td>DK</td>
<td>Denmark</td>
<td>43.000</td>
<td>115</td>
</tr>
<tr>
<td>EG</td>
<td>Egypt</td>
<td>58.000</td>
<td>51</td>
</tr>
<tr>
<td>ES</td>
<td>Spain</td>
<td>1.000.000</td>
<td>828</td>
</tr>
<tr>
<td>FR</td>
<td>France</td>
<td>500.000</td>
<td>572</td>
</tr>
<tr>
<td>GB</td>
<td>Great Britain</td>
<td>670.000</td>
<td>520</td>
</tr>
<tr>
<td>IN</td>
<td>India</td>
<td>28.000</td>
<td>63</td>
</tr>
<tr>
<td>IT</td>
<td>Italy</td>
<td>1.100.000</td>
<td>1075</td>
</tr>
<tr>
<td>KW</td>
<td>Kuwait</td>
<td>38.000</td>
<td>32</td>
</tr>
<tr>
<td>LB</td>
<td>Lebanon</td>
<td>38.000</td>
<td>18</td>
</tr>
<tr>
<td>NO</td>
<td>Norway</td>
<td>27.000</td>
<td>90</td>
</tr>
<tr>
<td>OM</td>
<td>Oman</td>
<td>16.000</td>
<td>10</td>
</tr>
<tr>
<td>PT</td>
<td>Portugal</td>
<td>42.000</td>
<td>28</td>
</tr>
</tbody>
</table>
These two variables, being strictly and equally linked to the two main drivers and scopes of the project are considered to account the 50% each on the calculation of the countries’ score. However their order of magnitude is greatly different and thus, to make them comparable, they are normalized within a scale that ranges from 1 to 10:

<table>
<thead>
<tr>
<th>COUNTRY CODE</th>
<th>COUNTRY</th>
<th>SELL-IN 2015 [units]</th>
<th>CUSTOMERS [#]</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>QA</td>
<td>Qatar</td>
<td>99.000</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td>South Africa</td>
<td>248.000</td>
<td>177</td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>Saudi Arabia</td>
<td>119.000</td>
<td>28</td>
<td></td>
</tr>
</tbody>
</table>

Table 4 – Main STARS markets: sell-in and n° of customers

<table>
<thead>
<tr>
<th>COUNTRY CODE</th>
<th>COUNTRY</th>
<th>SELL-IN 2015 [units]</th>
<th>CUSTOMERS [#]</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AE</td>
<td>United Arab Emirates</td>
<td>2,3</td>
<td>1,0</td>
<td>3.3</td>
</tr>
<tr>
<td>BH</td>
<td>Bahrain</td>
<td>0,2</td>
<td>0,1</td>
<td>0,3</td>
</tr>
<tr>
<td>CH</td>
<td>Switzerland</td>
<td>1</td>
<td>0,2</td>
<td>1,2</td>
</tr>
<tr>
<td>DE</td>
<td>Germany</td>
<td>1,8</td>
<td>2,3</td>
<td>4,1</td>
</tr>
<tr>
<td>DK</td>
<td>Denmark</td>
<td>0,4</td>
<td>1,1</td>
<td>1,5</td>
</tr>
<tr>
<td>EG</td>
<td>Egypt</td>
<td>0,5</td>
<td>0,5</td>
<td>1,0</td>
</tr>
<tr>
<td>ES</td>
<td>Spain</td>
<td>9,1</td>
<td>7,7</td>
<td>16,8</td>
</tr>
<tr>
<td>FR</td>
<td>France</td>
<td>4,5</td>
<td>5,3</td>
<td>9,8</td>
</tr>
<tr>
<td>GB</td>
<td>Great Britain</td>
<td>6,1</td>
<td>4,8</td>
<td>10,9</td>
</tr>
<tr>
<td>IN</td>
<td>India</td>
<td>0,3</td>
<td>0,6</td>
<td>0,9</td>
</tr>
<tr>
<td>IT</td>
<td>Italy</td>
<td>10</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>KW</td>
<td>Kuwait</td>
<td>0,3</td>
<td>0,3</td>
<td>0,6</td>
</tr>
<tr>
<td>LB</td>
<td>Lebanon</td>
<td>0,3</td>
<td>0,2</td>
<td>0,5</td>
</tr>
<tr>
<td>NO</td>
<td>Norway</td>
<td>0,2</td>
<td>0,8</td>
<td>1,0</td>
</tr>
<tr>
<td>OM</td>
<td>Oman</td>
<td>0,1</td>
<td>0,1</td>
<td>0,2</td>
</tr>
<tr>
<td>PT</td>
<td>Portugal</td>
<td>0,4</td>
<td>0,3</td>
<td>0,7</td>
</tr>
<tr>
<td>QA</td>
<td>Qatar</td>
<td>0,9</td>
<td>0,4</td>
<td>1,3</td>
</tr>
<tr>
<td>SA</td>
<td>South Africa</td>
<td>2,3</td>
<td>1,6</td>
<td>3,9</td>
</tr>
<tr>
<td>SE</td>
<td>Saudi Arabia</td>
<td>1,1</td>
<td>0,3</td>
<td>1,4</td>
</tr>
</tbody>
</table>

Table 5 – Main STARS markets: sell-in and n° of customers normalized
As it emerges from the table above the most important country according to the previously defined variables is Italy, followed by Spain, Great Britain, France Germany and South Africa. Then other countries’ scores are slightly distant to these countries, pointing out a quite important gap in terms of business size. Among these five countries five of them share a close geographical location (Italy, Spain, Great Britain, France and Germany are quite nearby among each others), while South Africa is visibly far from the others under a geographical point of view. This causes a potential discrepancy in terms of transportation services to the latter market: given the centrality of Sedico DC for the European countries these are served through couriers, express couriers, and groupage service provider; on the other hand South Africa is served through a combination between a global forwarder (for the international flow) and an express courier (for the local flow). This difference clearly affects the businesses homogeneity and thus the study is further performed with disregard to South Africa.

CLASSES

Nowadays among the 2,993 STARS customers belonging to the time and geographical perimeter of the analysis, 2,799 (94%) are segmented on the basis of their sell-out, and the remainder 194 (6%) on the basis of the trade channel to which they belong. More details, with an overview for the different classes are reported in the table below:

<table>
<thead>
<tr>
<th>SEGMENTATION</th>
<th>CLASS</th>
<th>STORES [#]</th>
<th>STORES [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sell-out</td>
<td>0</td>
<td>97</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>414</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>679</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>1,959</td>
<td>60%</td>
</tr>
<tr>
<td>Trade channel</td>
<td>Boutique</td>
<td>59</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td>Online</td>
<td>22</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Outlet</td>
<td>29</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>DC</td>
<td>10</td>
<td>0%</td>
</tr>
</tbody>
</table>

*Table 6 – STARS stores distribution per class*

It is clearly evident that the focal point of the STARS business is centred on the classes 0, 1, 2 and 3 rather than on classes clustered on the basis on the trade channel. Additionally, given the huge
differences in terms of management of classes and assortments based on the sell-out variable rather than on the trade channel, only customers belonging to former type of segmentation are further taken into account in the following steps.

5.3.2 THE PARAMETERS

Results of the present research are based on the assessment of two min KPIs, that are the Logistics Service Quality, used to assess the quality of the service provided to customers, and the Cost-to-Serve, essential to understand how much the provision of that service costs.

LOGISTICS SERVICE QUALITY

As shown in paragraph 4 the Logistics Service Quality might be influenced by several different parameters and evaluated through a well comprehensive set of KPIs. Nevertheless not all the indicators can be quantitatively and precisely assessed and this might create the opportunity for subjective interpretations. As a consequence, for the purpose of this study, only quantitatively KPIs are considered. Again, as widely discussed in the literature, the KPIs could be selected among a broad set, which consists, for instance on, Order Accuracy, Order Discrepancy Handling, Timeliness, Order Release Quantities, Order to Delivery and on Delivery Frequency, etc., however a further refinement is needed in order not to lose the focus of the analysis. Actually, as extensively described in the previous paragraphs, the purpose of this study is to evaluate Luxottica’s performance over its customers in terms of transportation matters, thus all the KPIs that do not allow to monitor transportation performances and costs will be disregarded. It results that, in order to properly fit Luxottica’s business characteristics, and, more in particular, STARS peculiarities, the Order to Delivery Lead Time (OtD LT) and the Shipping Frequency (SF) are the only KPIs further considered. Indeed on one hand the OtD Lead Time expresses how fast is the Company in serving its customers as soon as they are willing to be served, on the other hand the Shipping Frequency expresses how many times these customers are served. It is crucial to recognize that, if considered alone, these KPIs are quite meaningfulness, while, if considered concurrently, they capture much more significance. Actually in the fashion industry, and especially in the eyewear one, the fast and continuous fulfilment of orders is a crucial matter for Companies and so either the minimization of the OtD Lead Time or the maximization of the Shipping Frequency alone would not be enough to deliver a consistent service: in fact fast replenishments would not have effect if they occur too rarely, and, on the other hand, orders could be also fulfilled on a daily basis, but if they were characterized by a too long cycle time products would become obsolete before they arrival into the store.
ORDER TO DELIVERY LEAD TIME

From a Supply Chain perspective, the Order To Delivery (OtD) process is one of the most important procedures to be managed in a company (Forslund, 2009). It can be considered as a cross-company business process from the customer over the supplier back to the customer. An OtD process starts with the recognition of a need to order and it ends with the product delivery. In general, the major sub-processes involved are (Forslund, 2009):

i. The ordering sub-process at the customer, which starts with the recognition of a need at a certain time and ends when a customer order reaches the supplier;

ii. The production sub-process at the supplier, which starts with the receipt of the order and ends when the goods are available for shipment;

iii. The deliver sub-process, which starts when the ordered goods are available to be picked up and ends when the goods have been unloaded at the customer;

iv. The goods receipt sub-process, which starts when the ordered goods have been received and ends when they are available for use.

The performance of an OtD process traditionally concerns lead time and on-time delivery. Lead time is typically defined “as the time between recognition of the need to order and the receipt of goods” (Forslund, 2009). Moreover the on-time delivery is the extent to which the lead time corresponds to what has been agreed with customers. Generally both the dimensions have an equal weight when evaluating the overall performance, even because they are closely interrelated among each others. More in particular it is generally assumable that the on-time performance strongly depends on the lead time performance: an order delivered with a lead time different from what agreed with the customer, either longer or shorter, can not be considered as on-time.

Given the purpose of the study, that is not concerned with customers’ needs recognition phase, and considering the market characteristics and setups (several shipments and almost daily deliveries of small-sized orders), the importance of a short lead time performance significantly overtakes the prominence of the on-time performance. Exactly for this reason in the present study the OtD process performance is evaluated through the Order to Delivery Lead Time.

In order to proceed with the evaluation of the OtD LT it is necessary to move further in order to understand Luxottica’s process from order receipting to delivery. For sake of simplicity the whole OtD process is summarized in five main consecutive phases:

- The Order Receipt phase is pretty straightforward and it consists in the momentary instant in which an order is placed. Different ways exist for placing an order, such as telephone,
mail and MyLuxottica (the website reserved to opticians); however STARS business model is set for an automatic and scheduled exchange of data between opticians and the Company. It happens that as a pair of glasses is sold in a store the system on its own automatically creates a replenishment order for that SKU. At the end of the day all the orders are consolidated and transmitted to Luxottica via EDI communication;

- The **Order Allocation** phase consists in the process of releasing an order into picking. Generally the orders collected all along the day are allocated during the night and they are sent thus the day later into picking (according to precise rules, such as customers’ priority, order expiration date, fill rates guidelines, etc.). What makes the Order Allocation one of the most critical phases within the OtD process is the weekly shipping calendar that can be considered as a virtual agenda stating what are the weekdays in which an order can be released into picking and thus shipped. Actually in order not to clog the warehouse and to increase picking efficiency not all the orders are allocated each day, but each macro cluster of customers or channels of trade has its own weekly shipping calendar;

- The **Picking** phase consists in the set of physical operations aimed at withdrawing the goods from the warehouse shelves in order to practically assemble an order;

- The **Shipping** phase starts as soon as the picking ends and it is aimed at packaging the orders in order to make them available for the forwarders’ pick-up;

- The **Transport & Delivery** phase is the conclusive step of the process and it basically consists in the pick-up of the freight at the warehouse dock and in its physical movement until the reach of the end customer;

Given the above mentioned Luxottica’s process and considered its main particularities, the **OtD Lead Time calculation model** is developed. The model, aims at pointing out the OtD Lead Time for each combination of weekly shipping calendar and delivery service.
The model considers as inputs:

- The weekly shipping calendar, which states the days in which orders can be allocated;
- A delivery service from the representative DC to the STARS stores equal either to 24 hours, when express couriers are utilized, or to 48 hours, when couriers or groupage service providers are utilized;
- A timeframe of one week, from Monday to Sunday;

The model produces as outputs:

- The Theoretical Shipping Frequency (TSF), calculated taking into consideration the weekly shipping calendar. The TSF ranges from 1 time per week (minimum) to 5 times per week (maximum);
- The average Theoretical OtD Lead Time, evaluated as average between the single OtD LT performances generated for each different weekly shipping day (the OtD LT is evaluated gross of weekends, but net of holydays and other possible, but unforeseeable, causes of delays such as strikes, service provider non-performance, etc.);

To achieve a better understanding of the model it is possible to go through the following example for which, given the weekly shipping calendar for a certain customer with picking (and thus shipping) days equal to Mondays and Tuesdays and a delivery service equal to 24h it is required to calculate the weekly average OtD Lead Time:

- An order placed on Monday would be allocated on Monday night and, under the assumption that it respects all the allocation conditions, it would be released into picking on Tuesday, early morning. On Tuesday, noon time, the picking could be considered as ended, and the order would flow into the shipping area in order to be shipped. Since Tuesday is set in the

Figure 18 – Order to Delivery Lead Time model
weekly shipping calendar as a day favourable to ship the transportation phase begins, and
given the hypothesized delivery service, the order would be delivered the next day within
the standard points of sale working time. Consequently, given the above mentioned
assumptions, an order placed on Monday would have an OtD LT equal to 2 days;

- An order placed on Tuesday would be allocated on Tuesday night and, under the assumption
  that it respects all the allocation conditions, it would be released into picking on Wednesday,
early morning. On Wednesday, noon time, the picking could be considered as ended, and the
order would flow into the shipping area in order to be shipped. However Wednesday,
according to the weekly shipping calendar, is not set as shipping day and thus the order
would wait for being shipped until the next first available shipping day, which is Monday,
week +1. On Monday, week +1, the order would then be shipped and it would be delivered
the next day within the standard shops working time. Consequently, given the above
mentioned assumptions, an order placed on Tuesday would have an OtD LT equal to 7 days.

The exercise continues until, give the above mentioned assumptions, the OtD Lead Time is
calculated for all the possible week days. It results that the Theoretical Shipping Frequency
would be equal to 2 times per week, while the average Order to Delivery Lead Time would last
4.14 days. Then the exercise is extended considering all the other combinations of the weekly
shipping calendar (for a total number of combinations equal to 30) and delivery services (for a
total number of combinations equal to 2). As the model is properly and completely ran it gives as
output the OtD Lead time and the Theoretical Shipping Frequency for 60 combinations of inputs.
As one might expect the model points out that as the delivery service is equal to 24 hours the
OtD Lead Time is shorter in respect to what it would be with a 48 hours delivery service.
However what it is interesting to note is that the advantages to use a faster delivery service are
even more accentuated for certain combinations of shipping days. For instance when the
shipping days are Mondays and Thursdays, and so the TSF is equal to 2 times per week, if a 24h
delivery service is used the average OtD Lead Time is equal to 3.29 days, while with a 48h
delivery service a 5.14 days of OtD Lead Time would be achieved. The reason behind this huge
discrepancy is that the model considers the OtD Lead Time as gross and so the KPI itself is
strongly impacted by mutual occurrence of shipping days and non-working days.
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<td>5</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>4,43</td>
<td></td>
</tr>
</tbody>
</table>

*Table 7 – Order to Delivery Lead Time calculation model*
Table 7 shows all the possible combinations of inputs in the OtD LT model and it can be read in the following way:

- The first column indicates the delivery service;
- The second column denotes the time frame, equal to one week. This column is then further segmented into seven sub-columns, where each of them is assigned to a week-day. Days highlighted in light blue are the shipping days, while days highlighted in light grey are non-working days. Numbers within days’ cells represent the OtD Lead Time that orders would incur in if generated in the corresponding day;
- The third column represents the Theoretical Shipping Frequency;
- The fourth column points out the average Order To Delivery Lead Time. Green-highlighted OtD Lead Times are the shortest possible (given a certain combination of inputs), while red-highlighted OtD LT are the longest possible (given a certain combination of inputs); if OtD LT are not highlighted there are no differential performances given the inputs combination;

**SHIPPING FREQUENCY**

As pointed out in paragraph 4 the Shipping Frequency consists in one of the most important indicators to evaluate the Logistics Service Quality, and together with the OtD Lead Time it gives a clear picture of how customers are served promptly.

Given the structure of Luxottica’s business, and the steps of the above mentioned OtD process it is possible to discriminate between:

- **Theoretical Shipping Frequency (TSF)**, evaluated on the basis of how many times within a certain time band the orders placed by a store are expected to be allocated, picked and then shipped out;
- **Actual Shipping Frequency (ASF)**, evaluated on the basis of how many times the orders placed by a store have been actually allocated, picked and shipped out;

More in practical, as discussed in the previous paragraph, the Theoretical Shipping Frequency originates from the weekly shipping calendar, while the Actual Shipping Frequency results from the impacts of contingent events on the TSF. Practical evidence over Luxottica’s processes and business shows that there are three main sources of contingent events, and that they are imputable to:
- **Holydays**: the weekly shipping calendar is set-up for shipping in certain week-days (differentiated according to all the 26 weeks of high season and the remainder 26 weeks of low season). It might result that, over weeks, shipping days take place exactly at the same time of holydays, in which the Distribution Centre is closed. If so the order receipt and allocation phases are carried out, but the picking and shipping steps can not be practically performed;

- **Customers and orders**: orders might be subjected to commercial policies or to expiration rules that, if not effective, prevent the orders to be allocated. Additionally customers might be exposed to commercial/credit blocks due to missed payments or other causes. Again, if it happens, Luxottica does not allocate the orders coming from that customers even though they were scheduled in the weekly shipping calendar;

- **Warehouse and stock**: the fulfilment of orders is strongly linked to stock and SKUs availability that, even if rarely, might not be sufficient for satisfying the fill rate. Indeed, if the minimum fill rate is not achieved the system automatically holds the order from picking. In addition the workload capacity (both human and technological) might act as constraint: in fact, even if order are released into picking since they satisfy the above mentioned conditions, it might not be sufficient to successfully complete the picking and/or the shipping phase;

- **COST TO SERVE**

  Until now only aspects related to service level to customers have been considered; however, given Luxottica’s nature of profit-oriented company, business profitability is understandably considered a primary objective for the Company, which is always seeking, in addition to optimal service provision, for cost-effectiveness maximization. Luxottica, as almost all the other for profit companies, defines profitability in economics terms as the difference between revenues and costs; it means that in order to achieve its objective the Company has either to maximize revenues or to minimize costs, or both of them concurrently. In Luxottica these goals are addressed in different ways to the each single business unit: indeed if in one hand all the functions can achieve a cost reduction by reviewing their expenses, on the other hand not all of them can be considered able to increase their margins. Actually business units such as Logistics, that are devoted at providing services, are considered to be a cost driver instead of revenue makers. In reality Logistics, delivering the right product at the right time in the right place, is a
crucial functions for supporting sales and thus for revenues generation, nevertheless since it
does not have a direct impact in creating incomes, for the purpose of this dissertation, it is
considered as affecting costs only. Under this assumption Logistics costs and Cost-to-Serve
customers are thus further analysed into more details in this section.

Generally Logistics cost can be grouped in five main different macro-categories:

- **Transportation costs**, which are the costs sustained for moving the goods from the point of
  origin to the point of destination;

- **Warehousing costs**, which are the costs sustained in order to physically store, handle,
  package and label the goods;

- **Customer service costs**, which encompass the costs sustained for receiving and processing
  the orders from the customers;

- **Inventory carrying costs**, that include the costs of holding goods in inventory such as
  capital, warehousing, depreciation, insurance, taxation, and obsolescence, and are
  commonly expressed as a share of the inventory value;

- **Administration costs**, that include all the overheads;

According to the Council of Supply Chain Management Professionals the incidence of cost
items varies across industries and geographies, however, on average, transportation costs
amount to the 47% of total Logistics costs, while, inventory carrying costs to 24%, then
warehousing costs to 22%, customer service costs to 4% and finally administration costs to 3%.
Given the average huge impact of transportation costs over the total Logistics expenses and the
emphasis of the present study over the transportation step of the order fulfilling process, they are
considered as the main driver for analysing the Cost-to-Serve. Consequently, in order to
understand which are the operational as well as the managerial levers that can be touched in
order to act on transportation costs it is crucial to understand how these costs are built, or, in
other words, which is their structure. Transportation cost structure generally varies on the basis
of the typology of service provider: on one hand there are couriers and express couriers, on the
other hand there are groupage forwarders and global forwarders. For what concerns Luxottica
STARS channel of trade, as expressed in the following 5.2.2, the majority of customers are
served through either couriers or express couriers, as a consequence the cost structure of this
kind of service providers is examined on details.
Worldwide all the shipping couriers base their shipping rates on a variety of factors including the package volume-weight (shipping profile), the departing and the destination country and some accessorial services such as the tracking and the insurance options. With reference to the geographical perimeter of the present study presented in paragraph 5.3.1, all the STARS customers comprehended in the analysis share the same departing country (Italy), while they are located in different countries and may have different shipping profiles. As a result shipping rates are influenced only by the package volume-weight and by the destination country, and they, on a country basis, are constructed as follows:

<table>
<thead>
<tr>
<th>SHIPPING PROFILE [Kg/shipment]</th>
<th>RATE [€]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 0.5</td>
<td>$X$</td>
</tr>
<tr>
<td>0.5 – 1.0</td>
<td>$X + \frac{X}{5} = 1.2X$</td>
</tr>
<tr>
<td>1.0 – 2.0</td>
<td>$1.2X + \frac{X}{6} = 1.37X$</td>
</tr>
<tr>
<td>2.0 – 3.0</td>
<td>$1.4X + \frac{X}{7} = 1.51X$</td>
</tr>
<tr>
<td>3.0 – 4.0</td>
<td>$1.6X + \frac{X}{8} = 1.64X$</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
</tr>
</tbody>
</table>

Table 8 – Couriers and express couriers and couriers rate

As the table above suggests the rate increase is less than proportional in respect to the shipping profile increase, and the gap between the two items grows along with the increase of the shipping profile. In other words it means that as the weight of a shipment doubles the rate growth less than the double (this equation holds, even if subjected to different percentages increases, whichever the combination of origin and destination countries). Practically the transportation of a shipment consisting of the frame $i$ for an hypothetical total weight of 0.39 Kg would cost $X$ while the transportation of a shipment consisting of $2i$ frames, for an hypothetical total weight of 0.78 Kg would cost $1.2X$. It means that the cost to serve one customer with the frame $i$ alone would be $X$ per frame, while the cost to serve the same
customer with two frames \( i \) together would be 0,6\( X \) per frame. Consequently it is clearly evident the greater the shipment, that is the higher the number of pieces in the same shipment, the lower the cost to serve the customer.

Larger shipments can be obtained by increasing orders size and thus by either reducing the Theoretical, and thus Actual as well, Shipping Frequency or by increasing the sell-in to customers. As presented in paragraph 4 the TSF is a proxy of the service level offered to the customer, that if too disrupted might generate a potential lost sale (as soon as the Company decides to reduce the replenishment frequency of customers in order to achieve a lower Cost-to-Serve, the likelihood of fulfilling on time an order decreases and consequently the possibility to increase the sell-in decreases). In addition, if in one hand the TSF can be considered an endogenous – Luxottica has full ownership of the leverages to act on it – variable, on the other hand the sell-in has to be considered as an exogenous one. Actually the latter is strongly driven by customers’ sales that can be surely influenced by Luxottica through instruments such as marketing campaigns, promotions, and commercial policies as well, but these instruments act only in the long term. In other words it means that, in the short-medium term, given the sell-in, the Theoretical Shipping Frequency is the only variable through which the Company can adjust the Cost-to-Serve (practically also couriers’ rates can be considered as a driver for determining the cost to serve, but they are a steady variable that can not be impacted by substantial increases/decreases in the short term). In particular the relation between TSF and sell-in gives origin to the so-called shipping profile, which consists in the average orders size and is evaluated for each single customer.

Given the above mentioned assumptions (the larger the shipment the lower the Cost-to-Serve), the Cost-to-Serve can be qualitatively assessed by looking at the shipping profile, and thus by looking at the mutual relationship between sell-in and Theoretical Shipping Frequency. The Cost-to-Serve is qualitatively expressed in the table below:

<table>
<thead>
<tr>
<th>SELL-IN</th>
<th>LOW</th>
<th>HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>LOW</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>HIGH</td>
<td>HIGH</td>
<td>LOW</td>
</tr>
</tbody>
</table>

*Table 9 – Cost-to-Serve qualitative assessment*
- **Low Cost-to-Serve customers** are those customers characterized by a well-balanced relationship between TSF and sell-in. It means that they either generate few volumes being served few times or they generate high volumes being served numerous times and thus the average weight of their shipments falls into a favourable rate;

- **High Cost-to-Serve customers** are those customers characterized by a negatively outbalanced relationship between TSF and sell-in. It means that they generate few volumes being served numerous times, and thus the average weight of their shipments falls into an unfavourable rate;

- **Very low Cost-to-Serve customers**, are those customer characterized by a positively outbalanced relationship between the TSF and sell-in. It means that they generate high volumes being served few times, and thus the average weight of their shipments falls into a very favourable rate;

In conclusion the Cost-to-Serve can be assessed through the combination between the Theoretical Shipping Frequency and the sell-in and. Consequently the “Cost-to-Serve ratio” can be defined as the cost per unit sustained by Luxottica to serve one customer given a certain shipping profile. The Cost-to-Serve ratio (CtSr) can be quantitatively evaluated through the following formula:

\[
CtSr = \frac{\text{Weekly sell - in}}{\text{Weekly Shipping Frequency}}
\]

Given that equation assuming a fixed weight per unit and idealizing a possible rate table, the Cost-to-Serve ratio can be graphically depicted in the following way:

---

**Figure 19 – Example of Cost-to-Serve ratio path**
It is clearly evident that as soon as the number of units per shipment increases the Cost-to-Serve ratio decreases and even though figure 20 evidences that relationship till a shipment composed by 16 units it is assumable that the decreasing trend holds its validity also for larger shipments until the maximum shipments’ size is reached. However, given couriers’ and express couriers’ rate structure toward Luxottica and the Company’s business set-up considered in the present dissertation, that maximum weight and dimensional thresholds are supposed not to be reached.
6. THE ANALYSIS OF LUXOTTICA LOGISTICS CUSTOMER SERVICE

6.1 THE AS IS LOGISTICS CUSTOMER SERVICE

The AS IS analysis is conducted in order to pinpoint firstly the overall set-up of the actual business and then in order to assess the value of the chosen KPIs. That assessment is carried out considering a general perspective and looking at the entire perimeter discussed in paragraph 5.2.1 without focusing on a country by country perspective.

6.1.1 PERIMETER OVERVIEW

The 2,799 STARS stores within the previously identified perimeter are distributed, per country and per class, as follows:

As it emerges from the figures reported above Italy is the country with the largest number of stores: this is mainly due to the fact that STARS business model was launched firstly in Luxottica’s home country. On the other hand Germany, due to the novelty of the STARS channel of trade, is the country in which the business is less diffused. Additionally, from a class point of view, the majority of stores belongs to the class 3, on the other hand there are few stores in the class 0. This subdivision reflects the connotations of exclusivity and high-end assortments typical of class 0 and the need to have only few selected stores for these kinds of luxury and prestigious brands.

Despite the mere distribution of stores in terms of number of physical locations, a more understandable picture of the business is pointed out through the assessment of volumes shipped to
stores. Given the 1,729 stores of class 3 it is reasonable to expect they generate the largest part of the business, however, this assumption can be partially offset by the relevant turnover in terms of pieces generated by the top-sellers of class 0. Figure 22 graphically expresses these numbers.

From a service perspective most of the French, German, Italian, Spanish and UK customers are served with couriers (80% of overall volumes), additionally some huge customers are served also through groupage service providers (13% of overall volumes) and finally the remainder part (7% of overall volumes) through express couriers. Disregarding the customers served with groupage service providers, for which orders’ size justifies this type of service, it emerges that there is no a fully understandable rationale behind the decision to serve a customer either with express or with standard couriers. In other words it might be that the Company is not using the most appropriate service for all its customers: this set-up currently is not leading customers to complain or deliveries not to be performed with an acceptable OtD Lead Time (since, at most, an order is fulfilled, from a transportation point of view, in 48 hours), but it might further optimized. Moreover the choice of the delivery service is not driven by the class in which the STARS store is located.

6.1.2 PARAMETERS OVERVIEW
In this section of the dissertation all the parameters (KPIs) identified on paragraph 5.5 are assessed and valued on the basis of the AS IS way in which business is conducted.

ORDER TO DELIVERY LEAD TIME
According to the geographical and temporal perimeter of the analysis the Theoretical and Actual Order to Delivery Lead Time per class weighted on sell-in volume and evaluated in number of days, are reported in the graph below (figure 22). It results that the Theoretical OtD Lead Time (TToD LT), for each class and with an almost constant trend, is lower than the Actual OtD Lead Time. More in particular the average Theoretical OtD LT is equal to 3,71 days, against the Actual one that values 3,91 days.
In addition both an intra-classes and inter-classes analysis can be performed:

1. Considering an intra-classes perspective the differences between the Theoretical OtD LT and the Actual OtD LT are almost null. Indeed, on average, the difference between the two is 0.20 days, with a maximum of 0.44 days for class 3 and a minimum of 0.09 days for class 2, with a standard deviation of 0.18 days;

2. Considering, on the other hand, an inter-classes analysis the differences between the Theoretical OtD LT and the Actual OtD LT are evident. Actually, the trends of both of them are similar and from a minimum Theoretical OtD LT equal to 2.61 days, observed for class 1 and the maximum one, observed for class 3 and equal to 5.11 days, there is a gap of 2.06 days (the gap between the Actual OtD LT for the same classes equals to 2.39 days);

From that analysis it results that, on average, the Company is performing as it intended to do: the small gaps between intra-classes TOtD and AOtD Lead Times are negligible and they are mainly ascribable to the causes previously expressed in 5.3.2. On the other hand, the analysis clearly points out that customers are served with extremely heterogeneous OtD Lead Times on the basis of the clusters in which they are classified. Gaps between Actual as well as Theoretical OtD LT among classes might be well explained by the OtD Lead Time Model according to which the OtD LT is influenced in a limited manner by the shipping days, while huge discrepancies might be created by the match between delivery service and Shipping Frequency (for instance, considering the shipping frequency and shipping days as constants and respectively equal to 2 times/week and Thursday and Friday, the usage of a 48h Delivery Service strongly impacts in the TOtD LT moving it up to 7.14 days).
days rather than 4.43 days when a 24h Delivery Service is utilized, for an overall increase of 62%). The validity of that assumption is systematically proved through the analysis of the different combinations within the OtD LT model, which depict that the increase in the OtD LT goes along with the reduction of the Shipping Frequency. Additionally the almost negligible gaps among OtD Led Times within the same class reinforce the validity of the OtD Lead Time model.

**SHIPPING FREQUENCY**

Given these premises and the FY 2015 historical data about the countries and the stores under analysis, the Theoretical and Actual Shipping Frequencies per class weighted on sell-in volume and evaluated in number of shipments per week, are reported in the graph below:

![Graph showing Theoretical and Actual shipping frequency per class](image)

It results that the TSF is, for each class and with an almost constant trend, higher than the ASF. More in particular the overall Theoretical Shipping Frequency is equal to 3.44 times per week, while the Actual values 2.46 times per week, were a week is considered to be composed, on average, by 5 days (from Mondays to Fridays – all and only the days in which the DC is able to pick and ship –). On average the difference between TSF and ASF is 0.98 times per week, with a maximum of 1.08 times per week for class 2 and a minimum of 0.86 for class 1 (standard deviation of 0.095). The exact and accurate analysis of the actual causes leading to this discrepancy can be considered as outside the perimeter of that study and for this reason they will not be scrutinized further in respect to what disserted above in paragraph 5.3.2. Other than the differences between Actual and Theoretical Shipping Frequencies, what can be further analysed is how these frequencies vary across the different STARS classes. One might expect Shipping Frequencies to be in line with classes: being classes created on the basis of the sell-
out it is reasonable to believe that greater sellers are served more frequently in respect to smaller sellers. In other words it is expectable to see a TSF almost close to 5 times per week for class 0 and then to see it arranged differently class by class until it reaches about 2 times per week for class 3.

What actually emerges is that, as predicted, the TSF of class 0 is very close to 5 times per week, however it is also true that the TSF of class 1 and 2 are very close among each others and not far from the almost 5 times per week of class 0. In fact the marked cut of TSF takes place only passing from class 2 to class 3, where the KPI decreases more than 1 time per week. The Actual Shipping Frequency follows the same trend, remaining steady and between 3,61 and 3,11 times per week for classes 0, 1 and 2, and decreasing strongly as far a class 3 is concerned.

In conclusion the analysis shows two main phenomena: on one hand, with an intra-class perspective little discrepancies between Theoretical and Actual Shipping Frequencies can be highlighted; on the other hand and it seems that both TSF and ASF are not driven by the class. As a consequence a separate deep dive on both phenomena has to be carried out.

From one side Shipping Frequencies can be further studied according to their distribution and for a start the part of the volume, in percentage terms, that should have been delivered with a certain Theoretical Shipping Frequency, and that, instead, has been actually shipped with an Actual Shipping Frequency is reported in the graph below:

![Graph showing Theoretical and Actual sell-in per Shipping Frequency](image)

*Figure 25 – Theoretical and Actual sell-in per Shipping Frequency*

From that graph it results that the 25% of the volume was planned to be shipped with a Theoretical Shipping Frequency of 5 times per week, the 28% with a TSF of 4 times per week, and so on until the 10% of volumes with a TSF of 1 times per week. It results that roughly the 53% of volumes was planned to be shipped more than 3 times per week. On the other hand it is clearly visible that the
Actual Shipping Frequency follows a totally different pattern in respect to what forecasted: actually only the 43% of the volume has been shipped with the planned frequency, while the 57% has been delivered with a shipping frequency different from what planned. The outcome is quite marked and easily understandable: perform an average of 5 shipments per week is a highly hard task in reality since it would require an impeccable set of conditions, such as the absence of credit blocks and of production/logistics back order and the perfect balance and pace of warehousing activities, that are barely achievable all together in the same time. On the other hand the probability that an order is fulfilled (i.e. the probability that all the conditions avoiding the fulfilment of an order do not occur) increases as soon as the number of occasions in which the above mentioned set of conditions has to hold. In other words, with data on hands, if the TSF is set at 5 times per week there is a 12% of probability to match it, while if the TSF is 4 times per week the probability increases up to 61% and finally becomes almost 100% if the TSF is equal to 3.

In conclusion this side of the analysis highlights that the higher the TSF the lower the probability to achieve it; and additionally it provides the clear proof that a Theoretical Shipping Frequency of 3 times per week (or less) is a condition that can be achieved easier than when the TSF is equal to 4 or to 5 time per week.

An attempt to better explain the distribution of the shipping frequencies is reported in the graph below. It represents the percentage (on the axis) or the number (on the columns) of stores for each class that have been planned to be served with a certain Theoretical Shipping Frequency:

**Figure 26 – Theoretical Shipping Frequency distribution per class**
The graphs clearly depict that Theoretical Shipping Frequencies are strongly heterogeneous within the same classes. Indeed it does not exist a class in which all the stores (or, at least, the majority of them) have been planned to be shipped with the same number of occurrences per week. For instance in class 0 there are 5 stores that have been planned to be shipped 1 time per week, 8 that have been planned to be shipped 2 times per week, 17 that have a Theoretical Shipping Frequency of 3 times per week, etc.. The same reasoning can be done the other classes as well. The misalignment between classes and Theoretical Shipping Frequencies might be explained by the fact that some stores have been included in the wrong class. This may happen because clusters are updated once a year and because the sell-out of stores might substantially vary all along the year. Thus it results that stores, given their historical and especially previous year sell-out are inserted in a certain cluster for the year to come, but then they under-perform/over-perform not respecting anymore the boundaries of the class and requiring thus a class downgrade/upgrade. However, according to the figures of graph 25 the extent of the phenomenon seems to be quite huge for being justified by a misalignment between consecutive years performances and thus it might be ascribable to an incorrect and disregarded utilization of classes.

In conclusion, from an overall point of view, it emerges that there is no a clear link between classes and Theoretical Shipping Frequencies and thus that current classes are not intended to be a driver for the TSF. Additionally the discrepancies between ASF and TSF can be partially explained by the contingent event typical of the business.

**COST TO SERVE**

As expressed in paragraph 5.3.2, to understand customers’ Cost-to-Serve it is possible to assess their shipping profile’s Cost-to-Serve ratio. On this purpose Figure 27 shows, on a class basis, both the Theoretical and the Actual Cost-to-Serve ratios. Apart from the gaps between the Theoretical and Actual KPI, that are due to the discrepancies between the ASF and TSF already highlighted in Figure 24, the CtSr value on a class base follows an unexpected trend: class 0, that is generally assorted with premium and high-end brands, is characterized by the lowest CtSr (both Theoretical and Actual), while class 3, that is generally provided with medium-end brands, is served with the highest CtSr (both Theoretical and Actual). In other words, from a first overview, it seems that the cost to serve a class whose sales needs to be supported in the best possible way is lower than the cost to serve a less valued class with direct consequences in terms of service: to a lower Cost-to-Serve it should correspond a less performing transportation service.
Moreover one might believe that the high CtSr is impacted by the Shipping Frequency mostly and thus, to a high CtSr it should correspond a high Shipping Frequency and consequently a prompt and on-time service. However, going further in the analysis, it has to be evidenced that the Cost-to-Serve ratio origins from the shipping profile and thus by the ratio between the sell-in and the Shipping Frequency. As a consequence the low CtSr typical of class 0 can be explained by a favourable shipping profile. Besides, given the findings expressed in Figures 21, 22 and 24 that mix together the number of stores per class, the sell-in per class and the Shipping Frequency per class, numbers displayed on Table 10 express the shipping profile per class:

<table>
<thead>
<tr>
<th>CLASS</th>
<th>THEORETICAL SHIPPING PROFILE [units/shipment]</th>
<th>ACTUAL SHIPPING PROFILE [units/shipment]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>14,29</td>
<td>18,37</td>
</tr>
<tr>
<td>1</td>
<td>9,41</td>
<td>11,70</td>
</tr>
<tr>
<td>2</td>
<td>7,31</td>
<td>9,85</td>
</tr>
<tr>
<td>3</td>
<td>4,57</td>
<td>6,82</td>
</tr>
</tbody>
</table>

These figures clearly evidence that fluctuations in the Cost-to-Serve ratio are due to the different shipping profiles (irrespectively whether Theoretical or Actual, since their trends are similar). It means that there could be two main actions available to optimize the actual set-up of the business:

- Under the assumption that the maximum Theoretical CtSr, equal to € 4.50 per unit, is acceptable there could be room for improving the service to customers of the other classes.
by either increasing their shipping frequency or by granting them a 24 hours delivery service, or both of them;

- Under the assumption that the maximum Theoretical CtSr, equal to € 4.50 per unit, is not acceptable there would be the need to revise the services offered to customers clustered in class 3 and to study as well also the services offered to the other customers in order to reach a well-balanced portfolio of services.

6.1.3 MAIN FINDINGS

As far as the analysis of the AS IS Luxottica’s logistics customer service is concerned three main conclusions can be drafted:

1. **Classes are not intended to support Logistics activities.**
   Classes are built on the basis of the sell-out, which is a purely commercial variable. More in particular, since the sell-out considers only the units sold by a store net of returns performed by opticians to Luxottica, it can be used only to gain an order of magnitude of the sell-in, which on the other hand is a logistics variable. Indeed opticians, according to Company’s rules about commercial returns, might decide to free their obsolete stock shipping it back to Luxottica part of the SKUs they have in store. It results that even if these SKUs have been shipped to stores impacting logistics they are not counted in the sell-out, while they would have been considered in the sell-in. Additionally it has been proved that a clear relationship between classes and Theoretical Shipping Frequency does not exist;

2. **Differences among Theoretical and Actual Shipping Frequency can not be always addressed to manageable events.**
   As far as Luxottica’s Order to Delivery process is concerned the gaps between ASF and TSF generally arise in the phases between the order allocation and the transport and delivery steps, which are characterized by contingent and unforeseeable events. Actually unavailability of stocks on the shelves, under/over exploitation of picking, packaging and shipping capacity, other capacity constraints and customers’ prioritization might strongly impact the orders fulfilment, leading to an Actual Shipping Frequency different from the Theoretical one. These disruption elements, even though crucial for the purpose of the business, are not further discussed in the following sections. Additionally also causes totally independent from Luxottica’s behaviour can also become a driver of the gap between the ASF and the TSF: for instance customers’ behaviour, such as the payment fulfilment or the
order placement policy can influence the possibility to ship, reducing thus the Actual Shipping Frequency. Even more so these causes are not studied in this dissertation;

3. **Customers’ Cost-to-Serve strongly depends on the shipping profile.**

The combination between customers’ Theoretical (and Actual) Shipping Frequency and their sell-in is the main driver of the Cost-to-Serve, and they have to be properly balanced in order to obtain a valid and meaningful Cost-to-Serve ratio.

### 6.2 Toward the To Be Logistics Customer Service

During the analysis of the current status of Luxottica’s logistics customer service for STARS customers, and the given the outputs of the exploration, some clues on how to improve the current way of doing business are emerged. All of them are related only to the manageable events (it would be impossible to improve something that is not on improver’s hands) and they are linked to the two main aspects arose when analysing the STARS logistics customer service status and subsequently wrapped-up in drawing the conclusions of the AS IS scenario: the improvement of customers’ classification and the opportunity to work on the customers’ Cost-to-Serve ratio in order to further optimize the service provision.

#### 6.2.1 Improvement of Customers’ Classification

As it has been widely described in paragraph 6.1.2 nowadays classes are built on a purely commercial variable such as the sell-out, rather than on a logistics variable. Additionally, in the current setup, each country is supposed to have its own rules to set the parameters for building classes. As a result the improvement of customers’ classification has to pass through:

1. The selection of the **driver** on which to base classes together with general rules to understand if and were to place exceptions;
2. The identification of the **geographical coverage** of classes to deep-dive the possibility of reducing the diversity existing nowadays;
3. The choice about the **number** of classes that suit the most the business scenario;
4. The selection of the classes’ **boundaries** that best represent the market;

#### Classes Driver & Geographical Coverage

As per the outcomes expressed in paragraph 6.1.2, in the AS IS set-up of STARS business, classes are built on the basis of the sell-out as well as some other quali-quantitative variables. Other than
that their scope is to help planners in addressing the right assortment of products to the right store typology. On the other hand logistics does not have in place any kind of classification for that business typology and this finds its origins from the fact that the whole STARS business has been generally always treated with the highest possible priority for the Company. However, over years, the business has evolved and new opportunities are emerged creating the possibility for Luxottica to carry out an intra-business classification to allow delivering a logistically differentiated service to its customer base.

As a result, in order to define the pillars of the TO BE scenario, rules by which classes are created have been simplified and the usage of a single quantitative variable rather than a mix of qualitative and quantitative ones has been enforced. In so doing the classification would follow always the same rule without leaving rise to ambiguity and making its understanding simpler. More in details it has been decided to consider the sell-in as the new segmentation variable: practically the sell-in consists in the number of pieces shipped to a certain store, and it is preferred to the sell-out since the latter does not consider the pieces returned to Luxottica that, anyway, have been shipped to that store. On top of this decision it has been guaranteed the possibility to freely classify 10 stores per macro-region that can be manually inserted in whatever class by STARS planners. This choice has been driven by the necessity to match customers’ requirements: on one hand customers located in prestigious locations may need to be served with special care even though they do not generate a huge sell-in since they are intended to act as showcases for the Company; on the other hand there might be stores that prefer to receive few consolidated shipments rather than daily deliveries that would be probably assigned to them given their consistent and remarkable sell-in.

In parallel with the definition of the new driver also the geographical scope of classes has been revised. The geographical scope consists in the number of countries over which the same set of clusters can be applied. Actually, given the macroeconomic differences and the dissimilar maturity stages reached by STARS channel of trade in the different countries analysed the idea to build a set of classes for each different country has its own cornerstone. However this choice compromises the uniformity of the model and increases the future management complexity of the business. As a consequence, given the trade-off between the opposite needs of complexity reduction and market accuracy, two homogeneous areas have been defined:

a. Italy, France and Spain;

b. Germany and UK;
According to Table 4, Italy, France and Spain represent the countries in which the business is more developed; it is thus assumable that, given the similarities between the number of stores and the yearly sell-in, customers’ needs and shipping profiles would be somehow similar. Additionally these countries, from a service point of view, are served in a very similar way: even though forwarders are different all of the countries share a road service in which deliveries are carried out by a local courier that, exploiting the large market knowledge and coverage, is able to deliver a consistent service. On the other hand Germany and UK are served by the same supplier and according to the same ground service. Additionally in these two countries the relatively novelty of the business results in a more fragmented customer base thus creating the need of fulfilling different shipping profiles.

**NUMBER OF CLASSES AND BOUNDARIES**

In order to guarantee a manageable level of complexity in the TO BE scenario the numerousness of classes is intended to be the same for each homogeneous area and that number is driven mainly by business needs. Actually, from a business point of view it is not possible to serve a customer less than 2 times per week and, understandably, it has no sense to serve customers more than one time per day. Given that four classes are then created, each of them characterized by a certain Theoretical Shipping Frequency:

<table>
<thead>
<tr>
<th>CLASS</th>
<th>TSF [shipments/week]</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
</tr>
</tbody>
</table>

*Table 11 – New logistics based classes and TSF*

The rationale behind the link of class A with a Theoretical Shipping Frequency equal to 5 times per week bases its motivation on the idea that part of the business has to be served constantly in order to support its sales. On the other hand class D is characterized by a Theoretical Shipping Frequency of 2 times per week, which even though representing the lowest one in the whole business case, it is assumed to be sufficient for avoiding service disruption to customers. Between these two upper and lower bounds class C and B are associated to a Theoretical Shipping Frequency of 3 and 4 times per...
week respectively in order to raise-up the level of service of the overall business and allow to consistently manage the Cost-to-Serve ratio by balancing classes’ boundaries.

Given the four classes the boundaries are then defined, for each group of countries, according to two main rules:

a. The set of customers generating the 20% of the sell-in are grouped together and inserted in class A;
b. The other customers, able to generate the remainder 80% of sell-in are then further segmented according to an ABC analysis;

- **ITALY, FRANCE AND SPAIN**

The set of countries composed by Italy, France and Spain engenders a sell-in equal about to 2,900,000 pieces overall, and the 20% of this sell-in is generated by 53 stores. All of these stores, as disclosed above, are inserted in class A. In so doing business leaders are supposed to be served with the highest service possible and their sales will be sustained even the re-layout of classes has occurred.

The remainder part of 2,082 stores, accounting for about the 80% of the business, are then segmented with an ABC analysis, which considers three classes:

- Class B is the class providing the 50% of the sell-in, and it consists of the 23% of stores;
- Class C is the class providing the 20% of the sell-in, and it consists of the 29% of stores;
- Class D is the class providing the 10% of the sell-in, and it consists of the 46% of stores;

![Figure 28](image-url) – Italy, France and Spain, stores and sell-in
GERMANY AND UK

Germany and UK together engender a sell-in equal about to 440,000 pieces overall and the 20% of this sell-in is generated by 35 stores. All of these stores, similarly to what has been done for the other macro-region, are inserted in class A.

The remainder part of 664 stores, accounting for about the 80% of the business are then segmented with an ABC analysis, which considers three classes:

- Class B is the class providing the 70% of the sell-in, and it consists of the 24% of stores;
- Class C is the class providing the 20% of the sell-in, and it consists of the 36% of stores;
- Class D is the class providing the 10% of the sell-in and it consists on the 40% of stores;

Going into more details and comparing the outcomes of the segmentation for the two macro-regions it is evident that the German and UK markets are heavily fragmented if compared to Italian, French and Spanish ones. Actually in the former geography the 20% of sell-in (class A) is engendered by the 5% of stores, while for the latter set of markets the same 20% is produced by the 2% of stores. This evidences how, in Italy, France and Spain there are few stores leading the market and able to consistently drive the sales of the overall region. Then, with regards to the other classes (B, C and D) the results are pretty similar, with class B providing the 50% of market’s sell-in and characterized by the 23% and by the 21% of stores for Italy, France and Spain and for Germany and UK respectively. A similar trend is depicted for class C and D as well, and, in conclusion, apart
from class A the two macro regions seem to have a similar market structure path. A detailed recap is showed on Table 12:

<table>
<thead>
<tr>
<th>MACRO-REGION</th>
<th>CLASS</th>
<th>SELL-IN</th>
<th>STORES</th>
<th>TSF [shipments/week]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italy, France and Spain</td>
<td>A</td>
<td>20%</td>
<td>2%</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>50%</td>
<td>23%</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>20%</td>
<td>29%</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>10%</td>
<td>46%</td>
<td>2</td>
</tr>
<tr>
<td>Germany and UK</td>
<td>A</td>
<td>20%</td>
<td>5%</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>50%</td>
<td>21%</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>20%</td>
<td>32%</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>10%</td>
<td>42%</td>
<td>2</td>
</tr>
</tbody>
</table>

*Table 12 – Details of new classes per macro-region: sell-in, stores and TSF*

On top of this classification, as previously highlighted, there could be the possibility upon STARS planners’ request, to revise the clustering and change the classification of maximum of 10 stores per each macro-region. Even though this request might outbalance the clustering outcome it is believed not to turn upside-down the overall model and, furthermore, it is something that has to be managed for a great fine-tune of the project. Actually the present study is dedicated on enhancing the service provision to customers and, as a matter of fact, carrying out a purely mathematical exercise disregarding the business needs might occasionally lead to counterproductive results. As a consequence the cross-functional dialogue with STARS planners had led to a slight review of 4 stores within the macro-region composed by Italy, France and Spain and by 8 stored for the other geographical perimeter. This minor change, after being approved by STARS Logistics Customer Service, has been included in the business case and taken into consideration for the next steps of the project.

**6.2.2 CUSTOMERS’ COST-TO-SERVE**

The new classification based on a logistics variable, the linkage of a Theoretical Shipping Frequency to each class and the classes’ volumes, both in terms of sell-in and in terms of stores, arranged the possibility to start considering the Cost-to-Serve. The revision of the Cost-to-Serve has to pass through:
1. The evaluation of the new **shipping profile** typical of each class and diversified for each macro-region;
2. The understanding of the most favourable **shipping calendar**, given the TFS;
3. The assessment of the **delivery service**, the main driver of the Cost-to-Serve ratio;
4. The evaluation of the **Order to Delivery Lead Time**;

**SHIPPING PROFILE**

The new classification of customers and the new perimeters of classes lead to a modification of the average shipping profile that has to be carefully evaluated in order to make the assessment of the Cost-to-Serve ratio possible. The shipping profile is evaluated again as the average weekly number of pieces per shipment and per store and even though differentiated by class, it has been evaluated in parallel for Italy, France and Spain, and for Germany and UK:

![Figure 30 – Shipping profile per macro-region and per class](image)

From Figure 30 it is greatly evident how the shipping profile varies on a macro-region base and, additionally, class by class within the same region. The greatest figure regards the macro-region composed by Italy, France and Spain, were moving from the 261.95 pieces per shipment per store per week of class A to the 58.02 pieces of class B, the shipping profile decreases for about the 78%. Additionally a huge discrepancy is also highlighted always with regard to class A between Italy, France and Spain’s shipping profile and Germany and UK’s one: the difference between the two is close to 80%, and this gap is well explained by the different maturity stages reached in the markets and by the strongly diverse size of the players, both of them leading to different sell-in volumes.
SHIPPING CALENDAR

The understanding of the best performing shipping calendar is something that does not have direct impact on the Cost-to-Serve ratio, however it allows skimming, given the Theoretical Shipping Frequency associated to the different classes, the best combinations of shipping days and delivery service that, in turn, have a direct impact on the Cost-to-Serve ratio. As a consequence, given each class – and thus each different Theoretical Shipping Frequency – the Order to Delivery Lead Time Calculation Model is used to understand how the Order to Delivery Lead Time varies on the basis of the combination between delivery service and shipping days. Clearly, this assessment has the objective to choose the combination of shipping days that minimizes the OtD LT, and it is carried out per class and irrespectively of the macro-region.

- Class A has a Theoretical Shipping Frequency of 5 times per week, as a consequence there is no choice about the shipping days. It results:

<table>
<thead>
<tr>
<th>DLV. SERVICE</th>
<th>MON.</th>
<th>TUE.</th>
<th>WED.</th>
<th>THU.</th>
<th>FRI.</th>
<th>SAT.</th>
<th>SUN.</th>
<th>TSF</th>
<th>OtD</th>
</tr>
</thead>
<tbody>
<tr>
<td>24h</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>2,7</td>
</tr>
<tr>
<td>48h</td>
<td>3</td>
<td>3</td>
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<td>5</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4,0</td>
</tr>
</tbody>
</table>

*Figure 31 – OtD LT model for class A*

- Class B has a Theoretical Shipping Frequency of 4 times per week and three out of five combinations of weekly shipping days for both the 24h and 48h delivery services are comparable in terms of OtD LT:

<table>
<thead>
<tr>
<th>DLV. SERVICE</th>
<th>MON.</th>
<th>TUE.</th>
<th>WED.</th>
<th>THU.</th>
<th>FRI.</th>
<th>SAT.</th>
<th>SUN.</th>
<th>TSF</th>
<th>OtD</th>
</tr>
</thead>
<tbody>
<tr>
<td>24h</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>2,86</td>
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<td></td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
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<td>2</td>
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<td>3,14</td>
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<td>2,86</td>
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<td>2</td>
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<td>2,66</td>
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<td>3,14</td>
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<tr>
<td>48h</td>
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<td>5</td>
<td>5</td>
<td>5</td>
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<td>3</td>
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<td>4,43</td>
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<td>4</td>
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<td>5</td>
<td>4</td>
<td>4</td>
<td></td>
<td>4,43</td>
</tr>
</tbody>
</table>

*Figure 32 – OtD LT model for class B*

In order to simplify as much as possible the management of the shipping calendar in the TO BE scenario the combinations able to minimize the OtD LT for both the 24h and 48h delivery services concurrently are further considered. As a result class B can be shipped either on Mon., Tue., Wed., and Thu., or on Mon., Wed., Thu., and Fri..
• Class C has a Theoretical Shipping Frequency of 3 times per week and if the 24 hours delivery service is used the combination Mon., Tue., and Thu., is the one that minimizes the OtD LT. On the other hand, considering a 48 hours delivery service the KPI is minimized for two combinations of shipping days: Mon., Wed., and Thu., and Mon., Wed., and Fri..

<table>
<thead>
<tr>
<th>DLV. SERVICE</th>
<th>MON.</th>
<th>TUE.</th>
<th>WED.</th>
<th>THU.</th>
<th>FRI.</th>
<th>SAT.</th>
<th>SUN.</th>
<th>TSF</th>
<th>OtD</th>
</tr>
</thead>
<tbody>
<tr>
<td>24h</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3,48</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>2,86</td>
</tr>
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<td>3</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3,71</td>
</tr>
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<td></td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3,00</td>
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<td>3</td>
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<td>2</td>
<td>5</td>
<td>4</td>
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<td>3</td>
<td>3,29</td>
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<td>3</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3,29</td>
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<td>4</td>
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<td>2</td>
<td>3</td>
<td>3,43</td>
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<td>3</td>
<td>3,57</td>
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<td></td>
<td>3</td>
<td>2</td>
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<td>5</td>
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<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3,71</td>
</tr>
</tbody>
</table>

|           | 48h  | 3    | 3    | 7    | 6    | 5    | 4    | 3   | 4,43|
|           | 3    | 6    | 5    | 6    | 5    | 4    | 3   | 4   | 4,57|
|           | 3    | 7    | 6    | 5    | 5    | 4    | 3   | 4   | 4,71|
|           | 4    | 3    | 5    | 6    | 5    | 4    | 3   | 4   | 4,29|
|           | 4    | 3    | 6    | 5    | 6    | 4    | 3   | 4   | 4,29|
|           | 3    | 3    | 7    | 6    | 5    | 4    | 3   | 4   | 4,43|
|           | 3    | 3    | 6    | 5    | 6    | 5    | 4   | 4   | 4,57|
|           | 3    | 6    | 5    | 5    | 6    | 5    | 4   | 4   | 4,86|
|           | 4    | 3    | 5    | 5    | 7    | 6    | 5   | 5   | 5,00|

Figure 33 – OtD LT model for class C

• Class D has a Theoretical Shipping Frequency of 2 times per week:

<table>
<thead>
<tr>
<th>DLV. SERVICE</th>
<th>MON.</th>
<th>TUE.</th>
<th>WED.</th>
<th>THU.</th>
<th>FRI.</th>
<th>SAT.</th>
<th>SUN.</th>
<th>TSF</th>
<th>OtD</th>
</tr>
</thead>
<tbody>
<tr>
<td>24h</td>
<td>2</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>4,14</td>
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<td>2</td>
<td>6</td>
<td>5</td>
<td>4</td>
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<td>2</td>
<td>3,57</td>
<td>3,29</td>
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<td>5</td>
<td>4</td>
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<td>2</td>
<td>3</td>
<td>5,00</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>7</td>
<td>6</td>
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<td>4</td>
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<td>2</td>
<td>2</td>
<td>4,86</td>
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<td>2</td>
<td>2</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5,00</td>
</tr>
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<td>2</td>
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<td>5</td>
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<td>3,57</td>
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<td>2</td>
<td>2</td>
<td>7</td>
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<td>4</td>
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<td>6</td>
<td>5</td>
<td>4</td>
<td>4,43</td>
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<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>4,43</td>
</tr>
</tbody>
</table>

|           | 48h  | 3    | 8    | 7    | 6    | 5    | 4    | 3   | 5,00|
|           | 4    | 3    | 7    | 6    | 5    | 4    | 3   | 5   | 5,14|
|           | 7    | 6    | 5    | 6    | 5    | 4    | 3   | 5   | 5,14|
|           | 8    | 7    | 6    | 5    | 6    | 4    | 3   | 5   | 5,14|
|           | 3    | 3    | 9    | 8    | 7    | 6    | 5   | 5   | 5,14|
|           | 3    | 6    | 5    | 7    | 6    | 5    | 4   | 5   | 5,14|
|           | 3    | 7    | 6    | 5    | 6    | 5    | 4   | 5   | 5,14|
|           | 4    | 3    | 3    | 8    | 7    | 6    | 5   | 5   | 5,14|
|           | 4    | 3    | 6    | 5    | 7    | 6    | 5   | 5   | 5,14|
|           | 7    | 6    | 5    | 5    | 10   | 9    | 8   | 5   | 7,14|

Figure 34 – OtD LT model for class D
The shipping days combinations through which the OtD LT is minimized are Mon. and Thu. if a 24 hours delivery service is used, or Mon. and Wed. if a 48 hours delivery service is utilized.

Table 13 displays a recap of what disclosed above:

<table>
<thead>
<tr>
<th>CLASS</th>
<th>DELIVERY SERVICE</th>
<th>SHIPPING DAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MON.</td>
</tr>
<tr>
<td>A</td>
<td>24h</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>48h</td>
<td>X</td>
</tr>
<tr>
<td>B</td>
<td>24h/48h</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>C</td>
<td>24h</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>48h</td>
<td>X</td>
</tr>
<tr>
<td>D</td>
<td>24h</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>48h</td>
<td>X</td>
</tr>
</tbody>
</table>

*Table 13 – Potential shipping days combinations*

The final selection about the shipping days for each class has to deal also with the need to balance the volumes in the warehouse in order not to clog both the picking and the shipping areas, however in order to perform that assessment is primarily needed to understand which type of service to utilize.

**DELIVERY SERVICE**

The choice about the delivery service takes into account the need to minimize as much as possible the Order to Delivery Lead Time, but it considers also the results in terms of Cost-to-Serve. Actually the costs to be sustained for a 24h delivery service are greatly different from the ones to be applied for a 48 hours delivery and thus the trade-off between cost and service has to be carefully managed. Again, in order not to augment the complexity of the TO BE logistics customer service, the two macro-regions are treaded in parallel: it means that the delivery services associated to Italy, France and Spain’s classes are the same of the ones linked to Germany and UK’s classes. As a consequence, given the dissimilar shipping profile per class, the Cost-to-Serve ratios for the same class of the two macro-regions are different.
After some cross-functional analysis it has been decided to utilize a 24h delivery service for class A, while a service guaranteeing deliveries in 48 hours for class B, C and D. In this way the service to the best performing stores has been improved keeping an affordable overall Cost-to-Serve. Figure 35 shows the new Cost-to-Serve ratio per class and split for macro-region:

![Figure 35 – New CtSr per class and macro-region](image)

Despite the favourable shipping profile of class A for the region composed by Italy, France and Spain, its Cost-to-Serve ratio is pretty close to the one of class B, and the outcome is similar also for Germany and UK: this is due to the express couriers’ rates that are close to double couriers’ ones. Apart from that case the Cost-to-Serve ratio is:

- On an intra-class perspective, whatever the class considered, always lower for Italy, France and Spain in respect to Germany and UK. This is due to the shipping profile of the two macro-regions, which is always larger (e.g. more pieces per shipment) for the first set of countries;
- On an inter-class perspective, increasing as soon as the shipping profile becomes smaller (e.g. less pieces per shipment). This is due to the rate structure of couriers and express couriers which penalize small shipments in favour of larger ones;

On top of these analysis the new overall CtSr, weighted on volumes, is equal to €1.02, while it was equal to €1,19 in the AS IS status. This great drop has been achieved by the re-classification of customer and by the review of the shipping frequencies.

**ORDER TO DELIVERY LEAD TIME**

Since both the shipping calendar and the delivery service have been defined and the Cost-to-Serve ratio has been assessed and approved, the Order to Delivery Lead time has to be evaluated. In
parallel the assessment of the estimated picking and shipping volumes per day has to be performed in order to verify the correct balancing of warehousing and shipping activities. To do so, given the hypothesized delivery services, it is possible to skim the arrangements expressed in Table 13 and to obtain the following ones:

<table>
<thead>
<tr>
<th>CLASS</th>
<th>DELIVERY SERVICE</th>
<th>SHIPPING DAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MON.</td>
</tr>
<tr>
<td>A</td>
<td>24h</td>
<td>X</td>
</tr>
<tr>
<td>B</td>
<td>48h</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>C</td>
<td>48h</td>
<td>X</td>
</tr>
<tr>
<td>D</td>
<td>24h</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 14 – New potential shipping days combinations

In order to find the best alternative among the four achievable by combining the rows of Table 14, the daily workload in terms of overall pieces shipped per day has been assessed. The preeminent alternative is the one characterized by the more balanced daily workload, or in other words, by the lowest standard deviation among the daily workloads, and it is the following one:

<table>
<thead>
<tr>
<th>CLASS</th>
<th>DELIVERY SERVICE</th>
<th>SHIPPING DAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MON.</td>
</tr>
<tr>
<td>A</td>
<td>24h</td>
<td>X</td>
</tr>
<tr>
<td>B</td>
<td>48h</td>
<td>X</td>
</tr>
<tr>
<td>C</td>
<td>48h</td>
<td>X</td>
</tr>
<tr>
<td>D</td>
<td>24h</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 15 – Final shipping days combination

For this alternative the standard deviation is equal to 16,122 pieces, while for all the other three alternatives it would have been equal to 21,591 pieces. This alternative is in fact characterized by to peak days – Monday and Wednesday – in which all the four classes are released into picking and thus shipped, by two “average workload days” – Tuesday and Thursday – and by a really unloaded day, Friday. However the low Friday’s workload is common to all the alternatives under
examination and it does not represent thus something that could be eluded with other allocation schedules.

Graphically that alternative can be depicted as follows, where columns represent the workload in terms of pieces shipped for each working day and are built considering classes’ contribution:

![Workload schedule of the chosen alternative](image)

Once the classes have been created, the Theoretical Shipping Frequency and the Cost-to-Serve ratio assessed and the workload balanced as much as possible, it is finally possible to point out the definitive picture of the Order to Delivery Lead Time of the TO BE logistics customer service, which is expressed on Table 16:

<table>
<thead>
<tr>
<th>CLASS</th>
<th>TSF [shipments/week]</th>
<th>OtD LT [days]</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5</td>
<td>2.71</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>4.14</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>4.29</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>4.57</td>
</tr>
</tbody>
</table>

Table 16 – Final TSF and OtD LT assessment per class

From that figures it emerges that class A customers are served with the shortest possible Order-to-Delivery Lead Time and, theoretically, their shipments are performed 5 times per week. In this way their huge sales are constantly supported by the continuous and fast refilling of their shelves and showcases. Moreover the Order-to-Delivery Lead Times for class B, C and D being pretty close
among each others and always shorter than 5 days allow that customers to receive their orders in a reasonalbe time frame. Given the closeness of the OtD LT for these classes the main driver for the service differentiation consists in the number of shipments per week: thanks to this variable the best performing stores are served always on a regular base and even to stores clustered on class D at least two deliveries per week are guaranteed. These differences in the Theoretical Shipping Frequency had allowed to balance the shipping profile and thus to obtain an acceptable Cost-to-Serve customers.

### 6.2.3 MAIN FINDINGS, FUTURE STEPS AND LIMITATIONS

In conclusion, thought this study most of the insights, lacks and omissions encountered in the analysis of the set-up and performance of the AS IS logistics customer service have been touched.

Firstly classes are now built on the basis of a single quantitative variable: this point disables the possibility for subjective interpretations and it is finally based upon logistics needs. For second, in the TO BE logistics customer service set-up classes have a geographical scope and their boundaries varies across macro-regions in order to guarantee the highest possible adherence of the model to the maturity stage reached by the different markets. Additionally the number of classes has been reviewed and their numerousness has now a clear rationale behind. Fourthly each class now has a dedicated delivery service and a dedicated Theoretical Shipping Frequency, two factors that together are able to fully guarantee the actual achievement of a more than reasonable Order to Delivery Lead Time. Lastly all these steps and consideration have made possible the proper evaluation of the Cost-to-Serve: the Cost-to-Serve now is in line with the services agreed to each class and well represents the set-up of the business.

Additionally all the insights for improvement expressed in paragraph 6.2 have been shared together with and beyond the Teams that participated to the project in order to ensure the largest possible spread of knowledge and awareness about the possible results achievable, and they are considered to be the basis of the future set-up of the business. Practically they have been implemented in September 2016 becoming effective starting from October 2016 together with the go-live of the Q4. The choice was driven by the fact that, even if the scenario was widely studied and accepted by all the Teams involved in the project, it has been almost impossible to clearly predict what would have been its impact over the business. As a consequence it has been decided to wait until the arrival of the low season in order to perform a trial without the risk of affecting the business. If after this first test the outcome would be positive it has been planned to finally and definitely implement the
project over the five reference markets also for the peak season. In the meanwhile it has been agreed to extend the analysis both to other markets within the STARS trade channel and to other Luxottica’s businesses, such as its Wholesale and Retail divisions.

In its entirety the project lasted for a total of 10 months and it has been characterized by three well-differentiated phases:

1. The analysis of the AS IS scenario, which began in November 2015 and ended in April 2016, for an overall duration of 5 months;
2. The provision of the insights for improvement, which lasted 5 months, from April 2016 to September 2016;
3. The TO BE scenario implementation, which went live on October 2016 and is still ongoing;

Even though these three phases can be easily recognized along the project, it has to be considered that the former two have been carried out in parallel for at least one month. The overlap was due to the strict deadline imposed to the project in order to be able to go-live for Q4 2016 and thus to pinpoint improvements before the full end of the analysis phase. This overlap did not cause conflicts or redundancy since in the first moments of the second phase only macro considerations have been pointed out. The project, to pass all along these three phases, required the involvement of many teams, and foremost EMEA Transportation, EMEA Logistics Customer Service and STARS Business Planning, and required a deep cross-functional effort to match and properly balance each team’s objectives. At the end it resulted with an improved awareness of how the business was carried out and how it is going to be run, on what are the leverages to touch in order to improve its performance and on what could be the next steps in order to exploit the results of this research for similar purposes.

The greatest limitations of the study are mainly two, and both of them are concerned with the perimeters of the project. Actually on one hand the study has been carried out with regard to a single trade channel over the other three currently managed by the company (Wholesale, Retail, Ecommerce), and it has considered only a sample of five markets over the 130 countries in which Luxottica operates. On the other hand the present dissertation has been focused on the implications that the right segmentation of customers could have over the transportation step of the Order to Delivery process, but it did not consider in an accurate and comprehensive way all the other steps, such as the allocation phase and the warehouse activities.
7. CONCLUSIONS

In a context in which competition is growing more and more and firms need to be innovative, constantly in evolution and projected toward customers and their needs, an analysis aimed at improving the Logistics Customer Service can help companies in looking at logistics not only as a cost driver, but as a revenue enabler. Additionally the present study, involving the assessment of the industry world leader in the eyewear business, has clearly evidenced that nowadays several gaps between theory and practice still exist. Indeed, on one hand, the theories dissertated in this study have been treated since 1948 and a large body of knowledge has been developed around ‘90s and ‘00s, however, on the other hand, limited application is visible in practice: in the academic environment case studies and practical revisions and deep-dives on these topics are something very rare; similarly, among the business environment, these concepts are seldom applied. This has been confirmed also by the approach characterizing this research, in which the literature review has been analysed alongside the on-filed experience. This kind of exercise is something relatively new in the academic environment and it has led to favourable results being successful in well integrating the two environments and in leveraging on the peculiarities of the former to bridge the gaps of the latter and vice-versa. Actually the on-field experience had allowed practically touching and experimenting different tangible problematics and several diverse themes and topics that have clearly evidenced the huge gap existing between theory and practice. The more significant lesson learnt among several others probably consists in the precious awareness that the pace of the academic environment is not always able to proper sustain the frenetic rhythm of the business: business decisions, especially the most operative, usually have to be taken within a certain time frame which, as long as that might be, is always too short to allow the perfect study from the academic viewpoint of the effects of that choice in a so complex environment. On the other hand it has been evidenced that sometimes the practical world is missing the full picture that, on the contrary, is almost always evidenced in literature. On top of that the study has undoubtedly evinced the great complexity behind Luxottica’s operations: the density of variables, leverages and equilibria to respect and balance is huge and this is something that had, in some specific and delicate phases, slowed down the pace of the study. Even though sometimes it has been necessary to employ more resources rather than what hypothesized, the major milestones have been reached always on time and, moreover, the objectives of the research have been met as well as the expected results have been achieved. Indeed at the end of the study a clear model to evaluate and improve Company’s logistics performance toward
customers has been drafted and the model, validated by Luxottica’s Teams involved in Planning and Logistics, has been practically applied. After the go-live the model has been implemented also for other markets, impacting thus on additional trade channels and additional geographical areas. As a consequence the final objective of the study - to achieve a standard methodology able to lead to a customer service improvement at the as-is costs, or an overall cost-to-serve frontier reduction at the as-is customer service – has been achieved.

Even though the model has been practically applied and in the very short-run it had already evidenced some streams for improvement it is crucial to note that one of the major limitation consists in the short breadth of variables that, being pretty far and beyond the perimeter of the study, have not been faultlessly assessed. Indeed once pointed out that they would not have been disrupted as the model would have been implemented, their valuation has been left out. For second it is essential to consider that the project has been developed in order to perfectly fit Luxottica’s processes, meaning that in order to be applied to other scenarios it has to be slightly adapted and routed on other entities’ processes. However, even though fine-tunings would be necessary, the current structure of the model and the methodologies on which it is based can support a wide range of applications, especially in business to business environment. Ultimately it is crucial to keep into consideration that a six-month internship would not have been enough to achieve a sufficient appraisal of the business and thus to conclude in a coherent and articulated way the present study. Fortunately further time on the project has been spent and this had allowed the achievement of an optimal model completeness and potential.
8. REFERENCES


