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The Management of Product Life Cycle and Innovation in the Italian Home
Appliance Industry: The Case of Haier Europe Group

La Gestione del Ciclo di Vita di Prodotto e dell'Innovazione nell'Industria
italiana dell'elettrodomestico: Il Caso del Gruppo Haier Europe

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ABSTRACT

L'industria italiana dell'elettrodomestico è stata una delle più fiorenti in Europa sin dagli inizi. Tuttavia, nonostante la promettente crescita registrata già nei primi anni ed in particolare a partire dagli anni 50' fino agli 80', con la fine del XX secolo si è assistito progressivamente a tassi di crescita sempre più moderati.

In Europa, dove lo scenario competitivo risultava comunque più frammentato rispetto al resto del mondo, la progressione dell'industria verso la fase di Maturità negli anni 80' e 90' ha determinato tassi di concentrazione nel settore sempre più elevati, conseguiti prevalentemente tramite acquisizioni.

Inoltre, con l'inizio del XXI secolo, che ha visto l'entrata nel WTO di Paesi come la Cina, un aumento del potere di acquisto dei competitors provenienti dall'estremo Oriente e la Crisi Finanziaria Globale del 2007-2008, si è assistito ad un ulteriore processo di concentrazione del mercato.

Parallelamente, per quanto riguarda il ciclo di vita dei prodotti all'interno dell'industria dell'elettrodomestico, è stata registrata negli anni una progressiva compressione della durata di questi ultimi, a causa dei ritmi sempre più serrati ai quali le innovazioni hanno avuto luogo.

Il presente lavoro ha come obiettivo quello di valutare lo stadio evolutivo del ciclo di vita dell'industria europea e italiana dell'elettrodomestico, determinare il ruolo svolto dall'innovazione nel dare forma all'evoluzione del ciclo di vita del prodotto ed al contesto industriale e, in ultima analisi, come il tema dell'innovazione viene affrontato dalle aziende del settore.

INTRODUCTION

The Italian Home Appliance Industry has been one of most flourishing in Europe from the second half of the twentieth century. Nonetheless, despite the promising steady growth experienced in those years, starting from the end of the 20th century the industry grow rates started flattening. In Europe, where the competitive scenario was more fragmented than in the rest of the world, with few major competitors, the situation gave rise to a series of acquisitions, which resulted in a higher industry concentration.

With the beginning of the twenty-first century, which saw the entrance of China and other major players in the WTO and the global economic crises in 2007, difficulties increased for the whole sector and many groups were acquired by Global competitors.

The present work aims at understanding the European and Italian Industry Life Cycle evolutionary stage, the role of innovation in shaping the single product life cycle paths and the industrial context and, ultimately, how it is regarded by companies.

In order to achieve this target, the first chapter will provide a theoretical framework for the analysis, which will also address the further research. Afterwards, starting from the definition of Product Life Cycle theory and after providing the main theoretical tools for its effective management, a theory about innovation will be introduced.

The second chapter, instead, will be more analytical. Hence, after a brief theoretical introduction about the Industry Life Cycle, the chapter will delve, supported by the use of data, with an attempt to assess the Home Appliance Industry evolutionary stage, with a particular attention to the European and Italian markets. In order to conduct the analysis two periods will be examined and compared: the one from 1950 until the end of the 20th century and the one starting from 21st century.

Last, the second chapter will introduce some observations for understanding innovation dynamics and patterns, acknowledging the key role played by innovation and knowledge diffusion in shaping both Product and Industry Life Cycles, including the industrial contexts they are most likely to take place in.

Ultimately, the third and last chapter will delve with the study case of the Group Haier Europe. In particular, the analysis will involve an introduction of the Group's history, starting from the Italian brand Candy, and adding time by time all of brands which have been incorporated, contributing to the today Groups' composition, until the last acquisition by the Chinese global player Haier, along with the decision to set up its Headquarter in Brugherio (Monza), where Candy was initially born.

Moreover, since the acquisition by Haier has taken place only recently, in 2019, the further analysis, encompassing economic, competitive and strategic aspects will still refer to the whole Group, but a higher attention will be provided to the brands Candy and Hoover, and to the segments washing machines and washer dryers.

Furthermore, the field of analysis will be shrank down, taking into consideration only the first Group's "parent" brand: Candy. At this point, the assessment will delve with a study of Candy's Value proposition and Product Portfolio. Within Candy's Product range, the study will focus on the washing machine Aquamatic and on the assessment of its Life Cycle evolutionary stage. Ultimately, the chapter will present one of the latest product innovations undertaken on the latter Aquamatic model: Aquamatic Pet, a new pet-dedicated washing machine, a project followed by me.

1. A THEORETICAL FRAMEWORK ABOUT PRODUCT LIFE CYCLE AND INNOVATION

1.1 THE PRODUCT LIFE CYCLE

1.1.1 Background and Theoretical Framework

Marketers often utilize the concept of product life cycle as an accepted theory, however, only few of them are conscious of its origins and early uses.

First, in the attribution of "life" to a product, marketers explicitly draw on concepts from the biological sciences (Gregory E. Osland, 1991, p.68). Furthermore, although many authors refer to the analogy of an individual's life to describe a product's life, the geometric growth and decline of the traditional PLC bell-shaped curve has its biological roots in studies of populations of species (Gregory E. Osland, 1991, p.68).

Already in 1798, as explained by Gregory E. Osland (1991, p.68), Malthus applied to the human race the principles of population biology, postulating that man's population is necessarily limited in its growth by limited means of subsistence, following a path of development which might be described by a bell-shaped curve. Therefore, he argues that man faces at best a "maturity" stage. Also Darwin, in his studies in 1859, noted that the growth of population is followed by destruction at some period, while Le Bon, in 1898, observed that each element in a civilization experiences a four-stage process, from propagation to decline (Gregory E. Osland, 1991, p.69). The investigated aspects by the latter researcher were in particular cultural aspects such as ideas, arts, literatures, and religions, aspects that were all destined to the same trend. After a first stage, characterized by adoption by a negligible number of apostles who own a certain degree of popularity due to their authority, the idea enters in the second stage where it is rapidly accepted and imitated. In the third stage, the penetration, takes place when the idea spreads to all

classes. Ultimately, in the last stage, the idea starts its decline when it is abandoned by the governing classes. It was, however, only with Tarde, in 1903, that the previous biological concepts were applied to industrial products. As a matter of fact, he understood that innovations can propagate in the industry by intentional imitation at a more or less rapid pace. However, Tarde departed from Le Bon by postulating that cultural aspects, goods included, are actually not subjected to inevitable and irreversible decline (Gregory E. Osland, 1991, p.69, Tarde 1903, p.383). Furthermore, according to this practitioner the adoption of innovations is mostly driven by imitation of the superior by the inferior (Gregory E. Osland, 1991, p.69, Tarde 1903, p.383). Superiority comprehends characteristics such as wealth, bravery, political class, scientific genius and physical strength and varies with the times and the culture (Gregory E. Osland, 1991, p.69, Tarde 1903, p.383).

In 1914, other economists continued studying the development of firms by lending theories from biological studies. Among them, Chapman and Ashton studied the sizes of businesses in the textile British industries from 1884 to 1911, coming up with the following conclusion (Gregory E. Osland, 1991, p.70, Chapman and Ashton, 1914, p.512): “the growth of a business and the volume and form which it ultimately assumes are apparently determined in somewhat the same fashion as the development of an organism in the animal or vegetable world. As there is a normal size and form for a man, so but less markedly, are there normal sizes and forms for businesses.”

Few years later, in 1920, Marshall noted that with aging, a firm's vigor tends to decline (Gregory E. Osland, 1991, p.70). More importantly, Clark in 1934, in a debate about business cycles, mentioned how products display "growth curves." Automobiles are identified, for instance, as a product which takes several years before reaching the

maturity. Furthermore, Boulding (Boulding, 1950, p. 34) stated that there is an "inexorable and irreversible movement towards the equilibrium of death. Individuals, families, firms, nations, and civilizations all follow the same grim law, and the history of any organism is strikingly reminiscent of the rise and fall of populations on the road to extinction."

However, at the beginning of the 20th century, also another discipline, anthropology, gave its contribution to underpinnings of the product life cycle concept. As explained by Osland, in 1919, the anthropologist Kroeber wrote a seminal work, stating that social phenomena typically follow a common path accounting for five stages: origin, growth, climax, decline, then death or petrification, giving raise to very similar curves. These stages apply to aesthetics, politics, religion, and manufactured objects (Gregory E. Osland, 1991, p.70, Kroeber, 1919). In his studies, Kroeber, in order to support or reject his thesis, decided to quantitatively analyze over a given period of 75 years the transformation experienced by articles of women' formal dresses.

The primary conclusion by Kroeber is that the ascendancy exercised by each single individual on fashion is ultimately reduced by the regularity in change. However, on this outcome not all the practitioners agreed. Yet two different approaches have been utilized: biologists, some economists, and a few anthropologists offered deterministic explanations, viewing the cycle as an independent variable while other economists, most psychologists and sociologists viewed the cycles as dependent on factors such as emulation and imitation (Gregory E. Osland, 1991, p. 73).

In the same years, in 1916, Hurd, reported that the local company Western Union faced stable sales and declining profits until unthought uses for telegraph were found out, for different uses such as sending holiday greeting and business advertisements, rather than

just "bad news and critical messages" (Gregory E. Osland, 1991, p. 74). By doing so, the company's sales greatly increased in the 1910.

Later on, in 1923 Dickinson, affirmed the need for manufacturers, to drop products that are overtaken by technical innovations and changed buying habits (Gregory E. Osland, 1991, pag.74). Solutions to changing realities in the marketplace are, according to Dickinson, the utilization of diversification strategies and promoting new uses for declining products (Parnica, Bogdan-Mircea, 2019, p.34). According to Dickinson (Dickinson, 1923, p.70) readers should "keep their minds fixed on the final consumer and what he or she is thinking."

Similarly, for McCullough (McCullough, 1929, p.96) the most important factor for determining a product's decline is the "eye and mind of consumers", while Giles in 1927 went beyond, trying to postulate five types of actions that can be taken to prevent products from declining: find new uses, advertise, sell abroad or to different segments in the U.S.A., and ultimately improve the product (Gregory E. Osland, 1991, pag.74).

Few years later, in 1932, Potter stated for the first time the need to keep consumers buying products in a repeated manner, in order to maintain high sales and profits and avoid a product decline over time. These studies reveal that the concept of Product Life Cycle, even though still informal and approximative was already part of the 20th century business people' thinking.

Nonetheless, it is with Kleppner, in 1933, that for the first time the discussion moved to the phases that products go through over time. In particular, he identified three stages of PLC upon which appropriate advertising strategies can be based: pioneering, competitive, and retentive.

[...] In the pioneering stage marketers introduce a product with advertising that reveals a need and shows how the product meets that need. At the competitive stage advertisers show the distinctive merits of their brand over the others. Products in the retentive stage are at the height of their success, with advertisers merely keeping the name of the brand before current buyers [...] (Gregory E. Osland, 1991, p.74).

Furthermore, Kleppner suggested that managers whose products are in the retain stage should try to strive for a new cycle for those goods, by attracting new targets of customers who are not familiar with those goods. In addition, a product can contemporaneously go through several stages, which are uncorrelated with the levels of sales and profits, but they rather depend on the viewpoint of different groups of people.

Since then, and by the end of the 1950s, the basis of literature about the Marketing Product Life Cycle were developed. The growth of the emerging literature had as neuralgic center the USA, where the economy was experiencing a period of unparalleled success which was unmatched by Europe, still dealing with the consequences of the Second World War. With a background of economic prosperity, factors such as the several mid-century technological innovations and a strong market demand along with increasingly demanding customers, fostered a great increase in the amount of new product introductions, determined the success or the failure of some other products, as well as the definition of new strategies for products commercialization and advertising. Furthermore, because of the proliferation of competition, dealing with issues such as the price-fixing of products at different levels of their lifecycle and products obsolescence and decline became fundamental.

In this context, the product life cycle theories aimed at producing a coherent framework, which could provide an answer to the previous relevant challenges, especially in

consideration of the new product failures or obsolescence, without being companies capable to take appropriate steps towards goods' retirement.

The first notions, together with the first usage of the term "Product Life Cycle", were introduced in his writings by Dean, who studied the price policies for each phase of a product's market development. In his descriptive model named "the cycle of competitive degeneration" (Dean, 1950 p.53), Dean emphasized the perishable distinctiveness of products as competition increases (Gregory E. Osland, 1991, p.75). In particular, he believed that "new products have a protected distinctiveness which is doomed to progressive degeneration from competitive inroads"; and this progress was defined by him the "cycle of competitive degeneration": "The invention of a new marketable specialty is usually followed by a period of patent protection when markets are still hesitant and unexplored and when product design is fluid. Then comes a period of rapid expansion of sales as market acceptance is gained. Next the product becomes a target for competitive encroachment. New competitors enter the field, and innovations narrow the gap of distinctiveness between the product and its substitutes..." (Dean, 1950).

Although Dean only explored the pricing policies in the pioneering phase and in the mature phase of a product's life cycle, his explanation of the cycle was explicit enough to be seen as the origin of the emerging product life cycle theory (Hui Cao & Paul Folan, p.10).

Another interesting discussion of the concept was drawn in the same years by other practitioners such as Alderson and Associates (1951), reprinted in 1962 by Lazer and Kelley. According to Alderson the growth of a business goes through three periods: establishment, expansion, and stabilization. However, according to this theory there is no decline stage.

Furthermore, it is at the end of the '50s and more precisely in 1959, that the first graphic illustration of the classic PLC concept was found in an article by Forrester.

[...] The familiar S-curves of sales and profits are diagrammed as a function of time in four stages: introduction, growth, maturity, and decline. Sales peak at the saturation stage, whereas profits are at their highest at the end of the growth stage [...] (Gregory E. Osland, 1991, p.75, Parnica, Bogdan-Mircea, 2019, p.34). Furthermore, starting from Kleppner's work, different objectives and advertising techniques were suggested for each phase of the cycle.

Few years later, in 1964, the first formalization of Product Life Cycle was presented in a book by Stanton. The book reported a discussion by Booz, Allen, and Hamilton published in 1960, in which managers are encouraged "to focus on the profit curve and to develop a continuing stream of innovations in order to survive as a company" (Gregory E. Osland, 1991, p.75).

Among the cited authors, Levitt, in 1965, provided a very important contribution in the popularization of the concept of PLC in a managerially oriented article, providing a description of the way products interact with their markets.

About PLC, he particularly emphasized its use as a forecasting tool, able to provide managerial implications concerning profit and sales levels, when the product moves through the PLC stages (Gregory E. Osland, 1991, p.75).

By the end of the 1960s, with the above mentioned first important promulgators and influential papers by Forrester [1958], Patton [1959], Levitt [1965], Cox [1967], and Polli and Cook [1969], the product life cycle body of theory emerged as an established entity in its own right (Hui Cao & Paul Folan, p.11).

Nonetheless, throughout the years the research in the field has been indagating different aspects of the Product Life Cycle, with the period ranging from the 1950s to the mid-1970s, having practitioners focusing more on the elaboration of theory, and on combating its critics, and a latter phase of empiricism in the late-1970s, which is continuing up to today (Hui Cao & Paul Folan, p.11).

This first paragraph will deal mostly with Levitt's conception of Product Life Cycle as exposed in his Harvard Business Review paper "Exploit the product life cycle" in 1965 which explains how each product has a certain life cycle that begins with its market development and ends with its decline stages (Levitt, 1965).

According to the model, there are four stages in a product's life cycle: Market Development, Growth, Maturity and Decline.

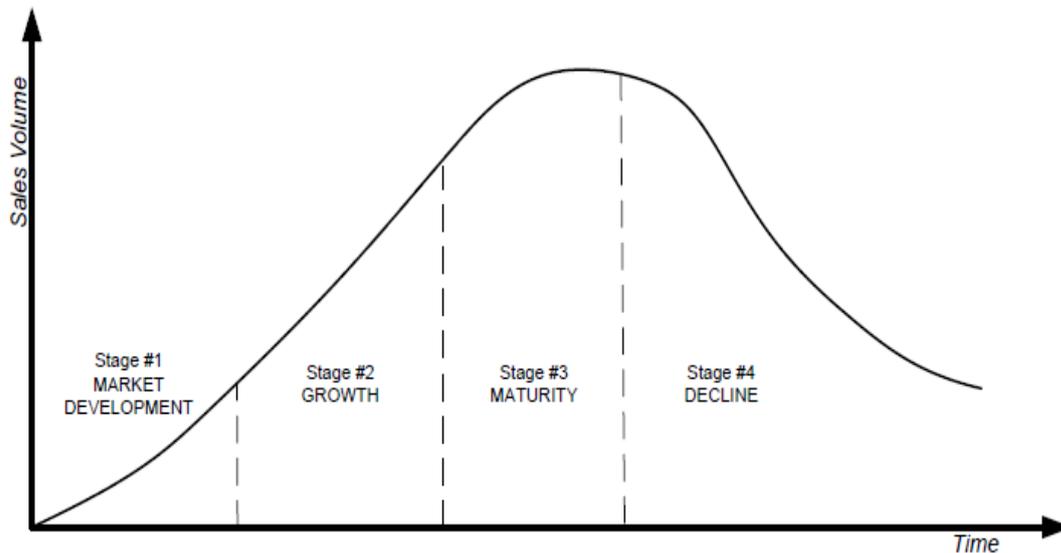
Looking at its graphic representation a bit more in detail, it is possible to see how the curve is a simple illustration that plots sales against time, providing an overall representation of how a product is likely to perform through the four product life cycle evolutionary stages – rising through the Introduction and Growth stages, before peaking in the Maturity stage, and eventually falling off during the Decline stage (productlifecyclestages.com).

In particular, the resulting curve is a simple parabola which can be described by the equation $Y = a + bX + cX^2$ (Cox, 1967) and it might be divided into four segments, not necessarily equidistant in terms of time, respectively named 1) market development, 2) growth, 3) maturity, and 4) decline; phases agreed upon by all early commentators (Hui Cao & Paul Folan, p.12).

Before moving to the different strategies which can be applied to a product when it moves from one phase to another, this paragraph will deal with a bit more in depth explanation

of the four stages of the Product Life Cycle and with the respective challenges which should be addressed by marketers.

Figure 1.1.1.1 Industry Product Life Cycle Representation, after Levitt (1965)



Source: Hui Cao & Paul Folan, p.10

- the Market Development stage takes place as a result of successful product development which ends up with its introduction into the market. At this point, since the product has just been introduced, profits are still low and the competitive arena is populated by only few competitors. As gradually sales grow, the product will enter in the next stage.

Few challenges should be correctly addressed during the introduction stage.

First, the *market is small* or inexistent. When a new product is launched, the product 's relative demand is typically low or lacking. This means that initially sales are going to be exiguous and despite consistent investments in advertising, it might take a while before most products achieve the expected volumes.

Second, *high costs*. Prior to a product introduction, research and development activities must be undergone, and once the product is created, many manufacturers will need to

heavily invest in marketing and promotion in order to achieve the targeted market demand (productlifecylestages.com). Costs for these activities might be very high.

Third, *losses or lack of profits*. One of the consequences of sustaining high initial costs for getting the product to the market and low sales, is that most companies could experience negative profits during this phase. Nonetheless, the sector could influence the entity and the duration of the above mentioned losses (productlifecylestages.com).

However, few benefits should be acknowledged within the introduction stage.

First, *competition is limited*. If the product is new and no other business has engaged in its production and marketing, the company would enjoy the first mover advantage. The lack of competitors could help the company to capture a large market share before new entrants start launching rival products, and sometimes can enable a business's brand name to be associated with the whole range of products (productlifecylestages.com).

Secondly, the *high selling price*. The launch of a new product on the market often allows manufacturers to charge a premium price above the one that would become the average market price. This might be due in part to a lack of substitute products and in part to the willingness of early adopters to pay a higher price to get in their hands the latest innovations, allowing the company to recover some of the costs of developing and launching the product (productlifecylestages.com). Nevertheless, in some situations, the price policy might be completely opposite with manufacturers offering at the beginning low prices, to enhance demand.

- The Growth stage is the second of the Product Life Cycle phases and it is considered a key moment for marketers. It is when, during the PLC, the demand for the product and sales increase the most. Furthermore, as a result of higher production volumes, production costs reduce, while higher profits are earned by manufacturers. At this point, the product

becomes broadly recognized and new rivals will start entering the market with their own versions of the product. The product will enter the next stage when many potential new consumers will have bought it. Also at this stage, few important challenges should be correctly addressed.

First, the *increasing competition*. When the demand for products will start to increase new manufacturers attracted by the developing market will start entering in business, increasing the competition.

Second, *lower prices*. If in the introduction stage, firms could apply a premium price to early adopters for the new products, when competition increases manufacturers may need to decrease the selling price in order to reach the wished rise in sales.

Third, a *different and more sophisticated marketing approach is required* since product novelty alone will not anymore be enough to attract new customers.

Nonetheless, it is possible to summarize several benefits that characterize the Growth stage as well.

First, *production costs are reduced*. Differently from the new product development and from the Introduction phase, the Growth stage can be the most profitable part of the whole PLC for a manufacturer. The reason is that as manufacturers increase the production to meet demand, costs can be reduced exploiting economies of scale along with the already organized and efficient routes to market.

Furthermore, companies can enjoy a *greater consumer awareness*. If investments in the previous phase have been correctly done, consumers should have, at this point, a higher product awareness. Consequently, the demand for the product will start to rise and in the same way the market size will be greater, leading to a relatively steep growth in sales that is typical of the Growth stage.

Third, the *increase in Profits*. Thanks to inferior costs and to considerable increases in sales, profits are likely to rise during the Growth stage, both for what concerns the total amount, and on the profit margin realized on each single sold product.

- The Maturity stage is the third stage after the Introduction and the Growth phases. The product becomes widely known and it is hopefully sold in large quantities. The intensity of competition is high and the product's price tends to go down. Furthermore, expecting customers to gradually start replacing their current product with a new one, the company will start looking for possible adaptations and product innovations in order to prevent the decline stage. The latter costs are therefore quite high at this stage. Also in this phase, few important challenges should be correctly addressed.

The first challenge which should be faced by the company is *market saturation*. Despite the steady growth in sales experienced during the Growth phase, in the maturity stage the market starts its saturation process, since at this point only few new consumers can be reached.

A second issue which need to be addressed is the *decreasing market share*. Indeed, a feature of the Maturity stage is the huge number of competitors contending a higher market share. Therefore, keeping a certain market share becomes increasingly challenging for companies.

Third, *profits start to decrease*. Despite at this stage the whole market is likely to make the most of profits, many manufacturers actually experience a decrease in their profits during this stage. As matter of fact, since sales are likely to reach their maximum during this stage and profits have to be divided among all of the competitors in the market, any loss of market share and fall in sales, can involve a subsequent decrease in profit margins. Furthermore, this fall in profits could be worsened by the descending prices when

manufacturers try to attract consumers on the basis of price (<https://www.commercepk.com/product-life-cycle-stages-examples/>).

Also during the maturity stage manufacturers can enjoy some benefits.

First, *costs* continue to *reduce*. Benefiting from the economies of scale, which in the Growth stage allowed to decrease costs, in the maturity stage more efficient alternatives to produce high volumes of particular products can be fostered by ulterior developments in production, allowing to reduce costs even more.

Second, *differentiation* could help to increase market share. Although saturation might be reached during the Maturity stage, there could be still chance for manufacturers to increase their profits and market share adopting other strategies. For instance, the use of innovative marketing campaigns and the offering of more diverse product features, through differentiation can help companies to increase their market share (<https://www.commercepk.com/product-life-cycle-stages-examples/>).

- The Decline stage represents for a product the beginning of the end. The market becomes saturated and the product unpopular. While this phase often can occur naturally, it can also be accelerated by the introduction of new products or technologies. Nonetheless, despite the declining sales, companies might decide to continue offering the product in order to retain their loyal customers. In the Decline stage, particularly, few challenges should be addressed.

First, the *demand* for a product will start to *decline* during the last stage of the product life cycle. Indeed, since newer and better products will be available on the market, consumers will usually cease buying the product in favor of the substitutes.

Second, a *decrease in sales and profits*. Owing to the declining market and to a fall in sales also the overall profit available to the manufacturers will start to decrease. In this

phase, manufacturers could try to recover part of their market share, but it could be very difficult.

Third, the *product withdrawal*. Ultimately, when the product is not any more profitable and there could be no chance to readdress this decline, the only choice for manufacturers might be to withdraw their product before becoming unprofitable.

Furthermore, it is possible to summarize several benefits characterizing the Decline stage as it follows.

First, *production is cheaper*. Even during the decline stage, if manufacturers are able to reduce their costs, there might be the possibility to continue selling their products at a profit. The targets of costs reduction and of extending the profitable life of a product may be achieved in several ways, for instance by choosing different manufacturing options, utilizing alternative production techniques, or changing the location where the production takes place.

Secondly, manufacturers could *extend the profitable life of a product* during the decline stage, by looking for new and less expensive markets for sales. Although the profit potential from these markets may not have justified the investment needed to enter them, manufacturers may choose the latter option when the only other alternative might be to withdraw a product altogether (productlifecyclestages.com).

1.1.2 Comparing the Originator's Product Life Cycle curve against Imitators' ones

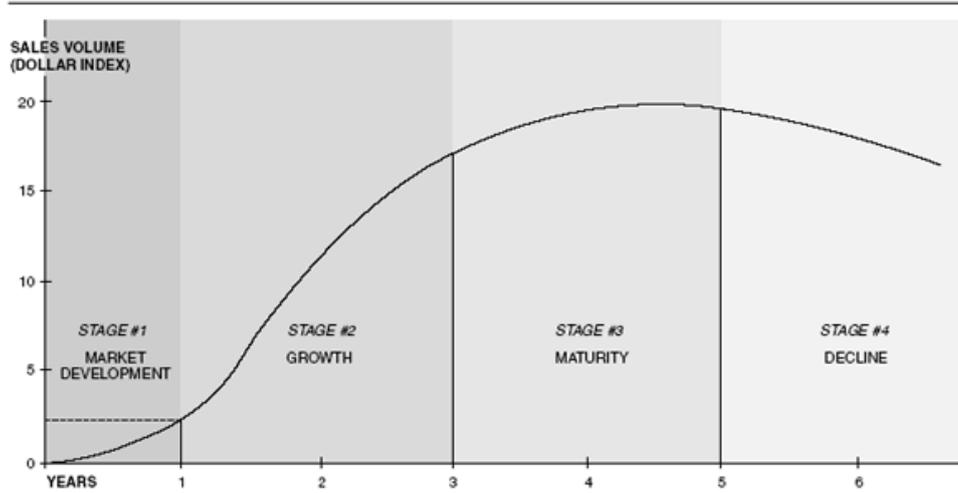
It is important for companies to understand the stage of the Product Cycle they are into and to try to foresee the next one, in order to take the appropriate measures for managing the PLC. However, trying to see in advance what a product's growth pattern might be is not very useful if one fails to distinguish between the industry pattern and the pattern of the

single firm—for its particular brand (Levitt, 1965). As a matter of fact, according to Levitt, the Product Life Cycle of the original producer will be almost certainly different from the one of the industry as a whole, as it will be probably different for the individual companies in the industry.

This paragraph will focus on the Product Life Cycle of the original producer, which is the company that bears the most of costs, troubles, and risks for developing both the market and the product.

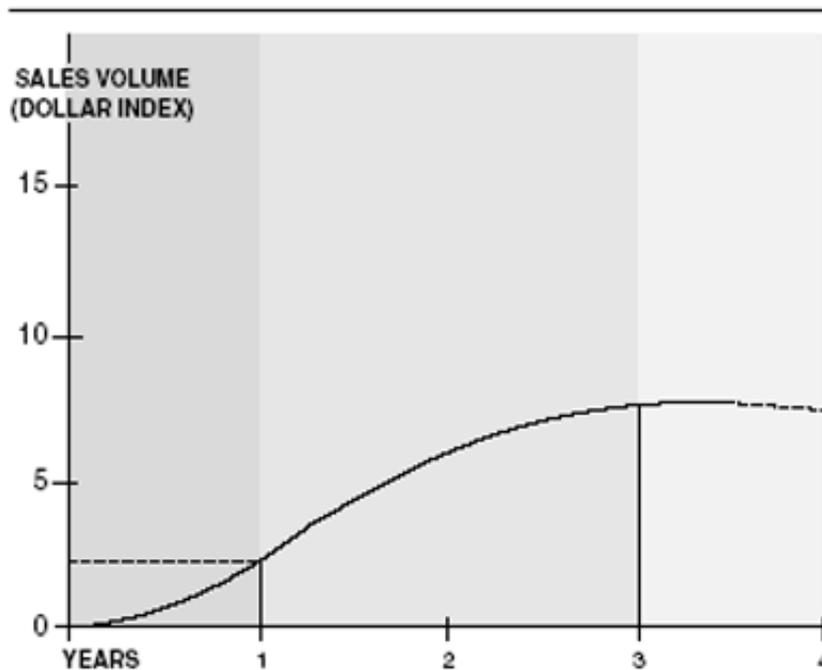
The first type of pressure the originator must face with is the competitive pressure. Indeed, right during the market development stage, if the innovator demonstrates that a solid demand for the product exists, numerous rivals will enter the market to capitalize and exploit at best the market growth. Consequently, while imitators will almost immediately experience a rapid growth of sales, due to the high product's total demand, for the incumbent company the growth becomes truncated, since it has to share the boom with new entrants (Levitt, 1965). Thus, according to Levitt (1965), the potential rate of acceleration of the originator's own takeoff is shrank down and, indeed, may actually fail to last as long as the industry's once. The reason why this happens is that often imitators, by entering the market only in a later moment, have the possibility to come up with an improved version of the product or with lower prices. The latter improvements, while allowing to keep the market expanding, have a deteriorating effect on the originator duration and rate of growth. All these dynamics can be better understood comparing the product Life Cycle curves in the Exhibit I and Exhibit II.

Figure 1.1.1.2 Product Life Cycle - Entire Industry - Exhibit I
(Levitt, 1965)



Even though the curve represents the whole industry, during the Market Development Stage in Exhibit I there is only one company, that is the originator. However, by phase 2, the incumbent company – or innovator- shares the industry with many competitors. Hence, while Exhibit I is an industry curve, its Stage I represents only a single company’s sales curve (Levitt, 1965).

Figure 1.1.1.3 Product Life Cycle – Originator’s curve- Exhibit II
(Levitt, 1965)

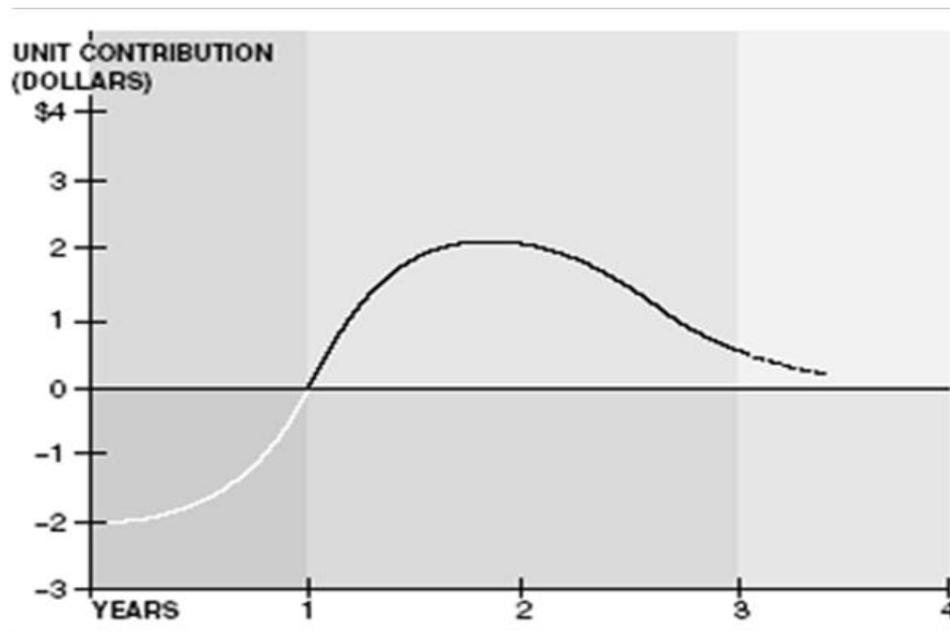


The Exhibit II shows instead the sales curve of the originator's brand and not that of the industry. It can be seen that while in years 1 and 2 sales are expanding at the same phase of the whole industry, after year 2 while industry sales in Exhibit I are still vigorously rising, the innovator curve in Exhibit II has begun to decrease its rate of growth (Levitt, 1965). The innovator is now sharing the boom with a higher number of competitors, some of whom are much better positioned now than he is (Levitt, 1965).

A second challenge that the originator company has to face is the profit squeeze on its profit margins. As shown by Exhibit III (Levitt, 1965), which displays the profits per unit of the originator's sales, since during the market Development Stage sales volume are too low for the existing price, the profits per unit are negative. Afterwards, during the Growth stage, due to an increase of sales volume and to a reduction of production costs, unit profits boom. Consequently, total profits increase enormously attracting competitors.

Figure 1.1.1.4 Unit Profit Contribution Life Cycle – Originating company- Exhibit III

(Levitt, 1965)



Now, while at year 3, as shown in Exhibit I, industry sales will still be rising nicely, the Exhibit II shows how the incumbent company's sales may have at the same time already started decreasing remarkably. This means that, whilst at this point the originator's total profits may still be increasing because of the large volumes of sales, the profits per unit will often have taken a drastic downward course (Levitt, 1965). The negative trend of unitary profits however, must have started way before, around year 2, when they first topped and thereafter started decreasing, as shown in Exhibit III.

Therefore, by the time the innovator's sales began to flatten in year 3 - as shown in Exhibit II - unit profits may actually be approaching zero in Exhibit III (Levitt, 1965).

At this point, since more competitors have entered the industry, the rate of industry demand growth has slowed down. Contextually, competitors will have started cutting their prices, owing partially to the decrease of production costs - due to better and more productive equipment - and partially to their willingness to get business.

Furthermore, according to Levitt's model, the Maturity Stage will generally last until there will not be [...] competitive substitutes, [...]no drastic shifts in influential value systems, [...]no major changes in dominant fashions, [...] no changes in the demand for primary products which use the product in question, and no changes either in the rate of obsolescence of the product or in the character or introductory rate of product modifications (Levitt, 1965).

Ultimately, Maturity can last for a long time, or it could actually never be reached. For instance, some products, such as those belonging to the fashion industry, sometimes hesitate momentarily at an uneasy peak, and then quickly drop off into total obscurity (Levitt, 1965).

1.1.3 Product Development and Withdrawal: two additional evolutionary stages within the Product Life Cycle model

The product life cycle model is a classic marketing tool which attempts to explain the four different stages that most products pass through during their lifetime. However, while the traditional stages of Market Development, Growth, Maturity and Decline deal with a product life once the product is already launched on the market, two other equally important stages should also be considered: the Product Development, that is the stage of getting a product to market and the Withdrawal, which takes place when the product is no longer profitable.

The Development Stage is the part of a product life which takes place before the product is introduced on the market. The product development is a process that may require a lot of time and money and therefore it is one of the stages on which manufacturers heavily invest. As a matter of fact, while developing a product involves creating a product to sell, any effort by manufacturers would be useless without a deep understanding of the market the product will be sold into. Therefore, a successful product development cannot prescind from creating a product in line with the market requirements or expectations.

Furthermore, since products have a bounded lifetime and new ones have to be created in order to substitute them and to constantly keep the offer in line with the market requirements, also for new products development it is possible to identify a number of specific phases.

Figure 1.1.3.1 New product development ideation phases

(<https://productlifecyclestages.com/new-product-development-stages/>)



First, every new product cannot prescind from an initial *idea*. The latter can be either quite simple, when a product is derived from a similar one that already exists, or fairly complex when the new product is revolutionary and unique. Consequently, also the amount of resources devoted to the idea development varies according to the complexity.

Second, once a company comes up with a restricted and selected number of ideas then it has to undergo a *market research* in order to understand whether there is demand for a certain product and what characteristics it should have in order to best fit the requirements of the potential market (<https://productlifecyclestages.com/new-product-development-stages/>).

Third, the *development* phase of a product encompasses the creation of various designs and prototypes, that can be modified even through several manufacturing stages in order to end up with a new final product, which consumers are willing to purchase.

Fourth, in the *testing phase* the new products are often tested by manufacturers thanks to restricted groups of possible customers. This allows companies to be sure they have a usable product before it is launched on the market and before investing money on production and promotion.

Fifth, after looking at customers feedbacks in the testing phase, the *analysis* allows to manufacturers to make all the necessary changes to the product. Furthermore, thanks to the information provided by real customers manufacturers will be able to make several strategic decisions that will be crucial to the product's success, for instance the price the

product will be sold at or how it will be marketed (<https://productlifecyclestages.com/new-product-development-stages/>). Ultimately, when a product has passed through all the new product development process, the only thing left to do is to *introduce it into the market* (<https://productlifecyclestages.com/new-product-development-stages/>).

However, making right all the stages of a new product development, does not ensure the creation of a profitable product. Instead, profitability can be reached when not only the new product development has been correctly managed, but also when appropriate actions are taken in order to properly manage the whole Product Life Cycle.

The Withdrawal Stage virtually follows the Maturity and the Decline stages of a Product Life Cycle evolutionary path. It is during this phase that cost management becomes even more important. As a matter of fact, once manufacturers decide for a product withdrawal, all sales stop. Therefore, it is necessary to have a plan in place to minimize costs while withdrawing from the market, which might even consist of developing a new product that can take advantage of the established platforms and infrastructures.

In conclusion, recognizing all the activities that must be undertaken and all of the resources needed in order to develop a product and to proceed to its withdrawal once the product is not any longer profitable, some believe that an effective Product Life Cycle Management can take place only when also the two stages of Product Development and Withdrawal are considered.

1.1.4 A critical perspective about the Product Life Cycle

Although the Marketing Product Life Cycle model is a useful tool that can provide businesses and their marketing departments with an understanding of how products will perform, many critics have been advanced to the model over the years.

Challenges have included queries into the inevitability of the sequences of the phases, criticisms of the vagueness of borderlines between phases, and doubts about the difference between product class, product form and brand (Hui Cao & Paul Folan, p.17). This paragraph will delve with some of them.

First, although the concept of Marketing PLC has been discussed for over fifty years, the definition of ‘product’ is still hazy. Levitt (1965) argues that the sales curve of the originator’s brand does not form the same shape as the curve of the industry (Hui Cao & Paul Folan, p.18). For him the ‘product’ in the M-PLC does not indicate only a product brand, but the products of the whole industry. However, his meaning for the term ‘industry’ is unclear. The difference between *product classes*, *product forms*, and *brands* was first defined by Polli and Cook (1969): items which belong in different product classes have near-zero demand cross-elasticity; all objects within a product form can be mean fully added in physical units; and brands within a product form are unique, apart from package differences (Hui Cao & Paul Folan, p.19).

Another criticism on the M-PLC model is about the definition and the identification of the four phases. Indeed, although the qualitative description of the phases has been recognized since 1950s; little has been said with few quantitative analyses on how to assess the boundaries between each stage (Hui Cao & Paul Folan, p.19).

Another concern regards the application of the model to the real world, which might not be that easy due to markets and consumers unpredictability. For instance, while a product

may have a limited life span, it is very difficult for companies to understand precisely how long it will last, even when they are very good at making decisions based on the available information, because consumers' demand can be unpredictable (<https://productlifecyclestages.com/product-life-cycle-challenges/>). In addition, also other factors influencing the product lifespan are continuously changing. A change in production costs or the launch of an alternative product, could affect the duration of one of the different product life cycle stages.

Ultimately, one other criticism which is often addressed to the model is the emphasis that many manufacturers put on the suggestions the model makes, so that it eventually becomes self-fulfilling. For example, if a company - basing its decisions on the product life cycle curve - experiences a decrease in sales, the trend may lead the manufacturer to believe the product is entering the Decline stage and the consequent decision could be the one to spend less on promotion, while the opposite strategy would be more helpful, allowing it to capture more market share and increase sales again (<https://productlifecyclestages.com/product-life-cycle-challenges/>).

Finally, recognizing the kind of challenges that will be faced during a product life time and despite the above mentioned limits, the Product Life Cycle model is still a useful tool and if properly applied, can provide businesses and their marketing departments with the opportunity to plan ahead and be better prepared to meet those challenges.

1.2 MANAGING PRODUCT LIFE CYCLE AND PRODUCT INNOVATION

1.2.1 Strategies and tactics for Product Life Cycle Management

Because the total life span of a product, the length of each stage of the PLC and how fast a product goes through the entire cycle depend, among other variables, on the actions taken to manage the product life cycle, this section will delve with a series of tactics and strategies to develop products and ensure the right level of focus, effort and investments throughout each stage of M-PLC.

In order to discuss the strategies used for the Product Life Cycle Management first a notion of PLM should be provided. Product life cycle management is the application of different strategies to help meet the challenges coming from the market, so that whatever stage of the cycle a product may be going through, the manufacturers can maximize sales and profits for their product (productlifecyclestages.com).

An effective management of the product life cycle should start even before entering the Market Development stage (Levitt, 1965, p.29). Successful new product strategy should indeed try to forecast and to look ahead over some years the likelihood, characters, and timing of competitive and market events. Furthermore, while prediction is always hazardous and seldom very accurate, it is undoubtedly far better than not trying to predict at all (Levitt, 1965). In this way the company can avoid eventual pitfalls and reduce the probability of getting stuck into situations that might even reveal unbearable for the business.

In particular an early judgment concerning the possible length of the product's life, including the possibilities of expanding its uses and users (Levitt, 1965), can help determine in advance the best price policy to be adopted in the Market Development stage or the kind of relation the enterprise should build with its retailers. Long-term planning

and the consideration of the competitive requirements necessary for the next stages of a Product Life Cycle can have powerful virtues, helping marketing managers even to define the direction and pace of the on-going technical research in support of the product (Levitt, 1965).

Therefore, the real advantage of pre-planning for market stretching and of making product life extension predictions is to have a preventive approach rather than a reactive one. The result will be a product strategy that includes some sort of plan for a timed sequence of conditional moves (Levitt, 1965).

Now it is possible to introduce the tactics and strategies which should be used by marketers, in each specific phase of the Product Life Cycle in order to prolong its lifetime.

First, since in the Market Development Stage the product is still unknown, its first version should be as basic as possible. Furthermore, managers should aim at establishing a clear brand identity and at building product awareness among early adopters and innovators, in order to increase sales. Hence, large investments in communication are needed. For what concerns the choice of the distribution channels, instead, it should be quite selective. Price for the product or service instead should be set as high as possible to sell, in consistency with the provided level of quality.

Pricing strategies in the Market Development phase may include: a) *skimming*, which can be differentiated into *rapid* skimming, when launching the product on the market with a high price and with a consistent level of promotion, or *low* skimming, when promotional level is low and price is set high. An alternative strategy could be to set price to start off at a low level, through a penetration pricing strategy, which might be rapid, when a high promotion is carried out, or slow, when also promotion is low.

In this phase, businesses could even try to foster demand, by being more selective and limiting the product to a specific type of consumer.

Ultimately, emphasis should also be given to developing a more cost-effective production.

In the Growth Stage of the Product Life Cycle, instead, the marketers' aim is to increase profits by establishing the product position in the market and by stressing differentiation.

Therefore, the company's offer should include, besides the single product, other additional services, possible warranties and even foresee eventual product extensions.

As a matter of fact, since the Growth stage is when sales should increase rapidly along with profits and market share, actions will aim at maximizing these opportunities.

Marketing messages should shift from product awareness to product preference and new market segments will try to be reached. That is: instead of seeking ways of getting consumers to *try the product*, the originator now faces the more compelling problem of getting them to *prefer his brand* (Levitt, 1965). In addition, businesses could decide to follow to improve product quality or to add new product features or support services to increase the market share. Furthermore, in order to cope with a growth in the market demand, it generally becomes increasingly easy to open new distribution channels and retail outlets (Levitt, 1965). Prices should be kept as high as it is reasonable to be able to penetrate the market and sales promotions should be reduced in order to take advantage of the heavy consumer demand (slow penetration strategy). Ultimately, according to Levitt's PLC model, as the growing demand creates an exaggerated impression of profit opportunity, more competitors will enter the market. "Some of these will begin to charge lower prices because of later advances in technology, production shortcuts and the need to take lower margins in order to get distribution. All this in time inescapably moves the industry to the threshold of a new stage of competition" (Levitt, 1965).

When the sales reach their peak, the product will enter the Maturity stage. This however means that the market will reach saturation, and therefore a change of marketing tactics could be required to prolong the product life cycle. The main goal for marketers is at this stage to maintain the brand loyalty and to defend the company's market share from competition. In order to do so, finer and finer differentiations in the product, in customer services (Levitt,1965), and in the promotional practices and claims must be made. Common strategies utilized during this phase can be divided into two categories: *market modification*, which includes entering new market segments, redefining target markets, converting non-users; and *product modification or product innovation*, for instance, modifying or improving the product's features, quality, pricing and differentiating it from other products in the market.

Furthermore, since managers should also look ahead of the curve in order to anticipate possible future evolutions in the Product Life Cycle, during this phase some companies will also start looking for possible adaptations and product innovations in order to prevent the decline stage. Ultimately, expecting customers to gradually start replacing their current product with a new one, companies will try to boost sales by developing a reminder-oriented promotion (Levitt, 1965). Moreover, when entering the maturity stage typically markets require competing more effectively. According to Levitt, at this stage the manufacturer is increasingly forced to attract consumers on the basis of price, marginal product differences, or both. Last, manufacturers will provide services and deals proposed in connection with the product or create and promote fine product distinctions through packaging and advertising (Levitt, 1965).

Furthermore, for what concerns distribution, typically the producer will carry on holding his distribution outlets, retaining his shelf space, and, in the end, trying to secure even more intensive distribution (Levitt, 1964).

With the Decline Stage, sales and profits will start declining. The reasons to a sales decline may reside in changes in consumer preferences, in technological advances or even in alternative products available on the market. In addition, only few competitors are able to survive. Indeed, while overcapacity was already apparent during the Maturity Stage, it is in the Decline that it becomes endemic. At this stage, competitors will try with aggressively depressive tactics to frighten their rivals and induce them to withdrawal their product or propose mergers or buy-outs.

In order to reduce costs, a useful measure could be for companies to eliminate from their portfolio the weakest products. In addition, it is possible to reduce the promotional expenditure on the offering or to implement price cuts in order to encourage customers to buy the manufacturers' products. Furthermore, it is necessary to reduce the number of retailers selling them.

Other useful tactics to reduce losses in this phase could be to find an alternative use for the same product, to keep the product and wait for competitors to withdraw from the market first and to harvest the product or service before discontinuing it (Levitt, 1964).

Ultimately, another option for the business could be to discontinue the product from the offering by significantly reducing its price, to eliminate all the inventory.

Nonetheless, it is commonly acknowledged by companies the necessity to modify their product during the Growth or Maturity phases, in order to prevent the Decline stage.

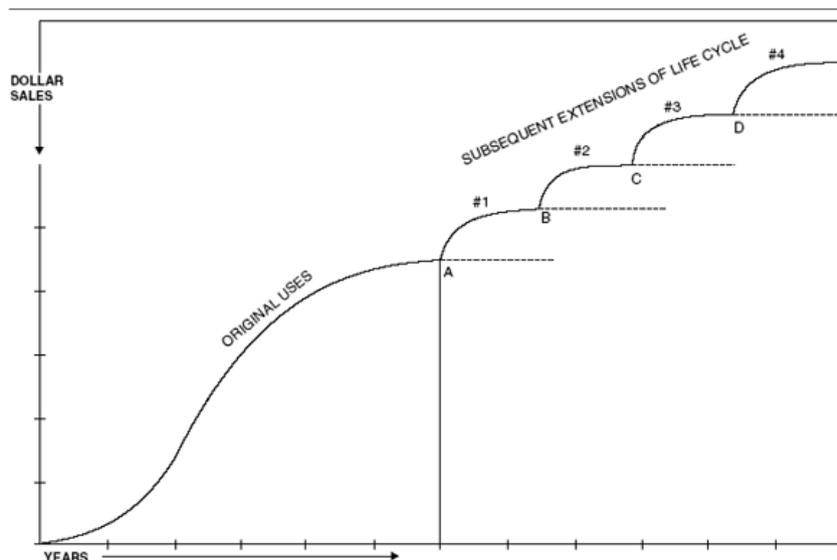
1.2.2 Policies for a Product Life Cycle Extension

In the previous sections it has been discussed how every time a company develops a new product or service, the innovator should attempt to plan ahead the required actions to be taken at the different stages of the Product Life Cycle in order to keep sales and profits sustained, rather than following their downward sloping trend (Levitt, 1965).

The present paragraph will delve with what is called Product Life Extension or market stretching, which involves planning actions ahead of the actual product launch, in order to increase the length of a product lifespan.

The following Exhibit shows the case of a Product “X” Life Cycle. What is interesting to mention here is the way how the sales life has been repeatedly and systematically extended and stretched over time, once the sales curve was flattening (Levitt, 1965). As a matter of fact, after entering the Market Development stage, the product had experienced a steep sales growth, with high profits. Nonetheless, after few years the sales curve had started flattening, until managers reacted by taking appropriate measures for revitalizing sales and profits.

Figure 1.2.2.1 Hypothetical Product Life Cycle – Exhibit IV (Levitt, 1965)



In particular, the point A in the graph shows the hypothetical point at which the sales curve flattened out. If no measure had been taken, the sales curve would have continued straight along the flattened path indicated by the dotted line at Point A (Levitt, 1965).

The latter point A, is however also the hypothetical point at which the first effort was made to extend the product's life (Levitt, 1965). Therefore, at point A the action number 1 was taken in order to revitalize and to push upward the sales curve. Similarly, also at points B, C and D other actions were taken – respectively named #2, #3, #4 – in order to foster sales and profits. More precisely, the above-mentioned actions tried to expand sales through four different routes (Levitt, 1965):

1. Promoting more frequent usage of the product among current users.
2. Developing more varied usage of the product among current users.
3. Creating new users for the product by expanding the market.
4. Finding new uses for the basic material.

Frequent Usage: One of the ways to propping up the flattering sales curve is to incentivize the frequency of usage. An increased frequency of usage can be obtained by enhancing the need of a particular product or service. The latter would be sales-building action, despite being difficult and exceedingly costly to be undertaken. However, it clearly achieved the goal of promoting a more frequent usage, to increase sales and ultimately prolong the product's life.

Varied Usage: the idea was to enhance a more diversified use of the same product in order to increase sales growth and avoid the flattening of the curve. Also in this case, the goal was achieved as curve moved upwards from point B to C.

New Users: also looking for new users, targeting different groups of consumers for the same product might be a fruitful strategy. The attempt could be carried out by using advertising, public relations, merchandising and influencers.

New Uses: according to the type of product or service, this tactic can have many triumphs. In particular, product innovation, can help finding new and alternative ways to use a certain material or product, relaunching sales upwards and avoiding the flattening of the curve.

1.3 PRODUCT AND PROCESS INNOVATION

1.3.1 Technology as a source of competitive advantage

When analyzing the concept of innovation, it is not possible to prescind from the one of technology, which indisputably represents one of the companies' sources of competitive advantage. As a matter of fact, companies are nowadays operating into an extremely complex competitive environment where technology represents, among the others, one of the main factors affecting companies' strategies and performances.

In addition, the changeable "technological scenarios" affect the way how companies operate, regardless of their operative dimensions, through the creation of innovative products and processes, new machineries and materials and through the growing integration between different technologies, which allow for important technical-organizational synergies to emerge, providing companies with new economic opportunities (Silvestrelli, 2003, p.31).

However, the application of technical-scientific knowledge to companies' operational processes and the intersectoral diffusion of technological changes, unavoidably involve, along with the above-mentioned opportunities, a series of threats. It is up to companies the capability to effectively address opportunities and minimize threats arising from the market.

With this goal in mind, acknowledging the impact of knowledge and technology on the competitive environment and on how the concurrence acts, embracing innovation and integrating it into the companies' strategic choices, becomes fundamental.

A first consideration which should be done when dealing with technological innovation is that it should always be implemented consistently with the company strategic choices.

Secondly, it must be considered that "technology has an effect on companies' competitive advantage, provided that it has a significant role in determining the relative cost positioning and differentiation" (Porter, 1985, p. 195). For instance, the relevance of technology at competitive purposes clearly emerges when trying to reduce the time to market, in the perspective of a "time-based competition" (Silvestrelli, 2003, p.32).

Afterwards, a further consideration must be done. Indeed, as claimed by Porter (1985) Frohman (1985) and Silvestrelli (2003, p. 40) companies do not have to necessarily pursue the technological leadership, in order to obtain the benefits of the technological progress.

Sometimes holding the technological leadership may lead to a competitive disadvantage, because being first in using a certain technology might involve greater disadvantages than actual advantages. First, being technological leaders might be especially disadvantageous when technologies are easy to replicate, especially if their utilization by other companies is not legally protected by patents or industrial designs and secondly when technologies are particularly complex, requiring a noticeable amount of resources' deployment and activities to be undergone for their successful implementation. This means that the higher the excludability is and the simpler the technology is, the more advantageous being a pioneer becomes.

Contrarily, if these conditions do not hold, followers can easily implement technologies after they have been perfected by the technological leaders - reducing their R&D efforts - and being able in the meanwhile to devote their unutilized – or underutilized – capacity and resources for a series of supporting activities (e.g. marketing), determining a more successful implementation of the same technology. Consequently, not always being a pioneer pays off in terms of results, whilst sometimes it can also turn out to be a disadvantage.

1.3.2 Types of innovation

In order to have a better understanding of the concept of innovation few fundamental notions and differentiations must be introduced into the discussion.

First, concerning the type of object, two typologies of innovation can be identified:

- a- Product innovation: in this case innovation refers to the product, so that either a totally *new product* can be introduced into the market or either an existing one might be *improved*, through the change of some of its characteristics or technical features. The distinction between a totally new product and an enhanced one it is not always easy (Silvestrelli, 2003, p.31).
- b- Process innovation: this type of innovation refers either to the invention of a totally *new process* or to the *improvement* of an existing one undergone for obtaining a certain product. Usually, a process innovation is undertaken in order to increase the qualitative threshold of the existing products or either to decrease their production costs (Silvestrelli, 2003, p.31).

However, it is important to mention that the distinction between product innovation and process innovation or between product improvement and process improvement is not always easy, but it is rather fleeting.

Furthermore, the extent of novelty of a certain process or product is not univocal, since it depends on the subjective perception of the involved actors (Valdani, Castaldo, Troilo and Verona in Stampacchia e Nicolais, 2001, p. 68).

Consequently, a process or a technology which is considered new to a certain manufacturer, might be “not that new” for the market, for instance when a company undertakes the production of a product or a similar one, that is already known and produced by rivals.

According to a “market-oriented approach” products might be considered new according to customers’ perception. In this case it is possible to distinguish between two extreme typologies:

- a- *“Radically new products*: which customers cannot classify in any of the “known” product categories and for which they have never had any experience of use previously (Silvestrelli, 2003, p.33).
- b- *Repositioned products*: for which customers perceive some distinctive features compared to the ones already existing on the market” (Silvestrelli, 2003, p.33).

Afterwards, another distinction must be done. As per the “technology incorporated in the product” criteria, two main macro-classes of innovation can be identified:

- a- *Radical innovations*: they modify in a radical way the existing products and production processes. They usually arise from new discoveries and inventions, which give birth to new market segments and sectors.

b- Incremental innovations: whose introduction modifies only partially the existing products and production processes.

Lately, based on the technical advancements recorded in the last years in the field of Information and Communication Technology, the category of disruptive innovations has been introduced. The latter identifies all those technologies spreading in a pervasive manner, rapidly making obsolete all the existing ones. These innovations if on one hand provide an important opportunity for economic development, by fostering the birth of new markets and businesses, on the other hand represent a threat for the survival of those companies operating in the existing markets.

Furthermore, since the distinction between radical and incremental innovations is barely representative for the multiple and diversified cases of innovation, other two classifications of innovation have been introduced based on two dimensions:

A) “the entity of the changes that innovation brings to the technological components of the product (Silvestrelli, 2003, p.34).

B) the entity of the changes that innovation involves for the connections among component parts of the product” (Silvestrelli, 2003, p.34).

In the first case, that is when variations are concerned with only technical components of the existing product, then it is possible to speak about *modular innovations*; conversely when innovation concerns the connections amongst component parts of an existing product the innovation is defined as *architectural* innovation.

Figure 1.3.2.1 Typology of innovation according to technological structure
(Silvestrelli, 2003 p.34, Henderson and Clark, 1990)

		Key components of a product	
		Improved	Transformed
Components interconnections	Unvaried	INCREMENTAL INNOVATION	MODULAR INNOVATION
	Modified	ARCHITECTURAL INNOVATION	RADICAL INNOVATION

1.3.3 New products design and modular architecture

In order to compete on the market, the company has to effectively manage the creation of new products. The creation of new products, however, is the final outcome of a process which involves several activities ultimately grouped according to Silvestrelli,2003 into the following phases:

1. The analysis of the ideas: the innovation process starts with generating ideas, from which the new product will take shape. Sources of ideas may be either:

- a- internal to the company, arising for instance from the marketing and R&D departments or from the sales force;
- b- external, in this case the idea is generated by actors who are external to the company, for example industrial customers and the concurrence. The latter is often studied through “the practice” of reverse engineering, which consists of disassembling rivals’ products and analyzing their characteristics, in order to identify their strengths and weaknesses.

Moreover, as the number of ideas available for the company is often rather high, they must be analyzed in order to select the best. Two criteria should afterwards drive the selection:

- a- the consistency of the idea with the company's strategic objectives, which the corporation intends to achieve through product innovation;
- b- the coherence between the already allocated resources, the ones required for the idea development and the resources which the company can invest on, in order to acquire the necessary capabilities.

2. Preliminary design: the new product concept is generated during this phase. It consists of an approximate description of the technology, the functioning principles and the shape the new product will have; it is generally defined from scratch or through a rough tridimensional model and it is often accompanied by a short written description. Furthermore, at this point of the process it is not generated a single concept of the product but several concepts, with several different features, which are then submitted to possible buyers, with the goal to identify the one which better meets their preferences.

3. Product design: in this phase it is defined the architecture of the product, technologies and components are chosen and "detail specifics" are defined.

Architecture is the technical framework which presents (Ulrich and Eppinger,2001, p. 190):

- a) All the physical components of the product;
- b) The operations that each component is assumed to execute in order to meet the expectations for which it has been designed.

Furthermore, product architecture can have two extreme and opposite configurations:

- a) To the *Modular architecture* belong the following properties:

- each physical component is hold responsible for a certain determined function;
- the connection between different modules is ensured by standardized interfaces, which are designed in a way to connect two or more modules independently from their structure - decoupled interfaces (Silvestrelli,2003, p.36).

b) *Integral architecture*, which displays the following features:

- “the relation between physical components and operations is complex; cases can be three: 1) when the same component is used for more operations, 2) more components can carry out only one operation 3) a combination of the previous two.
- the interfaces between the parts are *coupled*, which means they are designed to connect only specific components” (Silvestrelli,2003, p.36).

Furthermore, the production of modular products has led companies operating within the same supply chain to manage relationships in a different manner. The final producer identified as the “assembler”, composes the offer by aggregating different modules according to the demand. Conversely, modular suppliers are specialized in the production of single modules. Furthermore, the architecture of modular products – also referred to as final products – is defined by the manufacturer autonomously or in cooperation with component producers.

During the design phase the product’s specifications, which are the technical characteristics and the fundamental features the product must have, are defined. In this way it is possible to identify what the product must be able to do in order to satisfy customers’ needs.

The outcome of this phase is the creation of a physical prototype, which is a product approximation, an experimental version, and it can reflect either all the products features

or only some of them. In the first case, the prototype is a general prototype, in the latter case the prototype is defined as a specific prototype.

On the prototype are furtherly made trials and tests aimed at verifying the product functionalities, its conformity to the technical parameters previously defined and the product conformity to the market requests. In the latter case, potential final customers are also involved in the testing activities, being asked to express their opinion about possible product configurations.

4. Industrialization: This phase represents the conjunction between the product design and the production. Based on the product design, it defines the characteristics the production process must have in order to produce the product. This phase is particularly delicate as the bulk of costs is sustained at this point in order to adequate the production process and to make it consistent with the features the final product is supposed to have. Furthermore, if the products features affect the way how the production process is organized, the production process as well represents an important factor in defining the way the product is conceived, both in terms of burdens and possibilities. This is the reason why an early involvement of the process engineers in the product design phase, since the very beginning, represents an important way to guarantee a better integration of the product and process design.

5. The last phase consists of the industrial pre-series realization and it precedes the full regime production of the new product. This stage is very important for quality control purposes as it allows to detect and eventually correct ahead of time possible products' defects before their launch on the market.

6. The Value Analysis to redesign the product: the principle of interchangeability of the component parts, becomes particularly convenient in the process of redesigning the

product, also known as Value Analysis. This method has the purpose to transform and to relaunch an existing product through significant modifications consisting of: a) changing the shape or simplifying the structure of the object, b) diminishing the number of component parts c) modifying the single component part with the aim of reducing the number of operations and shortening the lasting of the production process d) substituting the materials with cheaper ones, keeping consistent the product's functionalities e) diminishing the entity of the resources required to create the final product.

The reality of industrial enterprises shows that among those companies utilizing the marketing strategy of diversification, by offering a number of different products all belonging to the same family of products, tend to apply the principle of interchangeability of the components. The latter strategy allows for a noticeable production cost reduction since companies have the possibility through the "Value Analysis" to simultaneously reduce the number of component parts for each product and to increase the number of standard components, which are interchangeable between the different finished goods. This strategy, which allows to shift the costs of diversification from the production of the components to the assembly phase, has been identified as a new "philosophy of production".

1.3.4 Economic and technical aspects of product platforms

Technological progress and competition push companies to manage more innovation projects at the same time, which all together compose the company's projects on hand. Furthermore, each single project requires a series of efforts made by different actors which must be coordinated in order to reach a certain final result. However, in order to maximize the results not only the efforts must be displayed consistently within the single

project, but the projects as well have to be managed consistently among themselves, also in consideration of the company's overall strategy.

The management of a pocket of projects is therefore strategically important for the company, since it implies simultaneously the management of a series of processes, according to the so-called multi-process approach.

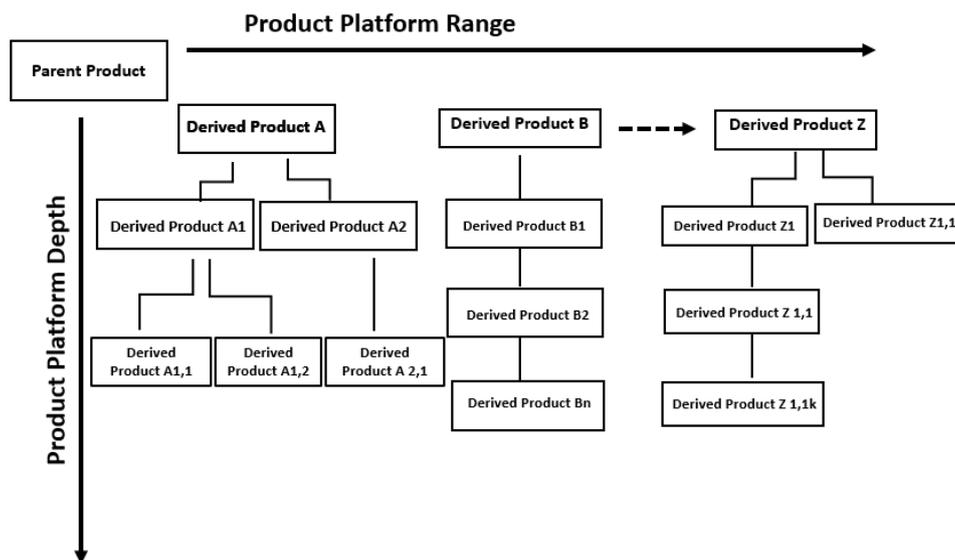
Among the multi-process approaches there is the one for product platforms which has become through the years broadly used among the companies, since it allows to reduce the development time of new products and to meet the needs of flexibility and efficiency, both in the production and in the design activities.

A "product platform can be identified as an ensemble of elements which are common to a group of products, belonging to the same family" (*Silvestrelli, 2003, p.44*). For "product family" it is instead meant a group of products targeting a specific market segment and having a common technological base. Therefore, designing a product platform means defining the guidelines for the development from one Base product of several Derivate products. In addition, the concept of platform is "multidimensional", since products belonging to the same platform may have in common several elements ranging from components, production lines, machineries and production processes to marketing, knowledge and technological know-how. However, companies often prefer to focus on the aspects relating to the technical structure of the products and to the industrial production processes and therefore the term technological platform is utilized in a narrower sense to identify the core design, the common components and the machineries involved in the production process. The differentiation between the derived products is hence provided by changing time by time all the remaining elements and features which are often the most visible ones to the final customers.

The platform development, consisting of deploying the derivate products has got two dimensions:

- a) Range dimension: it refers to the number of products derived from the parent one, which are going then to compose different product lines. In managing this dimension, managers aim at reaching a high degree of differentiation between different lines.
- b) Depth dimension; it refers to the number of derivate products belonging to the same product line. When managing this dimension, companies try to achieve the highest possible number of common components between the products belonging to the same line.

Figure 1.3.4.1 The Product Platform ad its dimensions ù
(Lanzara and Giuliani, 2002, p. 129)



Furthermore, when analyzing the consequences of the use of a product platform, it is necessary to distinguish between two different situations: the first, creating products deriving from a parent one, the second, which consists of creating a product platform – the parent product.

In the first case, when deriving products from a parent one, companies can enjoy the advantages of simultaneously reducing the time to market and the development and production costs. The amount of invested resources is indeed inferior, being the initial costs for research, innovation, production processes and common components already been sustained. Furthermore, by cumulating the quantities of common components belonging to different products – but still deriving from the same parent one- companies can operate with higher production volumes and higher capacity plants, exploiting the deriving economies of scale.

In the second case, when designing a new product platform, the effort in terms of deployed resources is much higher, both considering the time and human and economic resources involved. As a matter fact, planning a new product platform also means deciding what the companies' future products will be, defining the R&D programs, the levels of investment, taking into consideration the possible product evolutions, in order to design a platform which will be compatible with the initial previsions and flexible enough to face future challenges. Furthermore, while the definition of common components for the products' platform may provide a consistent advantage, on the other hand it represents a binding decision as it represents a burden for the possible future products developments. For this reason, it is extremely important in this phase to involve all the representatives of the design, marketing and production teams as well as the top management.

A critical aspect which must be brought into the discussion when designing a new product platform is afterwards the definition of “common” and “differentiating” components. In this case a delicate equilibrium should be kept because if the number of common components is too high, the differentiation between products could be hardly perceived

by customers; vice-versa if the number of common components is too low, companies risk to undermine the economic benefits deriving from the platform approach and from standardization.

A general principle which should be followed to sort out this point, is applying the standardization to those components which are not visible to the final customers, or which do not contribute at increasing the finished products' perceived value.

Furthermore, as companies often deal with more than one product platform at time it is particularly useful for them whenever possible to: a) reduce the number of product platforms contemporaneously managed, b) prolong the product life cycle of the existing platforms, c) increase the number of products deriving from the existing platforms.

Ultimately, the platform approach is not the only one conceiving the utilization of common components for dealing differentiation and resource deployments issues. Indeed, two other methodologies, among the others, attempt to do the same:

- 1) In the “*carry over*” methodology, components previously utilized for different products are reutilized in new projects. In this case, however, it is important to remark that relations between different products and the definition of common components are not previously decided - ex-ante -.
- 2) In the “*shelf innovation*” approach instead the new components are previously designed and developed and are utilized only in a later moment for the creation of new products. Therefore, in the *shelf innovation* and in the *product platform* methodologies companies utilize a pro-active approach in managing projects, previously defining the common elements, differently from what happens with the “*shelf innovation*” one.

2. INNOVATION AND PRODUCT LIFE CYCLES IN THE EUROPEAN HOME APPLIANCE INDUSTRY

2.1 FROM PRODUCT LIFE CYCLE TO INDUSTRY LIFE CYCLE

Strictly related to the Product Life Cycle and innovation themes, is the one of Industry Life Cycle.

According to the theory, as for products, also industries that produce them, go through different phases of their life, from birth to decline, passing through their growth and maturity stages. Similarly to what it has been seen in the previous chapter for Product Life cycle stages it is possible to identify (Peruzzi, 2019, p. 8) :

An Introduction stage: characterized by low sales and low market entry rate owed to the products newness and low customers' awareness. In addition, new technologies implementation, small scale of production, and a lack of experience determine high costs of production and low quality (Grant M. R., 2016).

The Growth Stage, following the introduction stage, is characterized by accelerating market entry as technical improvements and increased efficiency open up the mass market (Peruzzi, 2019, p. 8).

The Maturity Stage, is entered when market saturation increases, which means when market is no longer able to provide new demand and companies face a fierce competition. In this scenario, staying customer demand mostly unvaried, companies can only enhance their growth through product improvements and or by acquiring market share from competitors.

Ultimately, the Decline stage of the Industry life Cycle is reached when the industry becomes challenged by new industries producing technologically superior substitute products (Peruzzi, 2019, p. 8).

The Industry Life Cycle is the supply-side equivalent of Product Life cycle (M. Grant, 2016 p. 271). And yet, since the industry is supposed to produce more generations and different products, it is extremely likely to last more than single Product Life Cycles (Peruzzi, 2019, p. 8).

In particular, two forces are shaping an industry evolution path through its four stages, and they are: a) demand growth and b) production and diffusion of knowledge (Grant M. R., 2016).

For what concerns the former force, it is necessary to stress the idea that the whole Industry Life Cycle and the stages within it, are mostly defined by changes in an industry's demand growth rate over time. According to a neoclassical approach (Agarwell and Gort, 1996, p. 489) even firms entry and exit rates in an industry are dependent on a variety of market attributes, encompassing among them growth in demand, barriers to entry, economies of scale. This means demand growth is an important factor affecting the industry degree of attractiveness.

Considering the initial stage of a new industry development, demand is typically low, products designs are usually primitive, machineries are unspecialized and overall a high degree of uncertainty characterizes the business experience at this stage (Klepper,1997, pp. 146, 147). Hence only few firms will risk entering the new market.

At the development stage, a steep growth in demand, better refined production techniques, the possibility to exploit economies of scale and lesser uncertainty (Klepper,1997,p.147), increase industry attractiveness and consequently also the number of firms willing to enter the market.

At the outset of the maturity stage of an Industry Life Cycle management, manufacturing, and marketing techniques all reach a relatively advanced degree of refinement

(Klepper,1997,p.147). Furthermore since demand at this point might continue to grow but not at a regular rate, all of the activities with customers and suppliers will be aimed at buffering changes in market share. At this point usually, market saturation and a lack of demand growth, tend to discourage new entrants.

As already previously mentioned, the other force shaping industries is the creation and diffusion of knowledge. New knowledge in the form of product innovation is responsible for an industry's birth, and the dual processes of knowledge creation and knowledge diffusion exert a major influence on industry evolution (Peruzzi,2019,p. 13).

First, during the introduction stage there is no leading product design, different technologies compete for their affirmation and technological advancement take place at a rapid pace. The outcome of this technological competition is usually the convergence around a dominant design, which defines how products will look, their functionalities and the best production methods, commonly accepted by the whole industry.

Furthermore, the industry convergence around a dominant design marks a fundamental moment in the Industry Life Cycle since it represents the moment when product innovation shifts from radical to incremental.

This transition represents a milestone for the industry, necessary to inaugurate the industry's growth phase: a greater standardization reduces risks to customers and encourages firms to invest in production capacity (Peruzzi, 2019, p. 14).

At this point, in order to increase production capacity, improve product quality and reliability and reduce production costs, a higher degree of attention will be devolved towards process improvement. Ultimately, an enhancement under all of the mentioned facets reduces uncertainty, which in turn increases industry attractiveness, causing rapidly increasing market entry. In this way the industry reaches the Maturity stage.

2.1.1 Gauging an Industry Life Cycle evolutionary stage

This chapter, after briefly introducing the Home Appliance Industry and its features in its early years, will delve with its evolution, analyzing the sectorial data and dividing them into two periods, from the 50s to the 90s and from the 21st century on.

Ultimately, the chapter will shortly introduce into the discussion an analysis of Product Life Cycles in the Home Appliance Industry.

In particular, in order to conduct the assessment about the industry life cycle evolution, all the data will be collected and analysis carried out bearing in mind few key fundamental indicators:

- Demand and sales, as already mentioned above, demand is one of the most important forces shaping the Industry Life Cycle. Its variations can cause an industry birth, growth, its entry in the maturity stage and ultimately its decline. Demand can be easily inferred by analyzing sales data.

- Price and Quantities → Also prices and produced quantity dynamics are important indicators of an Industry evolutionary stage. As mentioned above, produced quantities tend to be low and prices high at the Introduction stage. Thereafter, during the Growth stage, the growing demand will push firms to expand their production capacity, being able to exploit economies of scale and ultimately to reduce production costs and prices. Furthermore, with the outset of the maturity stage, because of the high competition, prices tend to decrease further while produced quantities tend to remain stable.

- Quality → Maybe the most difficult to estimate objectively, products quality, might be considered another good indicator to gauge an industry's evolutionary stage. The birth of a new industry is typically characterized by low quality and usually primitive products, produced with unspecialized machineries. With the Growth phase, the convergence

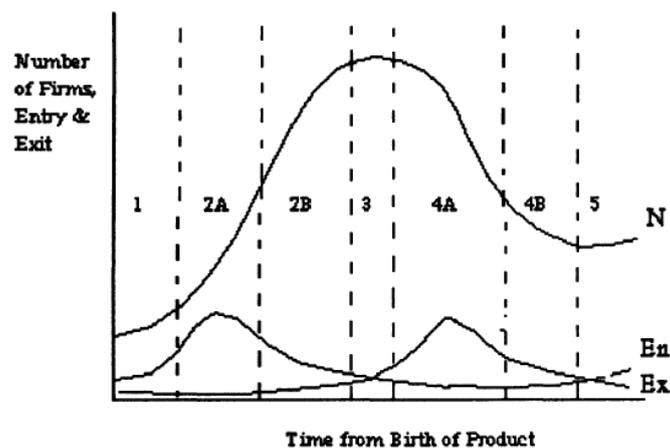
towards a dominant design and better refined production techniques, which production takes place with, allow for an important quality improvement. Ultimately, during the Maturity stage of an industry, techniques and machines perfecting, allows to obtain high quality products.

- Number of firms: The evolutionary stage of the product cycle plays a determining role in the entry, exit and survival rates of firms (Agarwell and Gort, 1996, p. 497). Therefore, it is possible to use the variation in the number of firms in a given industry, as one of the most important indicators of an Industry Life Cycle evolutionary stage.

As already mentioned above, at the inception only few innovator firms will give birth to the industry. In the Growth stage, new entrants will be attracted by the growing sales and profit margins, whereas no firm will be willing to exit the market, and therefore the number of firms (N) within the industry will increase.

From the outset of the Maturity stage on, market saturation and an intensification of competition will cause some firms to exit the market and some other to be acquired by competitors willing to increase their market share. The result will be a declining number of firms (N) and therefore a higher industry concentration.

Figure 2.1.1.1: Number of firms over the Industry Life Cycle
(Agarwal and Gort, 1996, p. 490)



Note: N = number of firms, En = gross entry, Ex = gross exit.

2.2 THE HOME APPLIANCE INDUSTRY

Since the inception in the years '50s and throughout the years, Italian companies succeed to play a major role in the household appliance industry, being able to furtherly consolidate their leadership position.

In particular, the sector growth within the Italian market in the years 50s and 60s has been the result of very well addressed entrepreneurial choices and opportunities.

Whereas the further market development and expansion beyond the national borders and at European level, which took place during the years 60s and 70s, was the result of a superior production capacity and efficiency, which led Italian entrepreneurs to perpetuate aggressive market entry policies. Furthermore, the wave of acquisitions which started since the years 70s, led the market to a higher and higher concentration, with greater companies acquiring smaller ones and an overall market reorganization, which gave raise to the birth of the first Groups, furtherly characterized by production activities and resources scattered throughout the European continent.

Within all of this process, many Italian companies were able to emerge and to affirm themselves in the international landscape, such as the cases of Merloni appliances, Elfi, Candy, Antonio Merloni, IAR-Sital; whilst others despite having been acquired by foreign Groups, were able to maintain a determinant role in the Italian home appliance industry development, with production and many other important supportive activities being kept within the national borders.

Furthermore, the sector development has been characterized by a dense concentration of the sector-related activities in specific regions and areas of the country, mainly due to two phenomena.

First, a more casual factor, due to the initial entrepreneurs' localization choices, whose companies eventually assumed dominant positions within the market and, a second factor, due to the companies' organizational choices which had progressively decided to delegate part of their production phases to specialized enterprises, giving birth to the formation of "system areas", which later on became known as "industrial districts".

Furthermore, despite at the end of the 60s the home appliance market (especially for the so-called "whites") might have already been considered mature, changes in the offer structure continued also throughout the years '80s and '90s, with a progressive offer concentration, achieved through acquisition processes carried out by the main European players.

Ultimately, besides the strategic choices undertaken by the relevant European competitors, some trends have furtherly influenced the sector evolution, implying important changes from the demand side.

First, a higher attention by consumers and policy makers towards environmental issues and themes, which have pushed companies towards important product innovations, oriented to a general reduction of the environmental impact and to a more conscious resources consumption.

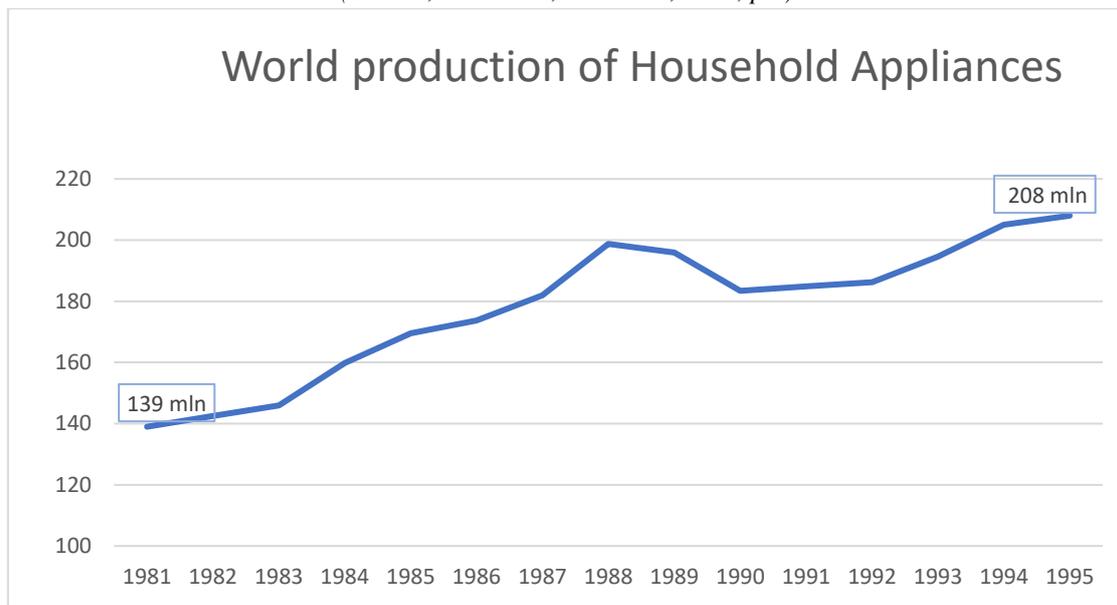
Second, the European countries monetary integration process which has speeded up the concentration process between distribution structures. The growth of the big distribution with a corresponding loss of power by manufacturers, which experienced their value quote along the product value chain, being considerably reduced, that in turn pushed them to invest more on product innovation, on brand communication and on broadening the range of products' supporting services.

Third, the broad diffusion of IOT and of new technologies, which have in turn enhanced successive product developments (particularly in the washing sector) and in the enhancement of Smart appliances, even enabling a further integration between themselves in the so-called Smart Home.

2.3 THE HOME APPLIANCE INDUSTRY BEFORE THE 21ST CENTURY

According to the United Nations the world production of home appliances, including ovens, kitchens, fridges and washing machines, increased in 1981 from 138 million to 208 million in 1995, with an annual growth rate of 3%.

Figure 2.3 World Production Volumes of Household Appliances, over the years 1981-1995¹
(Balloni, Cucculelli, Iacobucci, 1999, p.6)



Source: UN, Industrial Commodity Statistics

Moreover, the world production of households appliances was in those years mostly concentrated in five geographic areas: Europe, North America, Asia, Africa and Oceania.

* The aggregate includes a) ovens, b)cookers, c) refrigerators d) washing machines

Furthermore, while data show a substantial stability of the production in Northern American and European areas, despite a slight decrease in the 90s, in the same years it was recorded a steep increase of the Asian production, which saw Asian producers consolidating their presence in the international landscape. Meanwhile, over the 15-years period a sharp decrease in production took place in Africa and Oceania.

Table I : Share of household appliances by world region, over the years 1981 and 1995²
(Balloni, Cucculelli, Iacobucci, 1999, p.7)

Region	1981	1990	1995
Europe	35	32	33
North America	22	20	22
Asia	30	36	40
Africa and Oceania	13	12	5
Total	100	100	100

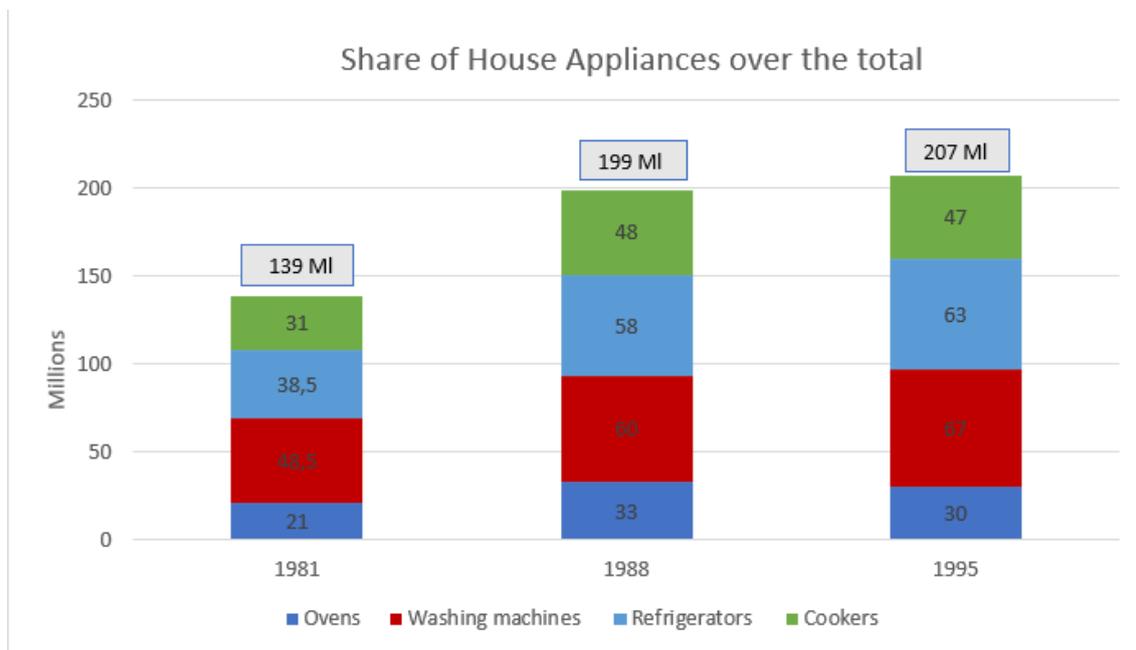
Source: UN, Industrial Commodity Statistics

Furthermore, as shown in Figure 2.2 concerning the production volumes by product category over the years 80s and 90s, refrigerators and electric kitchens were the most quantitatively relevant segments, representing on average the 60% of the home appliances production and maintaining, especially refrigerators, a growing trend over the considered years. Nonetheless, quite important was also the washing machines segment with an average share of 23% on total volumes.

Ultimately, the ovens segment, was the one with lowest production volumes, which varied over the considered years from 15% in 1981, up to 17% until 1988 and with a descending

trend until 1994 with 14%. Lower amount of ovens share might be due to the consumers' consideration of this appliance which might be thought as not essential as the others.

Figure 2.3.1 Share of household appliances by type on total, years 1981, 1988 and 1995



Source: Elaboration on *UN, Industrial Commodity Statistics data and L'industria italiana dell'elettrodomestico nel contesto internazionale* V. Balloni, M. Cucculelli, D. Iacobucci, 1999.

For what concerns Europe, the community production quote grew overall from 61.1% in 1981 to 72,6% in 1995, whereas production quotes remained fairly stable for the ex EFTA countries (Austria, Finland, Norway and Sweden) growing from 3,2% in 1981 to 3,5% in 1995 and for Eastern European countries where the production share slightly decreased from 13% in 1981 to 12,2%.

Furthermore, concerning the considered macro-areas, in the fifteen-years period a sharp decrease in the production shares was recorded for the ex-URSS countries, where the production decreased from 19% in 1981 to only 8% in 1995.

Going more into the details, within the CEE (European Economic Community) group, France, Italy and Spain experienced an increase in the home appliances production share

(aggregate containing ovens, cookers and kitchens, refrigerators and washing machines), while the UK's production share remained stable and Germany experienced a steep decrease in its production shares, falling from 20,7% in 1981 to 15,4% in 1995.

Table II: European Home Appliances production – Absolute and percentages values
(Balloni, Cucculelli, Iacobucci, 1999, p.9)

	1980-181	1990-1991	1994-1995
CEE	61,1	62,2	72,6
France	7	7,8	9,3
Germany	20,7	16,8	15,4
Italy	12,7	13,1	17,4
Spain	10,7	13,8	11,2
UK	5,1	4,1	5,4
Others	4,8	6,6	13,9
Ex EFTA	3,2	2,9	3,5
East Europe	13	13,5	12,2
Other Countries	4,1	3,7	3,5
Total V. Europe	81,3	82,3	91,8
Ex Urss	18,7	17,7	8,2
Total	100	100	100
Abs. Volumes	56704	75391	74347

Source: UN, Industrial Commodity Statistics

2.3.1 Patterns of Demand and Offer of Household Appliances in Italy

The Italian Home Appliance Industry developed starting from the second half of the 20th century. Previously, few initiatives undertaken by single entrepreneurs only maintained an artisanal character.

Therefore, the first data about the Home Appliance industry can be retrieved starting from the 50s. However, in this paragraph the attention will be mostly focused on the period 1970-2000.

Indeed, according to a study realized in the 70s, in the three-years period 1973-1975 in Italy were produced about 13 million of house appliances per year and, of these volumes, at least the 50% of production was exported, with peaks of 70% in the refrigerators segment.

Therefore, in the 70s the Italian Home Appliance industry already had a particularly important role both at national level, as share of the national production and at international level.

As a matter of fact, when comparing the share of the Italian “white goods” production with the one of other systems, such as with the European Union one (ex- CEE), in the three-years period 1973-1975, it turns out that the Italian production of refrigerators accounted for the 59% of the European production, whereas the two segments of washing machines and dishwashers respectively represented the 42% and 22% of the overall European production.

Table III: Italian production. Share of production in the CEE system, mean in years 1973-1975
(Balloni, Cucculelli, Iacobucci, 1999, p.13)

Type	Italy/CEE (nine)
Refrigerators	59
Freezers	-
Washing Machines	42
Dishwashers	22
Cookers	-

Source: *Balloni (1978)*

Furthermore, concerning the trend of the Home Appliance Industry in the period 1980-1996, three different phases might be identified:

- a) a slightly regressive phase (1980-1985)
- b) a slightly expansive phase (1986-1992)
- c) a highly expansive phase (1993-1996)

These phases were determined by different changing conditions of demand and offer. In particular, starting from the half of the 80s, after a regressive period, the economy started a new expansive cycle for the “white” goods industry, which in turn gave raise to an ulterior acceleration of the industry growth over the years 1993-1996.

First, the export growth, which pulled the industry into an expansive phase, was undoubtedly favored by the Lira currency devaluation, which allowed Italian manufacturers to enjoy a considerable competitive advantage, comparing to their European counterparts.

However, the Italian Lira devaluation took place on top of another important process, which was the change, by Italian manufacturers, of their competitive strategies. As a matter of fact, while in the first stages of the industry development, the reference market

was exclusively the national one, after the year 1985, strong of their supply chain, which developed in the previous decades, Italian producers attempted to optimize their markets shares throughout the European market.

In particular, the goal was first to obtain adequate production volumes to better exploit the related economies of scale and, second to guarantee a greater affirmation of the Italian process and product technologies, condition considered essential to conquer and to maintain the market leadership.

In particular, at the beginning of 80s, the Italian economic downturn was witnessed by a decrease of the internal demand and by a modest national markets profitability, which was remarkably inferior to the one of the other European markets.

It was during this period that Italian manufacturers suffered the most the tough concurrence of their European competitors, and yet it was the chance for national producers, as already anticipated, to reorganize, rationalize and optimize their production systems.

Tables VI, VII and VIII add a further step to the analysis, presenting for each appliance the relative data about its Production, Imports and Export Values (in euro) throughout the period 1980-1996. In particular, they shed the light on few key aspects: first, the Italian economic downturn of the 80s and the higher competitiveness of European manufacturers is confirmed by an initial decrease in 1989 of Production, Exports and Internal Consumption value; second, partially parallel to this trend, Table VII displays a growth in the share of Exported “white” goods over Production Value (ratio $E/P*100$), which might be due initially to a devaluation of the Italian currency, meaning that Italian appliances were cheaper for foreigners markets, and later on, as outlined in Table VIII by

even greater rates, to a reorganization and optimization of the Italian Home Appliance Industry production.

Furthermore, as shown in Table VIII, the subsequent increase of Production, Export and Import Values in years 1994-1996 is the result of a highly expansive phase which took place in the period 1993-1996. In addition, over the whole considered period, Italy has been a Net Exporter, having recorded a greater Export value than Imports.

Ultimately, from the variable price, which shows a decreasing trend over the considered period for each of the major appliances, it might be assumed that, first the increased values of Production, Exports and Imports were not depending on prices, but mostly on quantities and, secondly, that over the 1980-1996, Italian manufacturers had been building up production capacity, which allowed them to exploit the benefits of economies of scale, increasing quantities, decreasing production costs and consequently, market prices.

Table VI: Value of production, Exports and Imports over the years 1980-1982
(Balloni, Cucculelli, Iacobucci, 1999, p.15)

1980-1982						
	Production Value	Price	Exports Value	Imports Value	Consumption Value	E/P*100
Refrigerators	1413617625	350,3	887883750	34324500	525733876	62,8
Freezers	580262256	348,5	510567150	12546360	69695107	88,0
Washing Machines	1483578323	445,1	947215360	56975360	536362963	63,8
Dishwashers	197536087	513,1	131348480	31297880	66187607	66,5
Cookers	728414322	282,3	502265070	9034560	226149252	69,0
Total	4403408616	387,9	2979279810	144178660	1424128806	70,0

Source: Elaboration on Istat Data

Table VII: Value of production, Exports and Imports over the years 1989- 1991
(Balloni, Cucculelli, Iacobucci, 1999, p.15)

1989-1991						
	Production Value	Price	Exports Value	Imports Value	Consumption Value	E/P*100
Refrigerators	1176023488	296,6	859843400	68811200	316175600	73,1
Freezers	537471892	294,8	334926880	26829530	202545012	62,3
Washing Machines	1546325099	338,2	1046114460	79143480	500227380	67,7
Dishwashers	279913029	352,54	192134300	48650520	87782460	68,6
Cookers	527752689	227,9	465082670	9114800	62664250	88,1
Total	4067486198	289,4	2898101710	232549530	1169394702	72,0

Source: Elaboration on Istat Data

Table VIII: Value of production, Exports and Imports over the years 1994- 1996
(Balloni, Cucculelli, Iacobucci, 1999, p.15)

1994-1996						
	Production Value	Price	Exports Value	Imports Value	Consumption Value	E/P*100
Refrigerators	1315367175	241,44	1054609920	316527840	260757255	80,2
Freezers	554398405	248,39	411333840	173624610	143064565	74,2
Washing Machines	1992037009	293,21	1600340180	460632910	391696829	80,3
Dishwashers	528577109	325,88	393988920	173368160	393988920	74.5
Cookers	779195566	192,92	691425280	116523680	87770286	88,7
Total	5169575266	260,36	394984352	11159595	1219731746	79.58

Source: Elaboration on Istat Data

Last, the analysis about the period 1950-2000 ended up identifying the destination countries of the Italian production of Household Appliances.

As shown in Table XI, in years 1980-1981, the Italian production was mostly directed towards: Northern European countries - such as Finland, Norway, Sweden, Denmark and Netherlands mostly importing Refrigerators, Freezers and Washing Machines; – to Southern European countries such as France, Spain, Portugal, Greece and Turkey, receiving, in comparison to the previous group of countries, an additional equally important quote of Cookers production and, ultimately, to the UK market which accounted along with Belgium and Ireland for the 18.3% of the exported production, mostly importing Washing machines, Refrigerators and Freezers. In addition, a still important quote of export 33% was still destined to Extra EU countries.

Afterwards, in years 1986-1987, the share of Italian exported production of Household appliances destined to European Countries increased from 66,1%, in 1981, to 82,7%, with a remarkable increase for all of the mentioned relevant markets and a steep decrease in the share of production destined to Non- European countries.

To end with, the years 1996-1997, saw the overall amount of production destined to European countries remaining substantially stable – 83,6 % of total exports -, with only two exceptions concerning their distribution within the same group: first a sharp decrease of the share of imported “white” goods by UK and Belgium, from 25,8% down to 15,5% and, second, a surprisingly steep increase in the amount of imported “white” goods by Eastern European countries, towards which exports raised from 0.9%. in 1987, up to 15,1% in 1997.

Table IX: Italian Exports of Household appliances by geographic Area
(Balloni, Cucculelli, Iacobucci, 1999, p.15)

Exports			
	1980-1981	1986-1987	1996-1997
Northern Europe*	28	31,4	28,3
Southern Europe*	19,6	24,6	24,8
UK Ireland and Belgium	18,3	25,8	15,5
East Europe***	0,2	0,9	15,1
Europe	66,1	82,7	83,6
USA e Canada	0,8	1,5	0,2
East Asia, Japan, Australia	0,5	0,2	1
Northern Africa, Arabs	2,6	5,5	3,2
Others	29,9	10,1	11,9
Total Extra EU countries	33,9	17,3	16,4
Total	100	100	100
Volume (X 1000)	8.221	7.874	15776

Source: Elaboration on ANIE data, ISTAT

* Scandinavian Countries, Denmark, Netherlands, Germany

** France, Spain, Portugal, Greece, Turkey

*** For the two years 1980-1981 the data includes also Yugoslavia

2.3.2 Market structure, strategies and performances

When dealing with industry studies few challenges should be correctly addressed. First, it is important to identify relevant factors and mechanisms affecting the offer structure and its evolution, with particular attention to the industry concentration. And second economists should attempt to assess the nature of the concurrence between enterprises, including those factors affecting its intensity and its consequences on businesses' performances (Balloni, Cucculelli, Iacobucci, 1999, p.39).

2.3.2.1 Concentration processes in Europe

Over the years 70's and 80's, the European sector of Home Appliances experienced a process of rapid concentration. Already in 1985, the first four producers of domestic appliances controlled over the 40% of the European Market, raised to 65% in the mid-nineties (Balloni, Cucculelli, Iacobucci, 1999, p.43).

Moreover, the concentration process took place mostly by the acquisition mechanism rather than through a process of internal growth of the single businesses.

The reasons are mostly imputable to two main facts: first, companies were aiming at exploiting their production capacity excess and, second, the market recognized a certain degree of reputation to the already existing brands.

In particular, concerning the former element, production capacity excess, it must be observed how, starting from the Seventies', the sector has displayed a persistent situation of underutilized production capacity, which in turn, was the result of two other phenomena: a) the huge investments undergone by companies in the 80's, in order to face high demand growth rates, which ultimately turned out to be inferior to the estimated ones and b) the modernization of production systems, which despite being based on a more intensive use of capital (deepening) instead of human labor, because of the new technologies employed, caused a parallel widening of the production base. Nonetheless, the widening of the production capacity base empowered the pressure on prices, which, especially during the recessive phase experienced by the Italian economy at the beginning of the nineties, caused an appreciable erosion of profit margins³ (Treschow, 1998, p. 91).

³ Treschow (Electrolux) on average there has been a price reduction of about the 10% over the period 1993-1996, "Appliance", March 1998, p.91

Furthermore, concerning the second aspect, that is Brands' reputation, it has to be outlined how for existing brands it is generally hard to expand their market share, because of consumers fidelity to already affirmed ones. This implied the choice, by companies willing to increase their market share or simply to enter a new market, to acquire the already existing brands, within the target market. By doing so, buyer companies could directly exploit the acquired brand's reputation and customer awareness, rather than directly trying to conquer new customer segments, which would be riskier and more expensive. However, this common strategy was not exempt from exceptions. For instance, the famous brand Whirlpool, after having acquired Philips' home appliance division in 1989, launched its own advertising campaign to affirm its brand within the European market, with a marketing expenditure of 112 million dollars in three years. The operation, geared at affirming Whirlpool brand in Europe, is considered one of the most ambitious ever attempted.

Similarly not exempt from risks, it is considered the elimination process of already existing brands.

The outcome was an increasingly higher sales concentration when referring to the number of groups controlling the market, whereas sales concentration was lower when referring to the single brands.

Tables X, XI, XII below, respectively display the chronology about the main mergers and acquisitions which took place over the years 1988-1997, the main Home Appliance producers by brand and ultimately the Market share recorded by the main European Home appliance producers over the years 1986-1996.

Table X: Main mergers and acquisitions in the European Home Appliance market, period 1988-1997
(Balloni, Cucculelli, Iacobucci, 1999, p.45)

Year	Acquiring brand	Operation	Acquired company and brands
1988	Electrolux (S)	Majority acquisition	Alfatec (I)
1988	Electrolux (S)	Majority acquisition	AlpenInox (I)
1988	Merloni Elettrodomestici (I)	Majority acquisition	Indesit (I)
1988	Ocean (I)	Majority acquisition	Filiberti (i)
1988	Ocean (I)	Majority acquisition	Bonnet (F)
1988	Ocean (I)	Majority acquisition	Satam Brandt (F)
1989	Whirlpool (USA)	Joint venture with Philips (53%)	Home Appliance Philips
1989	Maytag (USA)	Majority acquisition	Hoover (UK)
1989	Merloni Elettrodomestici (I)	Majority acquisition	Scholtès (F)
1989	GE (USA)	Majority acquisition	Hotpoint (UK)
1990	Whirlpool (USA)	Acquisition completion	Aspera (I)
1991	Merloni Elettrodomestici (I)	Majority acquisition	Philco (I)
1991	Whirlpool (USA)	Acquisition (47%)	Home Appl. Philips
1992	ELFI (I)	Majority acquisition	Thomson Elektromanager (F)
1992	ELFI (I)	Majority acquisition	Blomberg (D)
1992	ELFI (I)	Majority acquisition	Technibell (F)
1992	Candy (I)	Majority acquisition	Otsein (E)
1992	Whirlpool (USA)	Majority acquisition	Tatramat (Slov)
1992	Merloni Elettrodomestici (I)	Minority acquisition	Pekel (Tur)
1993	Merloni Elettrodomestici (I)	Majority acquisition	Pekel (Tur)
1993	Candy (I)	Majority acquisition	Iberna (I)
1994	Merloni Elettrodomestici (I)	Minority acquisition	Star ((I)
1994	Electrolux (S)	Acquisition	AEG (D)
1994	Bosch-Siemens (D)	Acquisition	Gaggenau ((D)
1995	Candy (I)	Acquisition (by Maytag)	Hoover (UK)
1995	Samsung	Acquisition (47%)	Foron Hauesgerate (D)
1997	Merloni Elettrodomestici (I)	Maj. Acq. ulterior 40%	Star (I)

Source: Specialized print on Corporations' data

Table XI: Main Home Appliance producers in Europe and Brands utilized in the European Market
(Balloni, Cucculelli, Iacobucci, 1999, p.46)

Group	Brands	Positioning	Geographic Area	
Electrolux (S)	Electrolux	Medium-high	Global	
	Zanussi/ Rex	Medium	Europe	
	AEG	Medium-high	Europe	
	Acec/ Arthur Martin/Atlas Buderus/Castor Corbero/Elektra /Elektro Helios/Faure			
	Frigidaire/Gibson/Husqvarna			
	Juno/ Lux/ Marynen/Moffat			
	Nordton/Parkinson/Cowan Tappan/ Therma			
	Tricity-Bendix/Voss/ Zanker/ Zoppas			
	Bosch-Siemens (D)	Bosch Siemens	Medium-high	Global
		Profilo	Medium	Turkey
Balay		Medium	Spain	
Neff/Gaggenau		High (Built-in)	Europe	
Constructa		Medium	Germany	
Pitsos		Medium	Greece	
Crolls				
Whirlpool Europe (USA)	Whirlpool	Medium	Global	
	Bauknecht	Medium-high	Germany	
	Ignis	Medium	Europe	
	Laden	Medium	France	

Merloni Home Appliances (I)	Ariston	Medium	Europe
	Sholtès	Mid-high (Built in)	France/Benelux
	Indesit	Medium	Europe
Elfi/Brandt (I)	Brandt	Medium-high	France
	De Dietrich /Sauter/Thermor	Built-in	France
	Thomson	High	France
	Vedette	Medium-high	France
	Blomberg	Medium-high	Germany/ Denmark
	Elektra Bregenz	Medium	Austria
	Ocean/Samet		
	San Giorgio	Medium-high	
Candy (I)	Candy	Medium	Europe
	Hoover	Medium-high	Europe
	Rosières	Medium-high (Built in)	Europe
	Iberna		Europe
	Kelvinator/Gasfire		
	Otsein/Zerowatt		
General Electric	GE/Hotpoint/ Creda		

Source: Specialized print on Corporations' data

Ultimately, despite being data about market share not completely reliable, from Table XII it is evident how the market tends towards concentration, even if the latter is difficult to measure.

Furthermore, these quotes, calculated on the entire market, hide huge differences in the national markets and for different market segments. For instance, Electrolux and Whirlpool had the most homogenously distributed market share between different

countries, whereas Bosch, Siemens and ELFI/Brandt were the most concentrated within their national markets (Balloni, Cucculelli, Iacobucci, 1999, p.49).

Table XII: Market share recorded by the main European Home appliance producers, 1986-1996
(Balloni, Cucculelli, Iacobucci, 1999, p.46)

Brand	1986	1988	1991	1994	1995	1996
Electrolux	15	22.7	20	22.5	26	25
Philips	13	13.2				
Bosch- Siemens	8	12.3	14	15	16	16
Whirlpool			13	14	12	15
AEG (bought by Electrolux)	4		5			
Indesit (bought by Merloni E.)	4					
Merloni Elettrodomestici	3	11.4	4	8	10	10
EL.FI Brandt		5.9		10.5	9	10
Candy	3	6.4	5	6.5	5	
Miele	3	2.3	4	3		
General Electric/GDA		2.7	4	3	5	
Hoover(bought by Maytag/Candy)	2					
Thomson Electroménager (by ELFI)	6		12			
CR4	42	60	59	62	64	66

Source: V. Balloni, M. Cucculelli, D. Iacobucci, 1999, *L'industria italiana dell'elettrodomestico nel contesto internazionale*, G. Giappichelli Editore – Torino, pag.47

Last, despite the analyzed tendency of the European Home Appliance market towards an increasingly higher concentration, the European market appeared considerably more fragmented than the US market, where the first four producers detained the 90% of the “white” goods production. The European market higher fragmentation is the result of a high specificity of the single national markets, which display differences for demand characteristics, products typologies and distribution organization. These differences reduce the opportunity for an exploitation of production and marketing economies of scale, favoring brands adopting nationally based strategies (Balloni, Cucculelli, Iacobucci, 1999, p.46).

2.3.2.2 Competitive Strategies

As already mentioned in the previous paragraph, over the period 1970-1990, many companies had to choose whether competing at global level, with a less national suited offer, or competing in specific markets, forgoing the possibility to compete globally or internationally because of their offer specificity.

According to V. Balloni, M. Cucculelli and D. Iacobucci (*L'industria italiana dell'elettrodomestico nel contesto internazionale*, p. 62) with particular reference to the globalization phenomena, it was possible to divide companies operating in the European market in strategic groups, distinguishing them according to the geographic wideness of the market where they decided to compete. The hypothesis was that this element would influence companies' strategic choices and, ultimately, their performances (Balloni, Cucculelli, Iacobucci, 1999, p.46).

Hence, according to the three authors, it was possible to identify within the European market three main strategic groups:

- **Global enterprises:** which include all of those companies pursuing as a policy the one of being present on all the main markets systems (Europe, North America, Asia and Latin America). To this group belonged Electrolux, Whirlpool and Bosch-Siemens.
- **European Enterprises:** which are all the companies aiming at consolidating their position especially on the European market, while the presence on other markets is mostly owed to exports. This group encompasses companies such as: Merloni Elettrodomestici, ELFI/Brandt and Candy.
- **National enterprises:** the group comprises all of those companies having a significant position in a certain national market. Even in this case, the presence in other markets and

countries is guaranteed by exportations. This group encompassed companies such as Fagor (Spain) and GEC (UK).

Generally all of the considered companies cover in their reference geographic area, all of the “white goods” product range. However, there are also companies specialized in specific segments, and they are referred to as “**Niche**” enterprises. It is, for instance, the case of Miele and Smeg, which are competing on the high-end segment. In addition, another group encompasses **companies producing for third parties**.

Ultimately, overall, over the nineties, according to the data presented by V. Balloni, M. Cucculelli and D. Iacobucci, the strategy which payed off the most in terms of profits was the one of focusing on a specific geographic area (Europe) or even more profitably on a specific market segment (as done by Smeg, IAR-Siltal and Antonio Merloni), rather than on globalization strategies (pursued by Electrolux and Whirlpool).

2.3.2.3 Competition Dynamics in the Sector

If from a profitability analysis conducted on single companies, the assessment moves on with an analysis of the European Home Appliance profitability, one must conclude that industry profitability in the European continent is much lower than the one registered, for instance, in the US. The reasons are imputable, especially during the nineties, to a low demand rate growth of, accompanied by an enhancement of the production capacity, which in turn resulted in under-utilized production capacity, constraining manufacturers to aggressive price policies in order to maintain high production volumes. Furthermore, since the market was and it is still characterized by a low demand elasticity to price, a decrease in prices ultimately caused profits erosion.

Furthermore, despite the sector already displayed the characteristics of a mature oligopoly, an oligopolistic coordination still seemed unlikely, with consequently low

profit margins. Among the main reasons of a lack of oligopolistic coordination, was the asymmetry in group's strategic visions. Most of them, despite competing on Global rather than European or national markets, were ultimately competing within the same market segments. As a matter of fact, while remaining very high the industry entry barriers, there were within the industry no barriers between different strategic segments. Higher entry barriers between different segments would have determined a greater difficulty to freely move within the industry, reducing the competitive pressure.

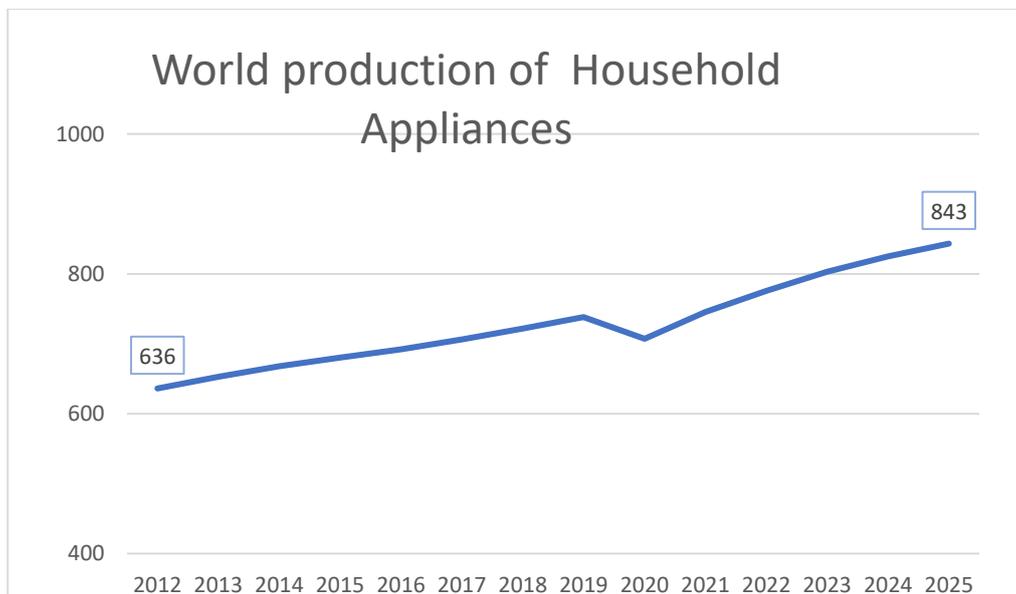
2.4 THE HOME APPLIANCE INDUSTRY IN THE 21ST CENTURY

As the previous paragraph revised the Home Appliance Industry features and trends over the years 80s and 90s, in this paragraph it will be examined the evolution of the Industry in the 21st century.

First, according to the data bank Statista, the world production of home appliances, including ovens, kitchens, refrigerators, washing machines and tumble dryers, increased in 2012 from 636 to 738 million in 2019 and it is esteemed to grow up to 843 million by 2025, with an annual average growth rate of 2.21%

In particular the comparison between Figure 2.3 and Figure 2.4 shows how the production over a forty-five years period has grown exponentially, from 139 million in 1981 to 843 million in 2025. Also the average annual rate of growth has mostly remained stable throughout the years passing from 3% in the period 1981-1995 to 2.2% in the period 2012-2025.

Figure 2.4 World Production Volume of Household Appliances, over the years 2012 -2025



*Source: Data extracted from Statista for Major Appliances**

Moreover, the world production of home appliances has remained even in the period 2012-2025 mostly concentrated in the same five geographic areas: Europe, North America, South America and Asia. Furthermore, whilst data show a substantial stability of the production in Northern America, Europe, despite a slight decrease in the forecasted production due to Covid 19 for all the aggregates, Asia seems to have lost about the 1,78% of production share (including the estimation for year 2023).

Ultimately, over the thirteen-years period a slight increase in production took place for Southern American countries, which increased their production by 1.57 %.

Table III: Share of household appliances by world region, over the years 2012 and 2023

Region	2012	2015	2019	2023
Europe	29,92	30,01	30,03	29,91
North America	11,20	11,47	11,55	11,42
Asia	46,12	45,37	44,77	44,34
South America	12,76	13,15	13,64	14,33
Total	100	100	100	100

Source: Data extracted from Statista

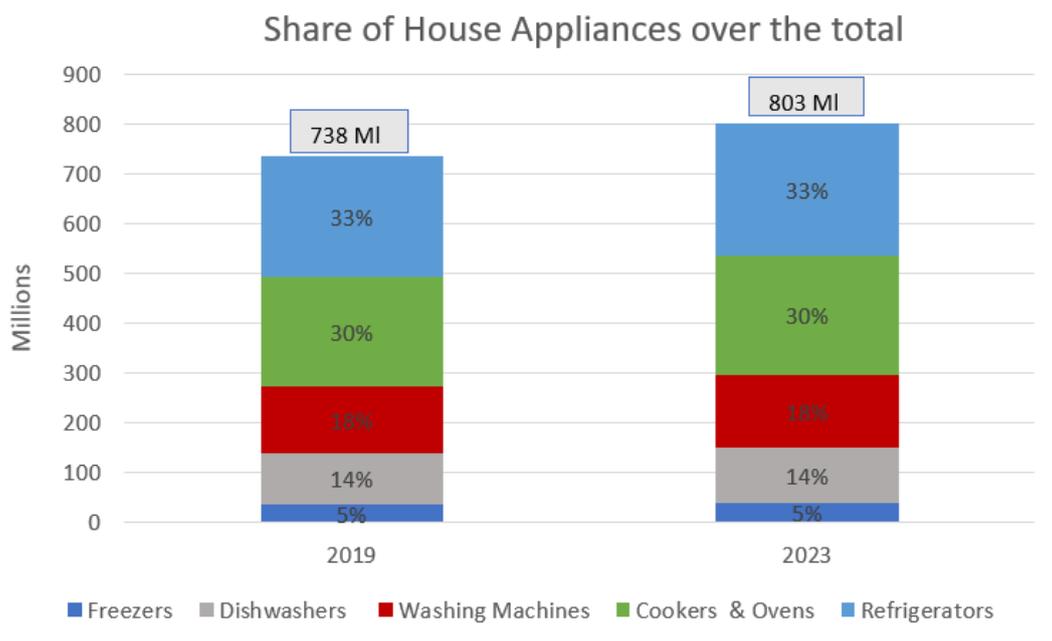
Furthermore, as shown in Figure 2.2 concerning the production volumes by product category over the years 2019-2023, the two segments Refrigerators and Cookers-Ovens are the most quantitatively relevant segments, representing over the 60% of the home appliances production and maintaining a growing trend over the considered period.

Nonetheless, quite important is also the washing machines segment with an average quote of 18% on total volumes, which is however inferior to the share recorded in the years 1981-1995 amounting on average to the 23% of the whole production.

Another appliance that has increased its production volumes over the years has been the one of Dishwashers, representing about the 14% of the whole home appliances production.

Ultimately, the Freezers segment, is the one with the lowest production volumes, which recorded over the considered years a 5% on total volumes in 2019, quote predicted to remain stable even in 2023.

Figure 2.4.2 Share of Household Appliances by type on the total, years 2019 and 2023



Source: Source: Data extracted from Statista

A further analysis which was carried out, consisted of verifying, through an estimation of the year 2020 Home Appliances World production, the actual contribution of each country to the whole major Appliances world production. In particular, looking at the upper portion of the table, it is possible to notice how the three top positions are occupied by giants such as China, India and United States. Overall, the first twenty countries in the list contribute to the 74,4% of the world production of domestic appliances.

Furthermore, European countries such as Germany, Great Britain, France and Italy despite still classifying among the top twenty positions, and therefore largely contributing to the world home appliance production, appear only from the tenth position on.

Table IV: World Major Home Appliances production by Country estimated in year 2020

Year 2020			
Position	Country	Volume	Share by country
1	China	163497840	23,36
2	India	77500397	11,07
3	USA	51966471	7,42
4	Brazil	32326568	4,62
5	Indonesia	20477883	2,93
6	Japan	20380012	2,91
7	Nigeria	16602878	2,37
8	Messico	15540784	2,22
9	Russia	15098734	2,16
10	Germany	13963253	1,99
11	Great Britain	12088979	1,73
12	Pakistan	11292421	1,61
13	France	11174682	1,60
14	Turkey	9776634	1,40
15	Bangladesh	9692292	1,38
16	Egypt	8874528	1,27
17	Philippines	8430409	1,20
18	Vietnam	7777837	1,11
19	Italy	7416436	1,06
20	Iran	7116810	1,02
	Total top 20	520995849	74,4

*	Others	179004151	25,6
	Total Worldwide	700000000	100,0

Source: Source: Data extracted from Statista, estimation taking into account COVID-19

For what concerns the European continent, overall the Central European countries saw their production quote growing from 61.1% in 1981 to 72,6% in 1995, and to 75,63% in 2020, whereas production quotes remained fairly stable for the Scandinavian countries (Finland, Norway and Sweden- Ex EFTA) growing from 3,2% in 1981 to 3,5% in 1995 and to 5,91% in 2020 .

In addition, Eastern European countries experienced a considerable growth of their production share, which raised from 13% in 1981 to 13.49% in 2020, despite a slight productivity loss during the 90s, probably due to the Yugoslavia disaggregation process and to the conflicts which interested the Balkan area in those years.

Furthermore, in the fifteen-years period a sensitive decrease in the production share was recorded for the ex-URSS countries, where production fell from 19% in 1981 to only 8% in 1995 until 4.97% in 2020.

Going more into details, within the Central European group of countries, France, Italy and Spain experienced an increase in their home appliances production share (aggregate containing ovens, cookers-kitchens, refrigerators and washing machines), the UK's production share remained stable, whereas Germany experienced a steeper decrease in its production shares, falling from 20,7% in 1981 to 16.84% in 2020.

In addition, the increase in the production share of Scandinavian countries, which correspond in Table II, to the Ex EFTA Group - without Austria and with an additional country, Denmark - might be even greater if considering that Austria accounted for a great share of production within the Ex EFTA Group, which is not considered in the 2020 data.

Moreover, it is important to remark a consolidation of the importance of some Eastern European countries such as Poland and Romania, which if on the hand belonging to the European Union, ensure homogeneous standards and certainty in the EU Regulation application and provide educated human capital, on the other hand represent for many foreign companies an opportunity for production costs reductions, often outsourcing activities where a lower degree of specialization and less specific knowledge or capital requirements are needed.

Table V : European Major Household Appliances production by countries, estimated for year 2020

Year 2020			
Area	Country	Volume	Production share
Central Europe	Germany	13963253	16,84
	Great Britain	12088979	14,58
	France	11174682	13,48
	Italy	7416436	8,95
	Spain	5228859	6,31
	Netherlands	3839724	4,63
	Belgium	2055378	2,48
	Austria	1943879	2,34
	Others	4994055	6,02
	Total	62705246	75,63
Scandinavian Countries	Sweden	2001366	2,41
	Norway	1003590	1,21
	Finland	958994	1,16
	Denmark	936976	1,13
		Total	4900926

East-Balkan Area	Poland	3374405	4,07
	Romania	2960084	3,57
	Czech Republic	1416510	1,71
	Hungary	1010396	1,22
	Others	2421779	2,92
	Total	11183174	13,49
EX Urss	Ucraina	2683848	3,24
	Bielorussia	762168	0,92
	Others	672188	0,81
	Total	4118204	4,97
	Total Volume	165815100	100

Source: Elaboration on Statista's Data

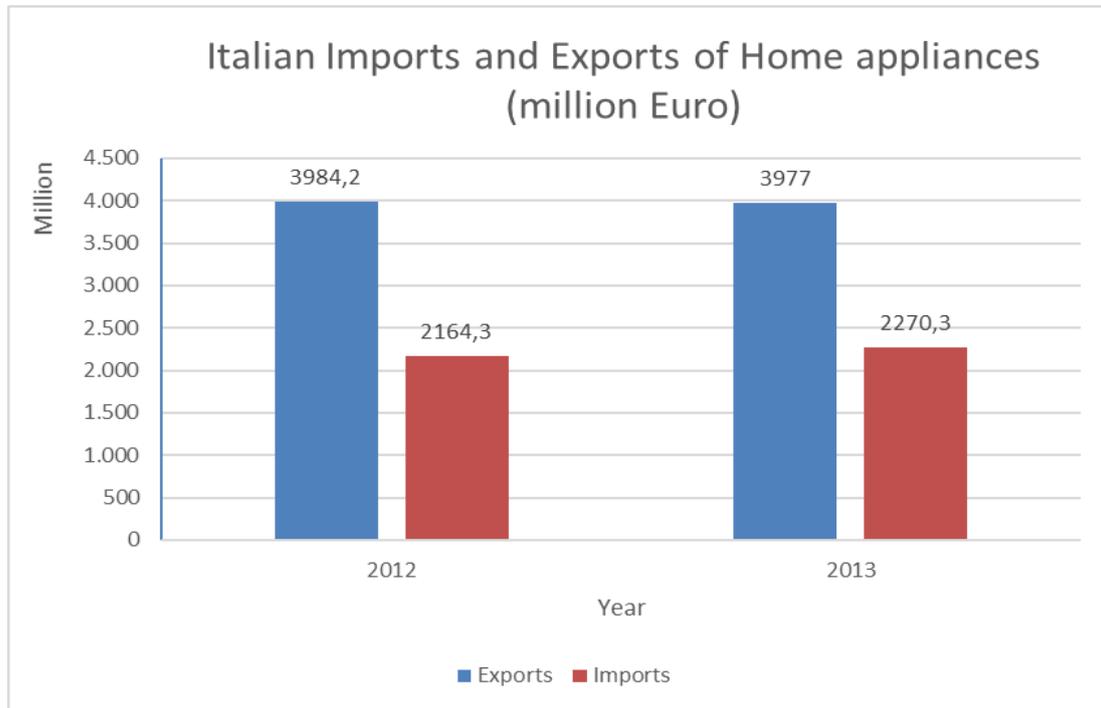
2.4.4 Patterns of Demand and Offer of Household Appliances in Italy

Furthermore, looking at 2020 data, it might be inferred, similarly to what was previously done for the two-year period 1973-1975, that the Italian production represents, compared to other major systems, taking for instance the ex CEE group of countries (France, Germany, Italy, Netherlands, Belgium, Denmark, Luxembourg and Ireland) for a better comparison, about 15% of the overall production of home appliances.

In addition, Italy is one of the top producers and exporters of white goods in the world along with China and the United States and last Germany which, in Europe, precedes it.

In particular, Table 2.4.2.1 shows the relation between Imports and Exports over the years 2012 and 2013. Overall, the data show, in the two-year period, a slight decrease in Exports and a proportional increase in the imported quantities of Home Appliances.

Figure 2.4.4 Italian Imports and Exports of Home Appliances



Source: Elaboration on Statista data

Going more into the details, it is possible to analyze the country destinations of Italian Exports, in the period 2012-2013. Table shows the Italian “white” goods top export countries.

Overall, the Export value was inferior in year 2013 comparing to 2012, with a higher decrease of exports towards European destinations. Nonetheless, still the bulk of Exports, about the 66,1%, when considering only the countries belonging to the political European Union, and 80% considering European Union in the geographic sense, was directed to EU destinations.

Among the ten main destinations country there are, in order: Germany, France, Great Britain, Russia, the Netherlands, Spain, Poland and Sweden, which however all recorded a negative variations in their relative Export shares, besides Germany a Sweden, displaying a growth over the considered period.

Table VI: Italian Export of white goods (million Euros)
<https://www.hafactory.it/2014/06/09/where-do-italian-household-appliances-go/>

Country	2012	2013	<u>2013/2012 % Δ</u>	2013 % share
Germany	634.5	636.2	0.2	16.0
France	532.7	501.8	- 5.8	12.6
Great Britain	338.2	306.2	- 9.5	7.7
Russia	203.6	198.2	-2.7	5.0
The Netherlands	196.9	193.1	- 1.9	4.9
Spain	172.1	168.3	- 2.2	4.2
Poland	158.8	149.6	- 5.8	3.8
Sweden	132.8	140.2	5.6	3.5
Switzerland	139.1	135.4	- 2.7	3.4
Australia	115.9	108.6	- 6.3	2.7
Europe 28	2,668.6	2,627.2	- 1.6	66.1
Total Europe	3,148.5	3,101.1	- 1.5	80.0
World	3,984.2	3,977.0	- 0.2	100.0

Source: ISTAT

Ultimately, for some traditional destinations the drop in Exports might be due to the increasing competition of products coming from Far East.

For what concerns Italian Imports, it has been observed a constant growth over the last years.

In 2013, Home Appliance Imports came mostly from the European continent, recording 65.1 % on the total, with 56.9 % constituted by only the European Union nations in the narrowest sense.

Table VII : Italian imports of white goods (million Euros)
<https://www.hafactory.it/2014/06/09/where-do-italian-household-appliances-go/>

Country	2012	2013	2013/2012 % Δ	2013 % share
China	721.4	695.0	-3.7	30.6
Germany	382.5	368.4	-3.7	16.2
Poland	233,3	289.7	24.2	12.8
Turkey	169.9	168.6	- 0.8	7.4
Romania	97.8	137.4	40.5	6.1
France	130.6	135.0	3.4	5.9
Europe 28	1,154.1	1,292.2	12.0	56.9
Total Europe	1,340.7	1,477.5	10.2	65.1
World	2,164.3	2,270.3	4.9	100.0

Source: ISTAT

Furthermore, looking at the single countries shares, China occupies the first position, with about 30.6% over the total. Other countries appearing in the top positions are: Germany, Poland, Turkey and Romania. Of the latter group it is relevant to mention the outstanding growth of imports from nations such as Polonia (% Δ +24,2%) and Romania (% Δ +40,5%).

Ultimately considering the provenience od Italian “white” goods imports, it might be concluded that they mostly come either from the European continent (65,1%) or from China (30,6%), with rest of world representing only 4,3% over the total.

Moving on with the analysis, Figure 2.4.4.1 shows the sold production value of Household Appliance by category. First, according to data the Washing and Drying machines segment accounts for the most of the sales value over the period 2011-2018, followed by ovens, dishwashers and refrigerators. Second, it is worth to mention how, over the considered period, the sales value has experienced a steady decrease, especially

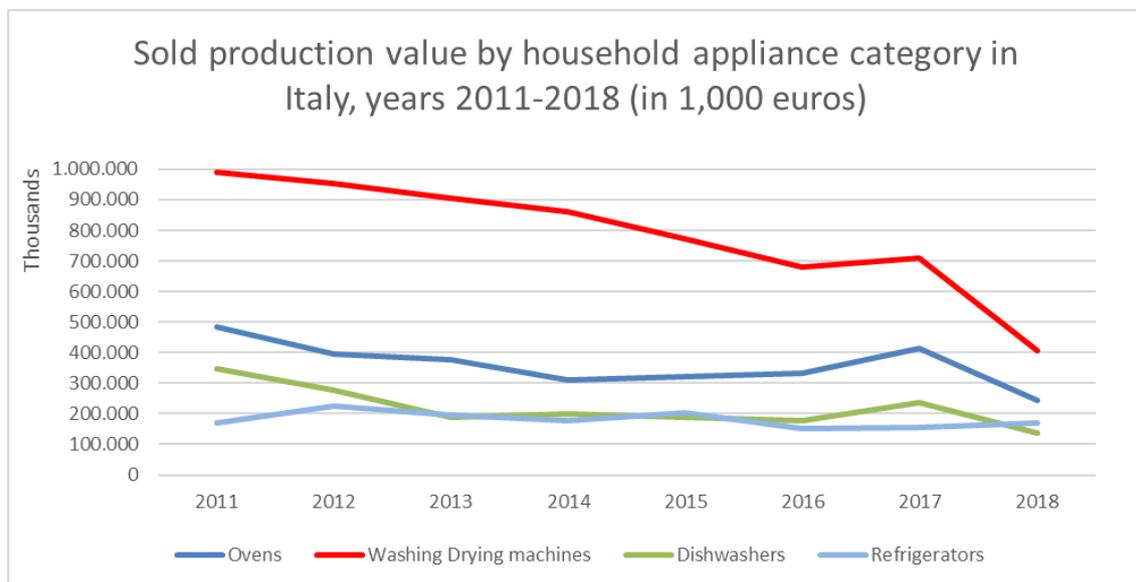
for those segments such as washing and drying machines and ovens, which initially had the best results. In particular, for the former segment the sold value decreased from the initial 1 mln euro to 400.000 euro in 2018, about 60% less.

In addition, also the segments of ovens and dishwashers experienced a steep decrease, seeing their sold production value falling respectively for -60,72% and -49,84%. Much lower was the sold production value decrease experienced by refrigerators, about 16%.

Ultimately, it is evident how the total production value has decreased for all the considered categories, with a steeper decline in 2017.

This decline could be attributed, with a good degree of approximation, to the economic instability over the years 2010-2015, which has negatively affected the Italian economy and, consequently, also the Home Appliance industry with its sales.

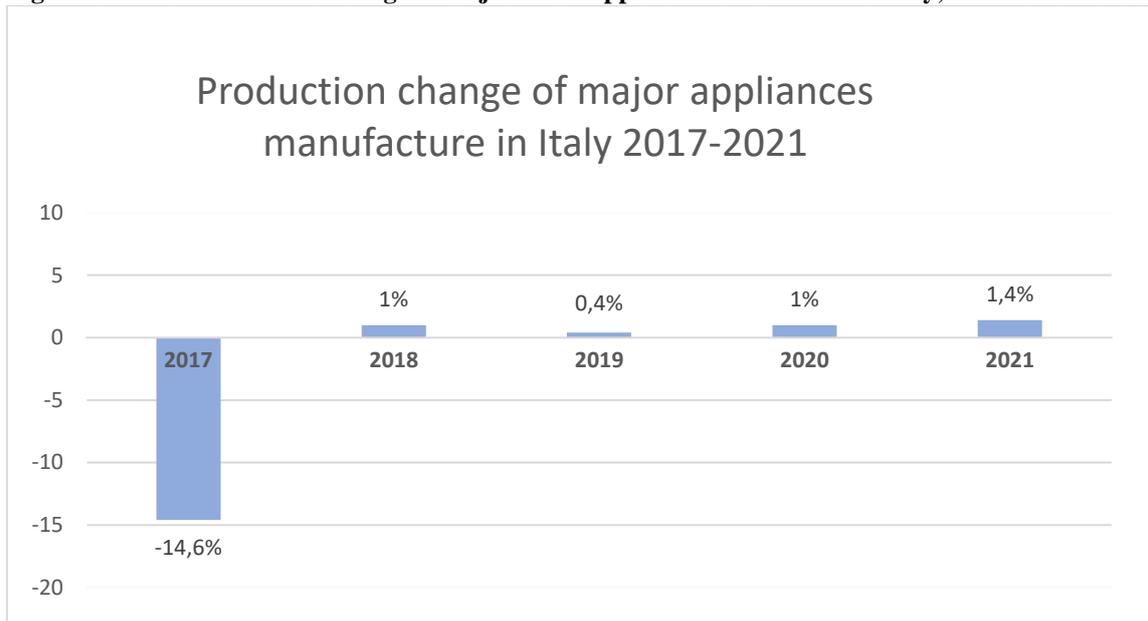
Figure 2.4.4.1: Production change of major home appliance manufacture in Italy, Years 2017- 2021



Source: Elaboration on Statista data

Furthermore for what concerns the production of major home appliances, data contained in Figure 2.4.4.2 seem to confirm what it has been seen previously, that is a steep decrease in production (by 14,6%) which took place in 2017, comparing to year 2016.

Figure 2.4.4.2: Production change of major home appliance manufacture in Italy, Years 2017- 2021



Source: Elaboration on Statista data

Therefore, the decrease in production seems to be just the supply-side adequation to the yearly sales forecasts, and to the drop in demand which took place in 2017.

This means that sales value in 2017 mostly decreased because of a demand contraction, while it is uncertain the role of price in the equation.

Nonetheless, it is worth to notice that, despite the quantitative drop in production in 2017, the production of major home appliances has continued to grow in the following periods, despite the low rates.

More specifically, the low rates at which the production recovery took place might be due to two main reasons: first, the still ongoing consequences of the economic instability which could have caused capacity constraints (activities dismissal) and a slow recovery of demand and second, since production is only a reflection of demand, to the market's high saturation, which is typical for mature markets. The latter could have in turn implied low recovery rates for demand and consequently a slow growth in production quantities, even with more favorable market conditions.

2.4.5 Market structure, strategies and performances

2.4.5.1 Concentration processes in Europe

During the first years of the 21st century, the European Home Appliances Industry continued its process of concentration. In 2019, the first seven major groups detained about the 85.5% (and 83% in units) of market share value, about the 20% more if compared to the data recorded in the mid-nineties.

Moreover, once again the concentration process took place mostly by the acquisition mechanism rather than through a process of internal growth of the single businesses.

Still the reasons might be attributed to a) spare production capacity, owed to the economic downturn experienced by global economy over the period 2007-2015, and to the trial by major players to optimize capacity utilization and factory efficiency, obtaining relevant gains. Furthermore, it was confirmed the choice by the main Groups to expand through the acquisition of existing brands, in order to exploit their already existing reputation.

Even Whirlpool, the American Group that in the mid-nineties attempted to enter the European market directly through its own marketing campaign, trying to directly affirm its own brand, had to partially revise its decision. As a matter of fact, the Corporation decided in 2014 to consolidate its global position by acquiring Indesit and Hotpoint (previously acquired by Indesit in 2001) brands in Europe, taking over the control from Merloni family. This move allowed the Group to finally enter the European market, which for long had resisted major gains for Whirlpool. In particular, the acquisition was possible after Indesit (Ex Merloni Elettrodomestici) was defeated by the competitor Arcelik, seeing its factory locations and agreements turning from strengths into liabilities, with a considerable over capacity compounded by heavy market wide competition on price (Euromonitor, 2015).

In addition, as reported by Table VIII the beginning of the new century was marked by another important merger Moulinex-Elfi-Brandt, which only one year after, led to the whole Group bankruptcy declaration, and ultimately to the Group's death, because of excessive liabilities.

Moreover, another brand which over the years continued its expansion on European and Global markets was the Italian Candy. From 2005 to 2013 a series of acquisitions led the company to expand first into Russia, then to China and to Turkey, respectively through the acquisition of the Brands Vyatka, Jinling, Hefei Meiling Co.ltd, Susler and the purchase of the British/European Brand Baumatic.

Ultimately, always referring to the main acquisitions, the Chinese Haier is another global player, which has recently turned its attention to the European market, acquiring along with their respective brands, GE in 2016 and Candy Hoover in 2019.

Table VIII: Main mergers, acquisitions and other operations in the European Home Appliance market, 2000-2019

Year	Brand	Operation	Acquired company and target brands
2000	Moulinex	Merger	Elfi-Brandt
2001	Moulinex-Elfi-Brandt	Bankruptcy	
2001	Merloni Elettrodomestici (new Indesit)	Acquisition	Hotpoint
2005		Naming substitution	Indesit
2005	Merloni Elettrodomestici	Acquisition	Vyatka
2006	Candy	Acquisition	Jinling
2006	Candy	Acquisition	Susler
2007	Candy Indesit	Division	Merloni Termo Sanitari(MST)
2007	Ariston (Indesit Group)	Naming definition	Hotpoint-Ariston
2009		Naming definition	Ariston thermo group
2011	Merloni Termo Sanitari(MST)	Naming substitution	Ariston (definitive elimination)
2011	Hotpoint	Acquisition	Dely

2013	Arcelik Candy	Acquisition	Baumatic
2014	Whirlpool	Acquisition	Indesit
2015	Electrolux	Acquisition	Kelvinator
2014-2017	General Electric	Acquisition	10 minor Brands
2016	Haier	Acquisition	General Electric (GE)
2019	Haier	Acquisition	Candy- Hoover

Source: web and Groups' websites

Therefore, Table IX shows after the new 21st century wave of acquisitions, the present Groups composition by brand.

What is important to mention is the relevance that Far East competitors, such as the Chinese Haier and the two South Koreans Samsung and LG have assumed, comparing to the same data collected in the nineties, when these players did not even appear on the European market of household appliances.

Nonetheless, the beginning of the century has also been marked by the progressive disappearance of some European Groups such as Elfi-Brandt, and by a definitive change of ownership of other important National ones such as Indesit, which was ultimately purchased by Whirlpool and Candy-Hoover, acquired by the Chinese Haier.

Table IX: Main Home Appliance producers in Europe and Brands utilized in the European Market

Group	Brands	Geographic Area
Whirlpool Group (US)	Whirlpool	Global
	Indesit	Europe
	Hotpoint	Europe
	Bauknecht	Europe
	Maytag	Northern America
	Scholtés	France
Haier Group (C)	Haier	Global
	Candy	Europe
	Hoover	Europe
	Rosières	France/Europe
	GE	
	Iberna/ Baumatic/ Vyatka	Europe
	Otsein/Zerowatt/ Jinling/ Susler	Europe/Asia
	Casarte/ Leader/RRS.com/Aqua	Asia
	Fisher and Paykel	Global
BSH Hausgeräte GmbH (D)	Bosch	Global
	Siemens	Global
	Gaggenau	Europe/Global
	Neff	Europe/Global
	Thermador	US
	Balay/Coldex/ Junker	Spain-Europe
	Constructa/ Pitsos	Germany/Greece
	Profilo	Turkey

Source: *Groups' websites*

Group	Brands	Geographic Area
Arcelik Group (TU)	Arçelik	
	Beko	Global
	Grundig, Dawlance, Altus,	
	Blomberg, Arctic, Defy, Leisure,	
	Arstil, Elektra Bregenz and Flavel	
Electrolux Group (S)	Electrolux	Global
	AEG	Europe/Germany
	Arthur Martin/ Atlas/ Castor	Country specific
	Corberó/Elektra	Country specific
	Kelvinator	Oceania/Global
	Frigidaire	US/Global
	Zanussi/Rex-Electrolux	Italy-Europe
LG Group (K)	LG	Global
Samsung Group (K)	Samsung Group	Global

Source: *Groups' websites*

Ultimately, Table X shows the latest repartition of single Group's market shares within the European Market, for a sample sector of WMs and WDs. As shown by the data, for the WMs and WDs segments, the market seems to be increasingly concentrated with the first seven groups accounting for about 85,5% of the European production of Home domestic appliances.

Table X: Market share recorded by the main European Home appliance producers, WM 2019

Group	2019 WM
Whirlpool Group (US)	18.8
Haier Group (C)*	12.3
BSH Hausgeräte GmbH (D)	14.5
LG Group (K)	10.9
Samsung Group (K)	11.4
Arcelik Group (TU)	6.8
Electrolux Group (S)	10.8
Total by main Grps	85.5
Others	14.5
Total	100

Source: WM MIT

Assuming also for the other segments a similar distribution, or at least not too far from the WMs data, it might be concluded that the European Home Appliance Industry has reached its maturity already from the mid-80s and 90s.

As a matter of fact, the European Home Appliance Market is displaying overall a high concentration with few Global Corporations competing between themselves, utilizing cutting edge technologies, large plants, in a market with a low rate of demand growth and with increasing quality standards - as it will be seen in the next chapter - .

2.4.2.2 Competitive Strategies and Dynamics

If the first fifty years of the Industry evolution were characterized by Brands' choices of whether competing at Global, European or National level, the observed emergent strategy was slightly different over the considered period.

Indeed, as Corporations' dimensions have furtherly increased, all of the Groups competing in the European market display a diversified and balanced offer in the their respective "Brands' portfolio", encompassing either Global, European and National brands, along with "niche" and "mass market" brands.

Hence, it might be said that in order to meet consumers' needs, different from market to market, Global corporations went through their acquisitions processes choosing from time to time the acquired brand in order to create a diversified and balanced portfolio, which could allow the Group to carry out its strategy based on a multi-brand and multi-product approach.

Moreover, it has been noticed the tendency of some Corporations to reorganize for a better rationalization their Brands offer. It is the case, for instance, of Indesit, which with the Hotpoint-brand acquisition in 2001, and after a redefinition of the Brand naming Ariston to Hotpoint-Ariston, proceeded in 2011 with the definitive elimination of the former Ariston Brand.

However, the latter case was not exempt from risks and critics, as brands elimination requires cautious decisions and clear strategies.

Other global players decided instead, by purchasing national brands, to continue displaying their main brand logo, in combination with minor or national brands. It is the case for instance of Electrolux, maintaining for REX and AEG their country-specific propositions.

Furthermore, an even more important phenomena which has interested the European Home Appliance Industry is delocalization. In a more than ever competitive environment, as only the one of a mature industry could be, it is important to decrease production costs and improve factory efficiency. These goals were reached first by building up production

capacity and maximizing plants utilization and, secondly, in many cases by moving production into low labour cost countries.

2.4.2.3 Competition Dynamics in the Sector

The European integration process has undoubtedly led the industry towards a higher concentration within the European zone, reducing differences between countries and therefore chances for Brands for a horizontal differentiation.

In addition, the further European expansion towards East European countries has increased the chances for a market demand growth, despite different product requirements.

Nonetheless, overall, in continuity with what it has been seen in the previous period, the market presents the characteristics of an oligopoly, characterized by the lack of a proper oligopolistic coordination, due to a high competition mostly within the same segments.

Furthermore, the already low rate of growth of demand was worsened by the economic instability over the period 2010-2015, which meant consumer anxiety, delayed demand and excessive supply, constraining manufacturers to aggressive price policies, which ultimately, since within the sector demand to price is quite inelastic, ended up to erode profit margins. In this context, factory strategy became the defining element of winning or losing.

Ultimately, the 21st century has been characterized by the increasing presence within the European market of Far East Chinese and South Koreans competitors, that were not even present in the previous period, whereas national Corporations have lost the Italian ownership in favor of Global Brands. The former phenomena, was owed mainly to the entrance of countries such as China in the WTO in 2001 and to a high spending power,

which led Asian corporations to progressively buy minor national brands in order to enter the targeted markets.

Concerning the Italian brand loss of ownership, here it is important to emphasize that despite the choice of focusing on the Italian national market, which was carried out over the years 90s, seemed to pay off more comparing to other Brands' choices, at the end it turned out be dangerous for two main reasons.

First, Italian companies did not have high market shares comparing to other European groups. In addition, the high competitive pression within the European market, strongly reduced profit margins and ultimately, the new wave of acquisitions which took place over the period 2008 to 2018, put these companies into troubles exposing them to the risk of being purchased by foreign global corporations.

The second reason is due to the globalization advantages, which pushed Asian and American competitors to enter the European market buying the already weakened firms.

2.5 PATTERNS OF PRODUCT LIFE, INDUSTRY AND INNOVATION

So far the discussion has verted separately first on Product Life Cycle Theory, then on Innovation. In addition, in the second chapter, it has been introduced into the analysis the Industry Life Cycle topic and, along with it, the main criteria to assess its evolutionary stage.

In this paragraph, starting from an innovation perspective, it will be analyzed how all of these themes are in reality extremely interrelated and how innovation ultimately might shape even the industry landscape and the distribution of firms, giving birth, as in the Italian case, to industrial districts, where innovation functions as an accelerator of industry development, begetting ulterior innovation.

It has already been introduced in the previous chapter, the role of knowledge diffusion and innovation in shaping a product life cycle curve.

Radical innovation determines the birth of a new product and the whole path of a product evolution over the four stages of its Life cycle is determined by the way innovation and knowledge are addressed. Even the succession between Maturity and eventually the Decline stage follow the same rule. In particular, the Decline stage, when innovation is properly managed, might be reached even in a very late future, thanks to a series of product life cycles extensions, which through incremental innovations, could allow for product and process improvements.

The aspect of product life cycle revivals is particularly important, especially in industries characterized by a high pace of technological advancement, such as the Home Appliance Industry, where it has been recorded over the years an increasing tendency to have compressed Product Life Cycles.

In the first paragraph of this chapter, it has also been discussed the role of innovation and, in broader terms, of knowledge, as one of the forces shaping the Industry Life Cycle.

As a matter of fact, new knowledge in the form of product innovation exerts a main role in a new industry's birth. Knowledge diffusion is also responsible later on for an industry growth, with the affirmation of a dominant product design, the improvement of production techniques through technological advancement, and of the shift from radical product innovation to incremental innovation and to process improvement. And yet, similarly to what happens for the Product Life Cycle, but on a broader scale, knowledge diffusion represents in mature industries also the chance for a rejuvenation of the industry, through ulterior products improvements.

In particular, studies about innovation have led over the years to the awareness that innovation takes place thanks to the net interaction of actors with different competences, capabilities and objectives (Roveda, Vecchiato, 2008, p.6). In addition, because of its systemic nature, innovation takes place at different levels, which are in turn communicating between themselves: national, regional and sectorial. More specifically, local and regional levels have assumed over the years a striking importance, especially in the Italian Home appliance industry development, during the 90s, when innovation was at the base of Italian firms competitive advantage.

Moreover, if on one hand innovations tend to concentrate in specific and limited areas, on the other hand it has been progressively recognized the specific character that technological innovation processes tended to assume in different regions and local areas and the importance of spatial and territorial dimensions in affecting innovation processes (Roveda, Vecchiato, 2008, p.6). In this sense, industrial districts might be considered the

most relevant example of the above described situation. As a matter of fact, according to the definition provided by C. Roveda and R. Vecchiato, Industrial districts are made of an ensemble of enterprises and correlated institutions that are operating, in condition of geographic proximity, in a certain industrial sector of business.

Taking as a reference the Competitive Advantage of Nation by Porter, 1990, it is possible to identify four factors affecting the competitive advantage of a nation: Factor conditions, Demand conditions, Related and supporting industries and Rivalry (Porter, 1990). In this frame, the importance of industrial districts is given by their role in supporting and enforcing two main elements of the Competitive Diamond (Porter, 1990) and in particular:

- rivalry: industrial districts favored a direct competition between firms, especially for what concerns differentiation strategies and continuous product innovation,
- the growth of correlated and supporting industries, since the same enterprises spontaneously cooperate for the development of external economies, which tend to transform the industry itself and constitute an essential factor for differentiation and innovation purposes (Beccattini e Rullani, 1993; Porter 1998).

Concerning the considerations above, two points have to be underlined. First, the dual role of innovation in shaping industrial districts, which constituted the base for the Italian Home Appliance Industry development and, by their own, played a fundamental role in fostering further innovation.

And second, despite Italian Industry could count over the years on all of the elements of Porter's Competitive Diamond, Italy missed the opportunity to develop a proper Competitive Advantage within the European and Global Home Appliance Industry.

Referring to Porter's Competitive Diamond model in its Competitive Advantage of Nations (1990), Italy could respectively count on: a) Factors availability, owed to low labour costs and an enhanced entrepreneurial spirit during the 50s and 60s, b) High Demand, due to the growth of the European market first and then of the internal one, which led Italian enterprises to heavily invest on capacity building over the 70s, and ultimately the development of supporting industries and a high rivalry, which pushed Italian enterprises to innovate further. Thus, at the end of the 80s the Italian Home Appliance Industry had already acquired most of the elements necessary to the development of a nation competitive advantage and in the 90s, with the occurrence of the last stage driven by innovation, all of these factors were enforcing one another through virtuous interactions (Balloni, Cucculelli, Iacobucci, 1999, p.96).

Despite all, Italian firms were not able to assume a leading role in this industry neither at European nor at Global level. Foreign Corporations managed to build since the beginning a better Brand Reputation and to effectively handle distribution channels, despite the (precarious) Italian cost advantage in production. This made more difficult for Italian companies to enter those markets (Balloni, Cucculelli, Iacobucci, 1999, p.96).

Last, Italian firms, with the outset of maturity stage have been mostly acquired by European and Global competitors, which set within the country most of their Headquarters, investing in activities such as Marketing and Research and Development. In this sense, it might be concluded that the Italian Home Appliance Industry displays some anomalies comparing to Porter's model. According to the latter, the success of a Nation is associated to the presence on the territory of the major Global Corporations. The anomaly is however overcome, according to the Author, by the fact that focus is not about ownership nationality, but about the autonomy degree of the controlled company.

3. HAEIR EUROPE AND THE CASE OF A NEW PRODUCT DEVELOPMENT

3.1 THE GROUP



Based in Brugherio (MB), the Group Candy-Hoover, acquired in 2019 by Haier Group for 475 million euros, is one of the European leaders in the sector of home appliances.

For over twenty years, the Candy-Hoover's products have been known by consumers for their ease of use and for improving their quality of life, along with a high degree of innovativeness. Candy-Hoover Group has a long history of success, due to its capability to develop a diversified portfolio, including brands with different proposals and values, providing its customers with a complete offer of large and small appliances, both free standing and built-in, ranging from the sectors of cooking and refrigeration, passing through washing till small appliances for the and the cleaning of the home.

Throughout the years, Candy has been able to export the Italian style all over the world, entering first the European, then the Middle East, the Asian and Latin American markets. The Group's products are distributed on the markets with three main international brands Candy, Hoover, Haier and other national Brands such as Zerowatt, Rosieres, Iberna, Baumatic, Vyatka, Otsein, Jinling, Susler (Candy Group Financial Statements, 2017).

3.1.1 History of the three main brands: Candy, Hoover and Haier

Based in Monza, in 1945, the Officine Meccaniche Eden Fumagalli, manufacturers of precision tools for machineries, created the first Italian washing machine named "Model 50". The model was then presented to the public at the Milan Fair in 1946. In the same year, the father Eden Fumagalli along with his three sons Niso, Enzo, Peppino transformed and reorganized the production, giving birth to Candy.

However, it was when the son Enzo, sent from the United States the sketches and descriptions of the electric washing machine - which was already broadly known among American families - that the activity took off.

Afterwards, the sons Niso and Peppino took the decision to divide their responsibilities: Niso, started the industrial activity with his father, focusing more on household appliances, while Peppino, the third brother, dedicated his work to building the administrative and management structure of an industry destined to grow.

In 1958, was created Candy Automatic, which is considered the first modern, fully automatic washing machine, displaying as for the modern washing machines a central glass door, suspensions and horizontal basket. This model became the reference for the European standards still in use (<http://www.candy-group.com/en/group/innovations>).

In 1966, it was the turn for the first automatic dishwasher launched by the company, named Stipomatic, with two compartments, accompanied by the launch of an ulterior model of washing machine: the Superautomatic. In the same year, the first compact washing machine, named Candy Misura, was produced. This washing machine paved the way for the Aquamatic series (<http://www.candy-group.com/en/group/innovations>).

In 1974, the Candy Tempo and Variant washing machines are the first providing consumers the possibility to adapt the water temperature to the different types of fabrics

or to add an additional washing time - up to 30 minutes - for heavily soiled fabrics (<http://www.candy-group.com/en/group/innovations>).

Furthermore, after gaining an important experience between the years 50s and 70s in the washing segment, the Group's strategy aimed at diversifying the product lines and expanding the existing ranges. This rapid growth was achieved also through acquisitions. The first acquisitions which took place in 1971, when a new brand of Kelvinator Italia was acquired and an agreement with Kelvinator USA, was defined to produce and market household appliances under this brand worldwide allowed the company to bring in 1978 on the Italian market the first No-Frost Refrigerators made with cold technology to avoid the formation of frost.

Meanwhile, another acquisition took place in 1973 when the range of large appliances was expanded with an historical brand in cooking: La Sovrana di Sorbolo (Parma), a historic brand in cooking. In 1980 Candy went on with the purchasing of Kelvinator UK and its manufacturing site in England.

As a result, also of the several acquisitions which took place in those years, in 1980 the first Trio was born: dishwasher, oven and hob in one appliance and in standard dimensions, which still remains unique.

In the years 1982 and 1984 Candy presented respectively the first 5 burner kitchen in 60 cm, which had one additional burner comparing to the others present on the market, and Candy Cuocirapido, which is the first Italian designed microwave.

Later on, a new wave of acquisitions led into the Group in 1985, Zerowatt, a manufacturer of washing machines and dryers and Gasfire, a well-established brand in cooking, in particular for built-in; and ultimately in 1987 Rosières, a historic brand founded in 1860, leader in France in cooking and collection.

In the same years, in 1986, was created Candy Alisé, the first washer dryer in Europe with internal condenser, and in 1989 Candy became specialized in the narrow washing machine segment with the launch "Space-saving" models, such as Candy Holiday which is the first 33 cm washing machine or in the same year the first washer dryer 44 cm deep (<http://www.candy-group.com/en/group/innovations>).

Afterwards, in 1992 and 1993 two more companies joined Candy Group: Mayc-Otsein a Spanish company leader in top-loading washing machines and Iberna, an Italian company specialized in refrigeration.

The acquisitions went on throughout the '90s with the purchase, from Maytag (in 1995), of Hoover European Appliances, including the exclusive possibility to use the brand for Europe, the former Soviet Union and the Mediterranean basin.

The latter, Hoover, is a leader in floor-care sector, offering a broad range of small and large appliances that are widely known for their high levels of innovativeness, technology, performances and attention to details. The technical features of its products allow the company to enjoy a strong position in the mid-high end of the market for large appliances, both free-standing and built in.

The company was founded in Ohio (USA) in 1908, the year in which it patented the first vacuum cleaner.

It was, however, in 1919 with Hoover Ltd, that European Operations started in London. The first Hoover plant was then opened in Perivale, where the production of carpet cleaners started off. Soon Hoover got to conquer a solid leadership in the floor-care segment. Few years later, in 1937, Hoover Ltd, was acquired by the American parent company and in 1948, the company launched the first washing machines, which allowed Hoover to establish itself on the British market also as a brand of large appliances.

Furtherly, in the 1980s the international Hoover businesses went through a period of ownership changes, with their acquisition in 1985 by the Chicago Pacific Corp., which was bought itself by Maytag in 1989. This way, in 1993, Hoover European Appliances Group, which in 1995 became part of Candy Group, was born.

A further expansion of Candy Group's production base and range of national brands was undergone in 2005 with the acquisition of Vesta, in Kirov, Russia, which produced washing machines for the brand Vyatka. The plant was completely renovated for production destined to the Russian market.

In 2006 Candy acquired the Jinling Group, along with research and development resources, industrial capacities and the sales network. Furthermore, an ulterior expansion was carried out towards Turkey, with the acquisition of Süssler brand, one of the market leaders in Turkey. The brand, founded in 1947 and based in Eskişehir, has become one of the Group's production centers for kitchens, hobs and ovens.

An ulterior expansion took place at the beginning 2013, with the acquisition of the English Baumatic, a well-known household appliance brand, specialized in built-in appliances, wine cellars and free-standing kitchens.

Furthermore, in 2017 a collaboration agreement was started with another Chinese company Hefei Meiling Co. Ltd, which is one of the leading companies in the Chinese large appliance market, characterized by a well-developed distribution and established net of services. Meiling manufacturers and markets products in the refrigeration sector, while the joint venture has been created for handling the marketing and distribution of Candy, Jinling and Meiling branded washing machines on the Chinese market and it symbolizes the beginning of a strategic collaboration in the refrigeration field.

Strengthened by its long history permeated by successes and thanks to a deep experience in the sector, today Candy Group continues its path by creating pioneering products capable of combining innovation and ease of use to meet the needs of consumers and improve their quality of life.

In January 8, 2019 the Group has been purchased by one of the market biggest players in the production of white goods: Chinese Group Qingdao Haier. Therefore, Candy-Hoover has now become a subsidiary of Qindgao Haier, and it is now led by the CEO Yannick Fierling.

The giant, with the acquisition of brands such as Candy, Hoover, Rosieres, Ge Appliances and Fisher and Paykel has aimed at creating a brand portfolio which encompasses the entire domestic appliances market, from ultra-high premium to more affordable ranges, always putting at the center quality and user experience. Therefore, the acquisition aims at exploiting at best the high complementarity of Haier with the other brands and products. In particular, the collaboration with the Candy Hoover Group, will help Haier to enter the European market, allowing the giant to carry out its global brand strategy exploiting at the same time Candy's knowledge and capabilities to implement to establish itself in the region.

3.1.2 Candy-Hoover's Productive Plants

Candy's strategy for dislocating the production is to place it as closer as possible to major basins of consumption, evaluating from time to time the best industrial solution. The latter is defined according to an ensemble of factors which must be carefully assessed such as the markets, industrial and employment scenarios, and logistics. As already mentioned, the production is based on a network of different plants dislocated between Italy, France,

Russia, China and Turkey with a balanced presence based on the distribution and marketing of the products.

The Italian Plant, in Brugherio (Monza Brianza), was inaugurated in 1961 and it produces mainly front front-loading washing machines and uses the innovations of factory 4.0, together with systems for the continuous improvement as the WCM.

Another plant where production takes place is Jinling, located in the Guandong Region, in China, which produces front-loading "European" type washing machines, completely identical to those leaving the Brugherio site and traditional "Asian" vertical axis models. Furthermore, the Groups's main production center for built-in kitchens, hobs and built-in ovens is in Eskişehir (Turkey). Near the latter, the Renta plant, producing dryers, has been operating since the end of 2009, with a production capacity of 600,000 units per year. Also in Turkey, it is based a second production unit, which was inaugurated in 2018, and it is specialized in the production of intelligent dishwashers.

Front-loading washing machines with the Candy and Hoover brands are instead produced in Kirov (Russia), while in France, in Bourges, the production of built-in appliances for cooking and kitchens with the Rosières brand, which is a leader in the high-end market, takes place.

3.1.3 Economic Figures

After having heavily invested on innovation, between years 2015 and 2016, Candy Hoover turnover increased by 10%, from 1.025 to 1.035 billion euro.

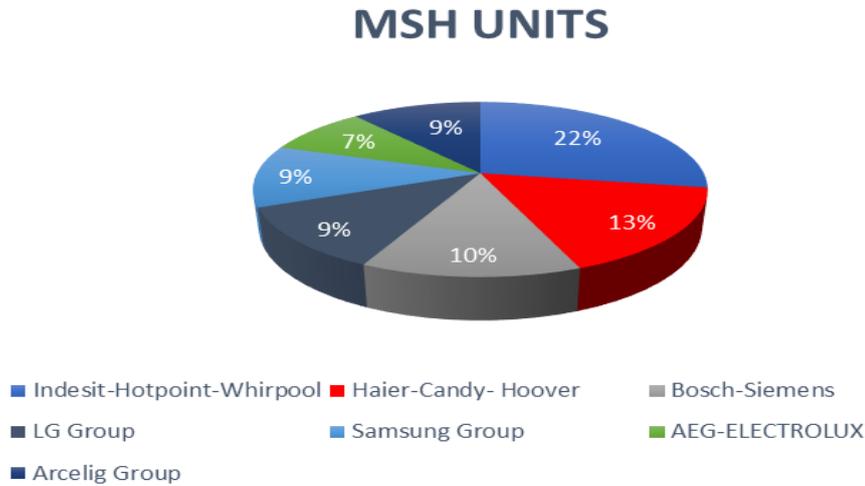
Moreover, in 2017 Candy-Hoover achieved consolidated revenues of 1.148 billion euros, with a further increase of 14%, thanks to the focus on brands and product innovation, being for the second consecutive year, the Group recording the highest growth in the European home appliance market.

The Group's turnover is mostly recorded within the European Union, with the U.K. (21%), France (18%), Italy (17%), the Iberian Peninsula (6.5%) and Germany (4.5%) playing a major role together with Russia, which is currently growing strongly (WM, MIT V3, Candy-Hoover slides, 2019).

Between 2017-2019, further investments were made in order to support innovation and growth and to enhance communication and marketing activities. As a matter of fact, the latter, along with brand innovation, is considered an essential asset for achieving and intercepting the preferences of the different consumers segments, allowing to propose the right product and brand in accordance with their users' needs.

In the same year, prior to the Candy Group acquisition, Haier's global turnover reached 39.1 billion of euro, recording more than double than 9 years earlier. Furthermore, according to the data of Euromonitor International, in years 2016 and 2017 Haier recorded a market share of 15,4% m/s for two years in a row, while in 2018 the aggregated volumes of Haier and Candy reached 22.7% m/s on freestanding refrigeration appliances and 19.8% in home laundry appliances.

3.1.3 European Market Share in Units



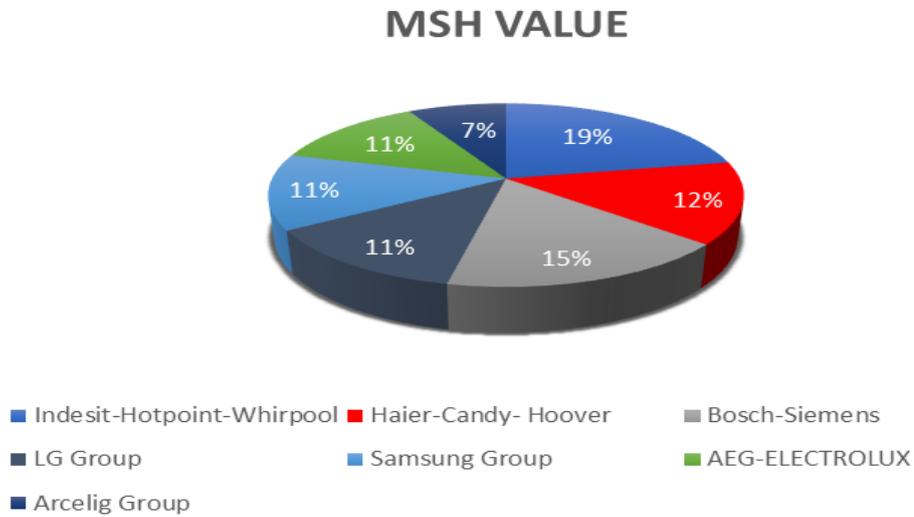
Source: Elaboration on data contained in WM, MIT V3, pag. 2, slides, Candy Group

For what concerns the Washing Machines European market, in 2019, after the acquisition of Candy, the Group recorded in the first quarter, a turnover of about 2 billion euro, selling almost 6 million units. Overall, the laundry market showed in the first part of the year a positive trend on bigger capacity washing machines, on washer dryers and on top loaders. The demand for slim washing machines has instead decreased after long time.

Furthermore, comparing to its main competitors, Haier Group, with 13.3% of m/s for sold units, is the second biggest Group in the competitive arena, second only to Whirlpool, which in 2019, recorded about 22.1% m/s. All other competitors, such as BSH, LG, Samsung and Electrolux Groups, recorded less.

Moreover, in terms of sales value Haier is the third Group in the competitive landscape with a 12,3% m/s, after Whirlpool with 18,8% m/s and BSH Group which recorded 14,5% m/s in year 2019.

3.1.3.1 European Market Share in Value

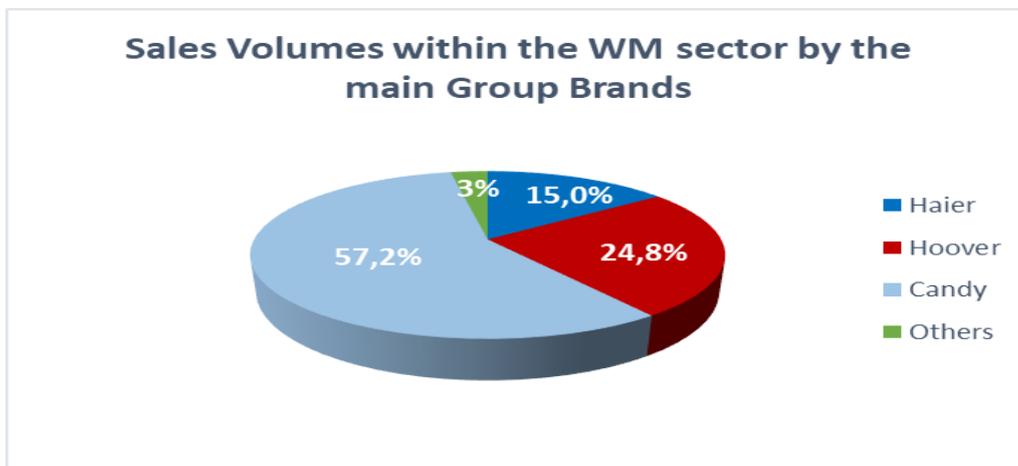


Source: Elaboration on data contained in WM, MIT V3, p. 2, slides, Candy Group

Furthermore, when assessing the relationship between m/s in terms of sold units and in terms of value, over time, the two values seems to have increased proportionally.

In particular, conducting a separate assessment of the three respective market shares of the main brands composing the group: Candy Hoover and Haier, it is possible to achieve the below results.

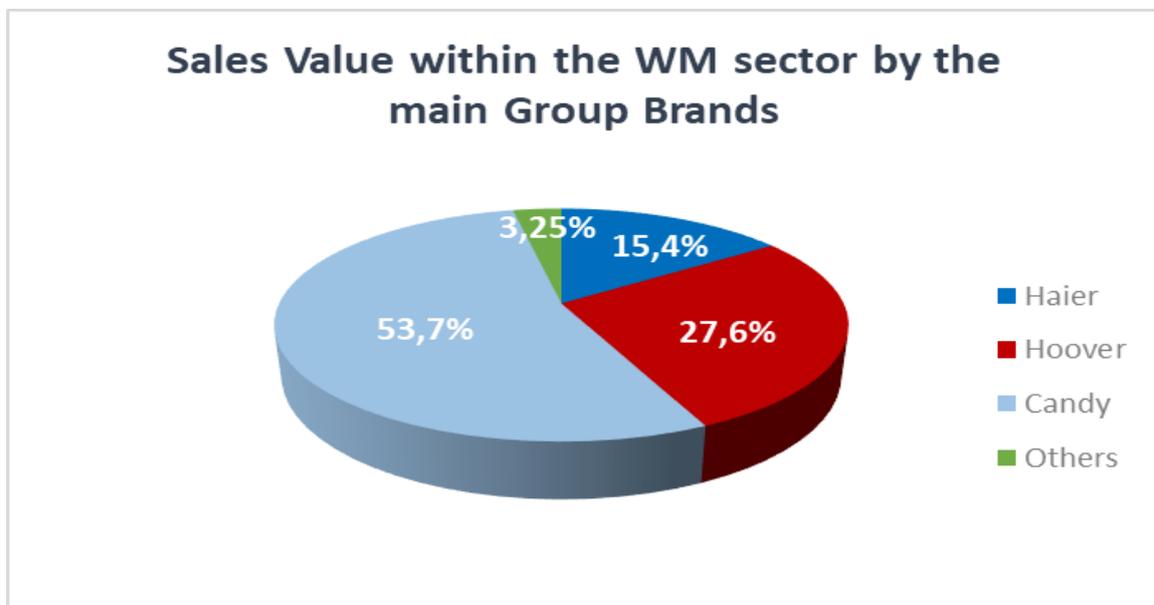
Figure 3.1.3.2 Sales volumes within the WM sector by the main Groups' brands



Source: Elaboration on data contained in WM, MIT V3, p. 3, slides, Candy Group

Having as its core business the sector of WMs and WDs, in 2019 Candy has registered a 7,6% volume market share and a 6,6% value market share in Europe. The brand has the highest market share within the Group, with about the 57,1% of sales in WM/WD sector and indeed, a proportionally high value market share about 53,7% of the revenues generated by the Group in the same sector. Nonetheless, when crossing the two data of volumes and value scored at European level, the negative difference between the two values - 7,6% and 6,6% - well emphasizes how the brand places its products at a lower price comparing to the market average. Overall, the negative value is justified, as it will be seen later on in the customer target segmentation analysis, by the lower positioning of Candy as a brand, which tends to be focused within the competitive landscape mostly on price (Value).

Figure 3.1.3.3 Sales Value within the WM sector by the main Group's brands



Source: Elaboration on data contained in WM, MIT V3, p. 3, slides, Candy Group

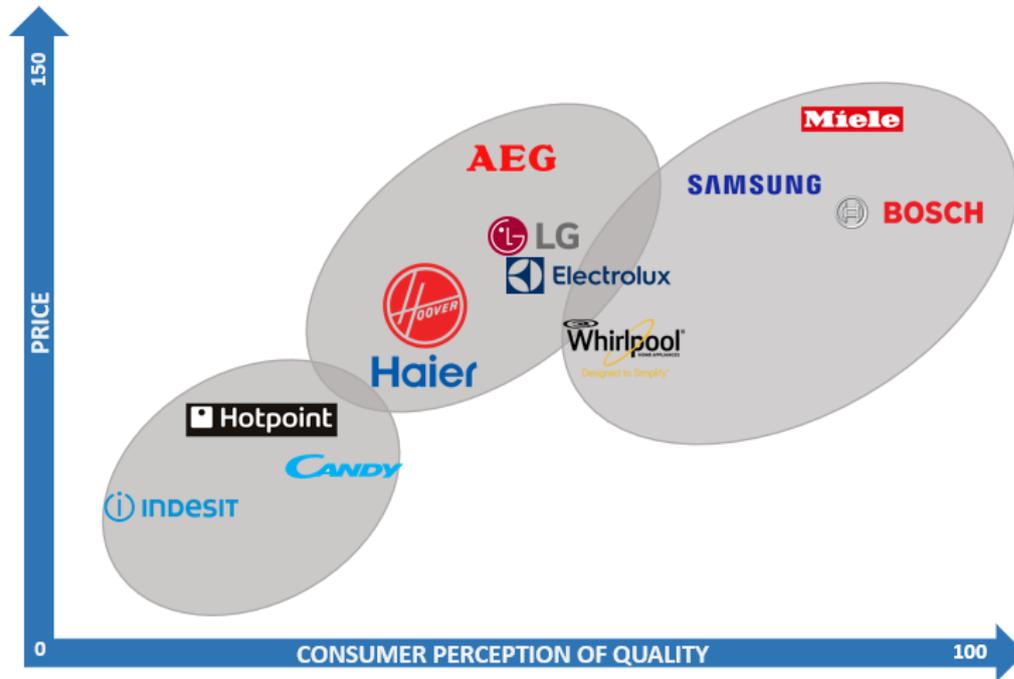
With a volume market share of 3,3% in Europe, Hoover, holds the 24,8% of sales of the group in the WM/WD sector, and the value market share of 3,4% in Europe, generating for the sector the 27,6% of the Group's total revenues. Taking into consideration the two data about Msh volume - 3,3% - and Msh value - 3,4% -, it can be concluded that Hoover is applying a premium price, despite being sales volumes inferior to the brand Candy, for which WMs and WDs represent the brand's core business. As a matter of fact, as already explained in the Group history, Hoover is actually leader in another business sector of home appliances, the one of floor-care.

The last arrived in the Group, Haier Europe, owns about the 2% of volume market share and the 1,9% of value market share in Europe for the WM/WDs sector. The brand generates the 15% of sales volumes and the 15,4% of revenues. Despite having entered the market only recently, the Brand displays satisfactory sales volumes, but still low comparing to the other two brands belonging to the Group, probably due to the lack of customers' brand awareness towards Haier's offer in the WMs/WMs sector.

In particular, comparing the two values referred to Msh Volume and Msh Value it has to be noticed the negative difference between the two values, which means in Europe Haier products are sold at moment below their value. Nonetheless, still Haier washing machines are sold at a higher price level comparing to Candy and Hoover washing machines which is due to a higher positioning of the brand.

3.1.4 Competition analysis

Figure 3.1.4 Competition Map



As already analyzed in chapter 2, the Home Appliance Industry is a mature industry, characterized by a quite high level of concentration, with few main competitors, mostly Groups, which have been forming over the years, especially starting from the 80's.

Presently, the six major players operating in the European market are: Whirlpool Group, which includes the three main brands: Indesit, Hotpoint and Whirlpool; Haier Group, including the three major brands Candy, Hoover and Haier; BSH Group including Bosch and Siemens; LG Group; Samsung Group and ultimately Electrolux Group, formed by AEG and Electrolux.

The above competition map has been constructed by allocating on the horizontal axis consumers' perception of quality and, on the vertical axis, the price index. Data about the former variable have been collected using the survey tool, with a number of n=45 observations. In particular, it was asked to the interviewees to classify, and therefore to assign a score, to each of the considered brands for the variable "perception of quality

associated to the brand". Whereas, the latter variable has been calculated on the basis of the relative market share value, obtained by the ratio between market share value and market share volumes.

At the bottom left of the graph, it is possible to encounter three brands: Indesit, Hotpoint and Candy, belonging to the first cluster, characterized by a value consistent with the low price and a moderate level of perceived quality. Among the three, Candy is the best scoring brand when it comes to perceived quality scoring 25 over 100.

The second identified cluster, containing brands such as Haier, Hoover, Electrolux, LG and AEG is instead characterized by high-medium prices and higher level of perceived quality ($30 < x < 50$). Among them, on average, AEG seems to be the most expensive, Electrolux is the brand within the group with the highest level of perceived quality, whilst Haier displays slightly cheaper prices. In particular, Haier's lower prices might be due to the newness of the brand, that has only recently entered the European market in the washing sector, and which might have pushed the brand to initially apply a different price policy during the market entry phase. As a matter of fact, according to the same data, overall, Haier in the last year is the brand having experienced among the considered competitors, and within the European market, the highest increase in prices.

Ultimately, the third and last cluster identified, encompasses brands such as Bosch, Miele, Samsung and Whirlpool, characterized by an even higher price and consumers' perception of quality. Among them, Miele, is the one applying the highest premium price, whilst Bosch, despite applying lower prices comparing to Miele and Samsung, it is the brand to which consumers recognized the highest level of quality scoring 88,5 over 100.

3.1.5 Haier Group: Mission, Vision and Values

3.1.5.1 Candy-Hoover

Mission

The Group's mission as stated by its founder Beppe Fumagalli, "is to improve daily life with home solutions that can surprise and amaze consumers all over the world" (<http://www.candy-group.com/en/group/mission-values>).

Vision

"Commitment, innovation and concreteness. A way of doing business which focuses on people and their needs. It is the inspiration that has made the Group great and the road on which to move to continue to be the global reference point for those looking for innovative solutions that make it even more comfortable, easy and pleasant to take care of the house, its cleanliness and one's own Welfare" (<http://www.candy-group.com/en/group/mission-values>). These concepts become concrete in the group's vision:

- "The people who work in Candy Group are proud to change the world with their work;
- Candy Group is a leader in understanding consumers and their needs in order to have the best experience in the product and service;
- With our brands we create solutions for all homes, generating ever-increasing value for all stakeholders." (<http://www.candy-group.com/en/group/mission-values>)

Values

The values which drive the Group's operations are:

- “*Rapid innovation* and *quality* aimed at continually improving the performance of products and services, with particular attention to the constant evolution of consumer needs;
- *respect for all individuals* whether they are consumers, employees, suppliers or partners;
- *design*, to achieve a harmonious and distinctive look focused on the functionality of the product;
- *be customer centric* aligning the products and services to the consumer's expectations. A distinctive trait for an avant-garde style and approach;
- *Italian spirit*: creativity, sensitivity for Italian culture, taste for design and cuisine.” (<http://www.candy-group.com/en/group/mission-values>).

In particular, Quality is referred to in Candy Group Quality Policy as the center of what Candy does. Therefore, all the group’s activities have always been oriented towards Quality.

Furthermore, improving Quality both in the offices in the product development phases, in the industrial sites in the production phase and the commercial network and customer care service, helps to meet also another goal stated in the corporate mission, which is Customer satisfaction.

However, Candy does not only aim at providing customers with high-performance and durable products, but it wants to support its offer with a series of services that enhance each function of use, in order to maximize the final customer’s experience.

These goals, persistently pursued, allow the company to position itself among the best players on the market today. To ensure the high-quality standards Candy aims to maintain,

the Group applies an effective management system to each technical and production reality compliant with the most recent version of the ISO 9001 standard.

Other two values which inspire Candy Groups' operations are Innovation and Design.

As a matter of fact, in order to keep consumers stimulated and to meet the challenges coming from the market, the company must be able to offer innovative products, which merge the most current technology with high performances, ease of use and respect for the environment. Candy's goal is also to earn and maintain consumers' trust.

Another important element of Candy's proposition is design, which is considered by the company as a basic element for the success of an appliance, since its emotional message is a powerful sales argument.

However, beauty cannot prescind from functionality. Hence, Candy Group works for functional beauty, by bending design to the function which the product was conceived and built for.

The design, defined according to the market requirements and the target audience, is a strong element of differentiation, which is immediately noticeable in the entire range.

3.1.5.2 Haier's Values

Since its foundation in 1984 in Qindgao, Haier's efforts were geared at building high quality and reliable products. These goals were supported by strong Values such as Innovation, which has been in the Brand's DNA since the inception; the Design, to meet the expectations of the most demanding consumers who want to meet the need for stylish product with the one of functionality; and ultimately Quality, which represents for Haier, a basic element to earn consumers' trust.

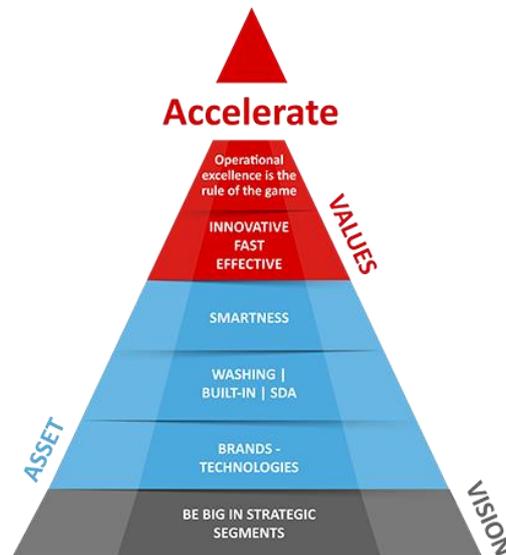
3.1.6 Candy- Hoover Strategy

Candy's industrial plan is developed in accordance with to the Group's vision, trying to identify and consolidate its leadership in the strategic sectors, which are those characterized by models with large loading capacities, slim formats, washer-dryers, top loading-appliances, where the company can provide a considerable added value for its products (<http://www.candy-group.com/en/group/strategy>).

Technological innovation, especially connectivity, and the brand positioning of Candy and Hoover are elements found throughout the development plan, whereas the three pillars - washing, built-in domestic and kitchen appliances and small appliance - are the focus areas which the business is based on (<http://www.candy-group.com/en/group/strategy>).

Figure 3.1.6 Pyramid Strategy

(<http://www.candy-group.com/en/group/strategy>)



In particular, in the washing sector Candy has been a leader since the invention of the first Italian washing machine, which took place in 1945 until today with its offer characterized by a wide variety of Wi-Fi connected domestic appliances (<http://www.candy->

group.com/en/group/strategy). The constant innovations have focused especially on automation, design and functionality, improving the performance of the products in order to provide an improved efficiency and lower energy consumption in all the product lines dedicated to washing (<http://www.candy-group.com/en/group/strategy>).

Another segment which sees Candy-Hoover combining the strong values of the Italian culinary tradition with advanced performances is the one of Built-in Cookers. Here the innovative, functional design and the application of new technologies, especially those associated with connectivity, allows a perfect integration between domestic appliances and the kitchen (<http://www.candy-group.com/en/group/strategy>).

Also in the segment of Small Domestic Appliances, Hoover represents the second largest brand in Europe. Since the invention of its and very first vacuum cleaner, the brand has remarkably developed its know-how, becoming a leader in a very wide range of products for floor care , varying from carpet sweepers, vacuum cleaners, floor cleaners to steam products; and debuting in 2010, in the ironing system segment. Furthermore in the age of smartphones and “always on connections” Hoover has had the deserve to be able to anticipate the future standards by launching a range of products able to be operated and managed remotely through the use of a Smartphone App “Hoover Wizard App”.

In the cooling sector the Group aims at developing smart appliances for storing the food in the most effective way as possible, by establishing new standards, finding simple solutions for every kitchen requirement and through a fine design, able to satisfy any request and to adapt to any style.

3.1.7 Swot Analysis

Figura 3.1.7 Swot Analysis



Basing its strategy on a multi-brand and multi-product approach the Group aims at meeting a broad variety of customers' needs, proposing an offer which is as diversified as the consumers' needs are. Therefore, the first strength which has to be mentioned is the capability of Candy Hoover Group to create a diversified portfolio, including brands with different proposals and values, providing its customers with a complete offer of large and small home appliances, both free standing and built-in. The diversified offer of products and brands also allows to correctly address the single challenges arising from specific national markets, which are approached differently according to local customer's characteristics.

In particular, the group is holding the market leadership in specific sectors such as the one of slim washing machines, while market share has been increasing in the segments

of Tumble Dryers, Washer Dryers, Top Loaders and in the greater capacity washing machines.

Furthermore, the Italian brand Candy is associated in consumers' mind with tradition, creativity, sensitivity for Italian culture and taste for design and these values are broadly recognized. Therefore, this is another strength of the Group's offer.

Another element which differentiates the Group, especially Hoover and the new brand Haier, is innovation, which together with the appliances' reliability enhances customers' quality of life and wellbeing, for a perfectly comfortable home.

Moreover, another aspect which must be emphasized in the Group's offer is its high percentage - 61% - of market share in connected washing machines, which makes of the Group the leader in the strategic segment of smart appliances.

To continue with, the company enjoys a well-established supply chain and a large production capacity owed to plants scattered throughout Europe and Asia, which allow the Group to efficiently serve the main markets. The large production capacity also allows for a consistent unitary production cost reduction thanks to economies of scale.

Economies of scope are also exploited, since all the activities related to the brands management, communication, and partially Administration and R&D are managed centrally in the Headquarter of Brugherio.

However, few weaknesses should also be considered. First, the decreasing margins in some specific sectors and the stagnating growth of market share in others, such as front loaders washing machines.

Secondly, the group has been facing a declining presence in the middle price band, where competition by other players is higher and in particular Hoover has demonstrated a somewhat weak positioning over the target segments. In addition, difficulties were

encountered in the distribution of some of the Candy-branded premium models such as Bianca. Moreover, the implementation of new technologies such as PLM, which is a software for the Product Life Cycle Management, has only recently taken place and therefore, the implementation is not flawless yet, but rather slightly imperfect. Users need to get use to the new software, system errors - although seldomly - are taking place as well and ultimately as for any other resource, it will require some time before PLM can be efficiently employed consistently and in cooperation with all the other resources, actors and activities involved in the process.

In addition, another aspect which might need future intervention or further consideration is the presence of mostly tacit knowledge, that is the type of knowledge gained from employees' personal experience. The latter is difficult to express and it lacks a proper formalization. An enhancement of processes and procedures formalization would also allow employees to have a better comprehension of their respective roles in the organization and of the downstream and upstream activities which are related with their own.

Last, communication between different departments represents in several organizations and companies one of the major challenges which deserves to be addressed correctly. A better communication allows to take track and to be able to promptly react to any issue in any phase of the product development, launch and commercialization.

Nonetheless, also several opportunities challenge the business. First, there is a growing interest and research by consumers of customized and stylish products, which both represent some of the main features and strengths of the Group's offer.

Secondly, a growing interest by the market in Smart solutions and Artificial Intelligence, might represent for the Group a great chance to furtherly develop and consolidate the leadership in the segment.

Furthermore, the Group could exploit the increasing demand in the middle segment and try to exploit the opportunities arising from the market, by consolidating its presence in the middle-high segment.

Ultimately, few threats are awaiting the business and must be correctly addressed in order to be turned into viable market opportunities.

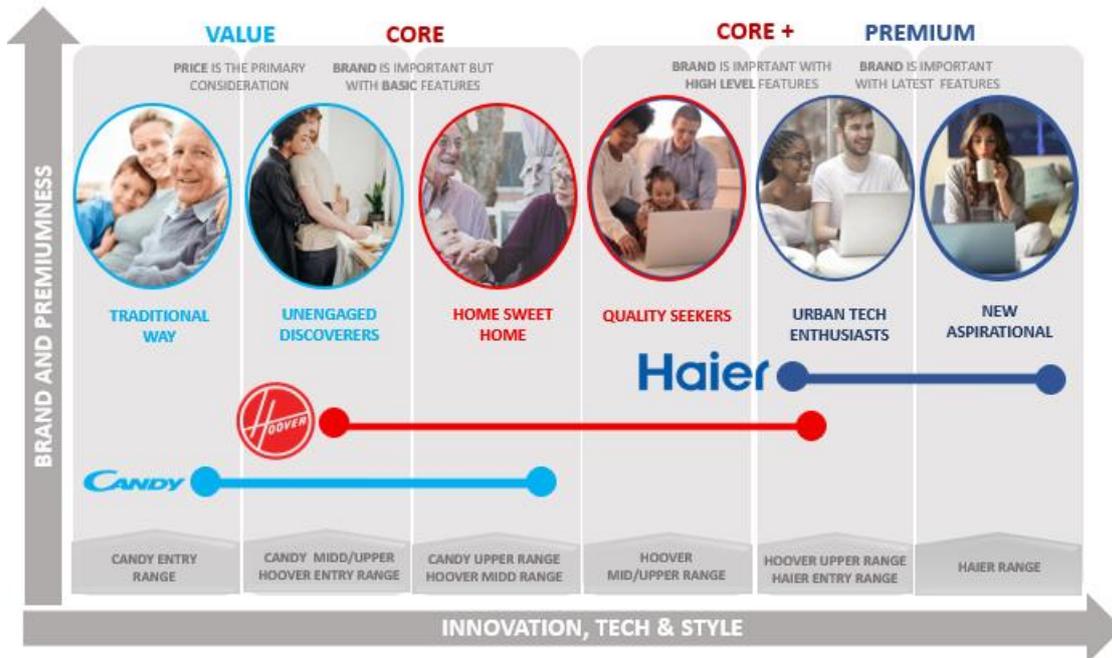
First, as already mentioned, an important threat has proved to be the competition by rivals in the mid-high segment. However, also other segments are vulnerable to the threat of competition, exercised by rivals trying to erode market share, both in the lower segments and in segment such as the one of Smart appliances, where Koreans rivals have a high ratio in product innovation development.

Second, changes in legislation concerning the parameters of attribution of energy label, led the business to a complete renewal of all the product portfolio, with all the related challenges, which will be discussed later on.

Furthermore, owed to the recent acquisition of the Group by Haier, systems and resources will have to integrate and this will require time and ulterior efforts and commitment by all of the involved actors. The process could be a threat, but if properly managed it could turn out to be an opportunity to integrate the two business cultures and foster a new and more inclusive one.

3.1.8 Target Customers Segmentation Analysis

Figure 3.1.8 Main Customer target segments according to Brand



Source: Elaboration on material contained in Candy Group slides

Through a multi-brand and multi-product strategy the Group aims at meeting a broad variety of customers’ needs, proposing an offer which is as diversified as the consumers’ needs are.

In the washing sector, referring to the map, through its three brands, Candy, Hoover and Haier, the Group aims at reaching six different customers target segments: Traditional Way (18%), targeted by Candy; Unengaged Discoverers (15%) and Home Sweet Home (20%) targeted by Candy and Hoover; Quality Seekers (15%), targeted by Hoover and ultimately New Aspirational (18%) and Urban Tech enthusiast (14%) targeted by Haier. The customer segment “Traditional Way” which is the one that Candy aims to reach, is the group with the highest share of elder people and the one with the lowest number of close family members.

They are characterized by low needs, quite pragmatic and traditionalist attitude and a higher average ecological awareness.

Furthermore, they are usually kind of refractory to technology and they are attracted by easier to use devices with less functions and no touchscreens. They perceive house as a refuge and have a low spending power.

Candy products are characterized by a consistent level of comfort and, together with Hoovers' products, they are designed for more traditional consumers too, such quality and highly reliable appliances lovers, particularly appreciating the balanced mix of design and functionality.

Targeted by Candy and Hoover are, therefore, customers segments of "Unengaged Discoverers" and "Home Sweet Home", who consider price as an affecting variable for their decision making, but also expect from the brand to provide a quality level consistent with their expectations. Of the two, the former customer segment "Unengaged Discoverers" is characterized by a lower need for a brand superior positioning and a higher sensitivity towards elements such as style, innovation and employed technologies. This is a fairly mid-young (25-44 years old) group, with a high number of engaged members, which are very likely to have children, to be employed in managerial positions and to live in urban areas.

They are often open to new things and aware that technology is a natural side of life. Nonetheless, they tend to consider their houses an integral part of their everyday life. Mindful about environment, they search for the same attention in major brands.

The latter segment, "Home Sweet Home" presents a superior need for better positioned products with a high degree of perceived premiumness, but with a lower degree of innovation. Moreover, it is one of the oldest groups among the targeted ones and it presents the highest concentration of women. For this group, the house often represents a

referral point in their world and often they are concerned about environment, especially when it comes to energy consumption and wasting.

However, for what concerns technology they often end up seeking simplicity, preferring fewer programs, knobs instead of touch displays and further.

Furthermore, another customer segment targeted by Hoover is the one of Quality Seekers who care about the brand for its high-level features.

The latter is characterized by a high technological and design content and it targets those consumers who are quality and innovation enthusiasts and who follow fashion and design by adopting trendy consumer styles.

Ultimately, Haier is directly targeting two target segments the 'Urban Tech Enthusiast' and 'New Aspirational' segments who considers the brand especially for its latest technology and innovation usage.

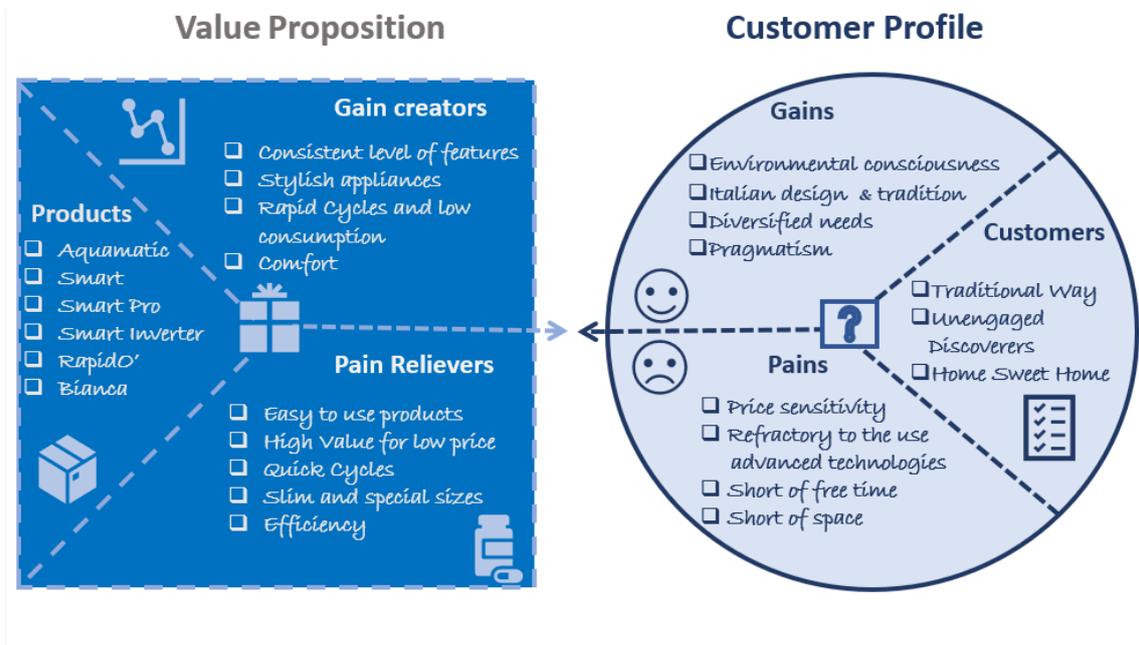
The former group, Urban Tech Enthusiasts (14%) is made up mostly of young adults in age 25-34. This segment is very much high-tech oriented, has no difficulties to manage digital interfaces, remote control, Google, Smartphone Apps and vocal assistants. Individuals belonging to this group employ a noticeable amount of effort into work and career and dedicate a lower portion of their time to their private life. They tend to focus on fashion trends and personal satisfaction. They are seen as influencers and early adopters and have and high spending power.

The latter, New Aspirational, is a quite sophisticated target, curious, explorative and digital, for which novelty is seen as an advantage. A higher attention is geared towards this segment for elements such as style and design, while the choice often gravitates towards premium and quality brands. Their house is often a dynamic and great place to enjoy and live.

3.2 CANDY AND THE CASE OF A PRODUCT INNOVATION: AQUAPET

3.2.1 Value Proposition Canvas: Candy

Figure 03.2.1 Candy Value Proposition Canvas



As already mentioned in the customers segmentation analysis, the target segments pursued by Candy are mainly three: Traditional Way (18%), with quite pragmatic and traditionalist attitude, Unengaged Discoverers (15%), a fairly mid-young target group, and Home Sweet Home (20%) who consider price as an affecting variable for their decision making, but also expect from the brand to provide a quality level consistent with their needs.

Gain Creators

In consideration of the all above mentioned demographic and economic aspects characterizing these three groups, among the Gains, or what would make these customers' needs fulfilled, there would be the ability to get stylish Italian appliances inspired by Italian values and tradition, with either a basic or higher level of features. In addition, customers belonging to these target groups are generally particularly

environmentally conscious and consequently they would look for appliances meeting their expectations and allowing to keep them committed to their values and goals.

More specifically, especially consumers belonging to the segment “Traditional Way”, because of their demographic characteristics, are quite pragmatic and they will be more satisfied with easy to use devices and with less functions.

Instead, customers targeted by Candy flagship products, belonging to the target segments Unengaged Discoverers and Home Sweet Home, are customers who are willing to enjoy their houses, furnished with appliances maintaining a moderate price value, for a consistent level of features. In some cases, as for the customer target segment of Unengaged Discoverers even with more technological advanced features, as in the case of Smart products.

Pain Relievers

Nonetheless, as already mentioned, the considered target segments have in common a quite high price sensitivity, they are in some cases refractory to the use of new technologies – e.g. Traditional way - and in other cases willing to have easy-to-use appliances – Unengaged discoverers -.

Among the “Pains” it must also be included the lack of space, in houses often thought for a reduced number of family members (only 2-3 people) and a reduced amount of time to be dedicated to housekeeping, especially for the two upper level segments Unengaged Discoverers and Home Sweet Home. As a matter of fact, being the latter two segments quite committed to their work life, they would usually dedicate a lower portion of their time for their private life resulting in an only few time spent at home.

Furthermore, being individuals belonging to the segment Unengaged Discoverers quite young, they could have only little experience in the usage of home appliances.

Overall, being the customers segments targeted by Candy quite different between themselves both for demographic and socio-economic factors, in order to provide a satisfactory level of offer, when designing its products, the brand will have to focus on the satisfaction of key needs, such as ease of use, functionality, low price and design and then on differentiating the offer according to more specific needs defined within each target segment.

The Brand's Value proposition should include among the pain relievers easy and fast to use products, efficient appliances, providing the possibility to control the washing cycles remotely.

Moreover, in order to meet the need of the targeted customers segments for cheap products, because of their lower purchasing power, the brand provides within its offer also entry level products with basic features.

Ultimately, to meet the need of part of the target for more compact products, Candy has been including, for several years, within its offer also slim washing machines.

On the other hand, in order to provide a valuable proposal, Candy should capitalize on its distinctive values and capabilities: the Italian design and comfort, efficiency and rapidity.

First, Italian design and comfort are in Candy's DNA. Nonetheless, the desire to create new and stylish products, able to express at best their owners' personality, has always been driven by the need and the impulse to create comfortable and better solutions for the final consumer. The architecture of new solutions, cannot therefore prescind from a deeper understanding of customers and their preferences, which ultimately allows the brand to provide tailored solutions to its target segments.

3.2.1.1 Candy Washing Machines and Washer Dryers Product Portfolio

Candy offers a broad variety of products all characterized by accessibility in terms of ease of use and value for money, Italian design and ultimately smartness, both for innovation and connectivity.

With an entry level positioning in Candy's product range, Candy Smart accounts for stylish and easy to use washing machines and washer dryers, endowed with one of the latest NfC technologies in the market and with a Universal motor. Furthermore, thanks to the Candy simply-Fi App, consumers can receive useful tips and reminders about their favorite washing programmes, saving time and money.

Belonging to the same family, still at entry level, but with a higher positioning comparing to Candy Smart, Candy Smart Pro washing machines and washer dryers are additionally endowed with a complete set of nine Rapid programmes, which allow consumers to complete their washing cycles in less than one hour. In addition, the new Smart Text Display provides a better visualization of all of the programs, options and cycle information in native language, making even more simple for consumers to manage their washes.

Furthermore, the latest wifi + Bluetooth technology allows to control the appliance from remote thanks to a smartphone, while the Candy simply-Fi App supports consumers with useful tips about their favorite washing cycles.

Still within the same product family, but with an even higher positioning, the Smart Inverter washing machines and washer dryers are endowed, along with all the previously mentioned features in common with Candy Smart, with the latest generation of BLDC motor, which allows these appliances to reach the highest energy class possible, making them more durable, silent and efficient.

With a better mid-high positioning within the Brand's product portfolio, RapidO' washing machines and washer dryers offer a set of nine quick cycles, saving time and contemporarily ensuring the best washing results thanks to the new Speed Drive Motor, an innovative technology capable to increase up to 50% the cleaning action of the machine.

Additionally, from the aesthetical and functional point of view, RapidO' is equipped with the highest and largest door hole in the market, considerably reducing the effort of placing and removing garments from the appliance's drum, while the slightly oblique positioned display allows consumers to comfortably choose their favorite washing cycles, by simply standing in front of their machine.

Moreover, the latest wifi + Bluetooth technology allows to control the appliance from remote simply through a smartphone, while the Candy simply-Fi App supports consumers with useful tips, helping them to find the best cycle according to amount, type and colour of laundry, by simply snapping a picture of their garments.

Ultimately, thanks to the simply-Fi App or through the use smart speakers such as Alexa and Google Home, consumers will enjoy talking to RapidO', getting answers about ideal washing methods, stains removal and much more, overall enhancing their washing experience.

With a superior positioning within the Brand's Product portfolio, Bianca alone represents the perfect synthesis of the kind of smart innovation Candy believes in, having a real, authentic impact on people's needs and being designed to make their daily lives easier. In addition, thanks to the Candy simply-Fi App, final users will be able to start and stop their washing cycles and refresh programs remotely, discover useful functions such as

energy reduction management and auto maintenance programs, all available in their own language.

Furthermore, the Mix Power Jet+ System, consisting of a premix of water and detergent injection into garments helps to guarantee the best washing results in a short time.

Ultimately, with its Smart Ring knob displaying big characters and icons, which makes the programmes easy to read, Bianca preserves the characters of ease of use, accessibility and functionality, despite the quite high level of innovation.

Measuring 70 cm tall, 51 cm wide and 45 cm deep, and with a loading capacity varying from 3.5 to 4kg, Aquamatic is surely the smallest washing machine on the market and it perfectly fits small spaces such as studio flats, caravans and boats.

Because of its size this washing machine is perfectly able to answer specific needs, targeting mostly single people, students and young couples for whom greater loading capacity washing machines would be unnecessary.

3.2.2 Aquamatic

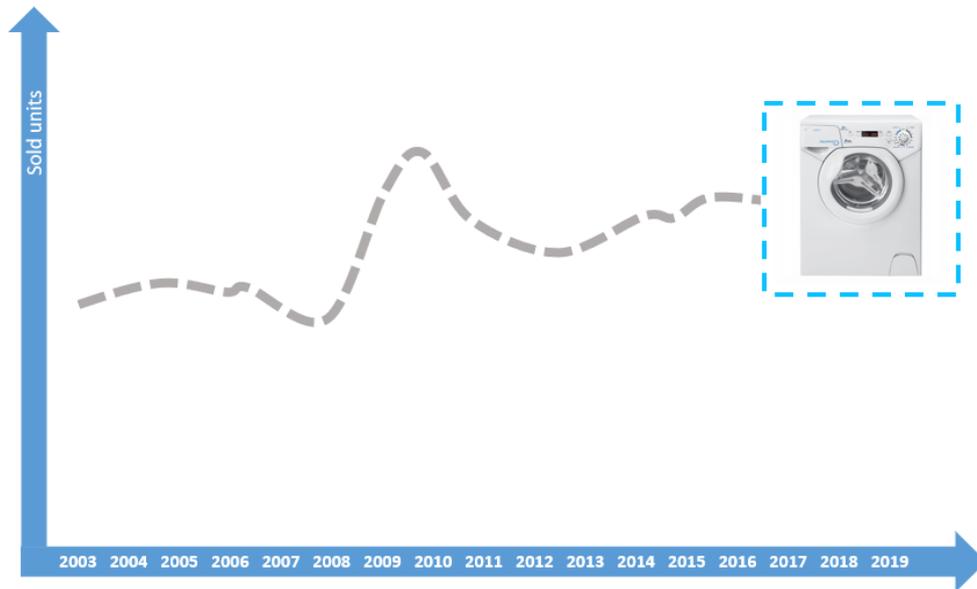
3.2.2.1 Aquamatic Product Life cycle

The first available sales data about Aquamatic date back to 2003, when it was launched on the Italian market.

From that moment until 2006, the sales curve remained stable, with some initial incremental product innovation concerning the spinning speed and the display type.

This phase might be considered the Market Development stage in terms of Product Life Cycle.

Figure 3.2.2.1 Aquamatic Product Life cycle



Data Source Internal GFK report

However, between 2006 and 2008 the sales curve experienced a steep decline until reaching its historical minimum in 2008. This negative trend might be explained by the World Financial crisis of 2007-2008, which led to a demand compression, especially for products like Aquamatic, which is often used, because of its small size, for boats or second houses. The sharp decrease in demand also means that demand elasticity to income is quite high for Aquamatic.

Afterwards, at the end of 2008 the sales curve started rapidly increasing again, thanks also to even further aesthetical adjustments, until peaking at the end of 2010. This might be considered the period of Growth for Aquamatic, where however sales are positively affected by the demand compression of the previous period, which probably led some consumers to postpone their purchase decision.

However, by the beginning of 2011 the sales curve started declining again, and then, overall flattening, having the product reached its Maturity stage.

3.2.2.2 Aquamatic Pet

Since the half of February the marketing washing team has started developing a new project: the first pet-dedicated washing machine on the market.

This product innovation, could be mostly referred to as trial to extend Aquamatic Product Life Cycle, undertaken by increasing the number of possible usages of an already existing washing machine, through its restyling.

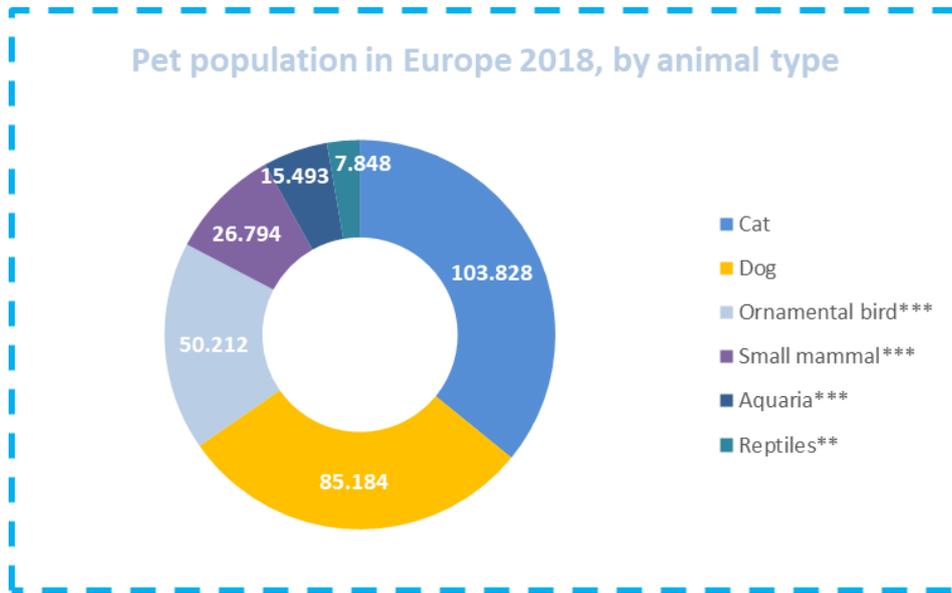
In addition, a first technical request already existed, since the new product idea had already been developed in collaboration with the market and therefore much of the information such as the required loading capacity, the type of display and the number of pet dedicated programmes was already known.

3.2.2.2.1 Market Research

The Market Research purpose was first to assess the main market features and second to evaluate whether beside the Italian market, some other European markets could have been receptive to the new product offer and therefore eventual latent markets.

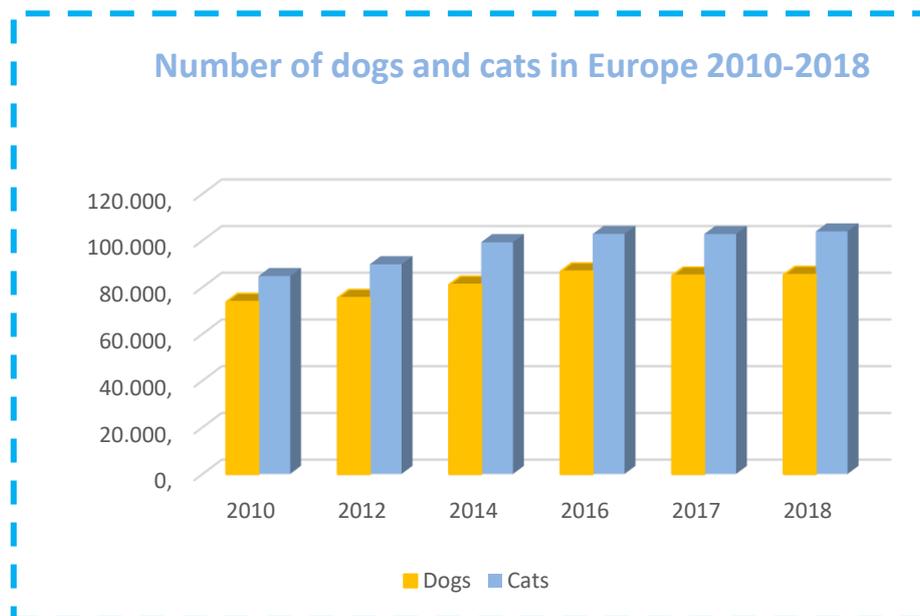
First, when considering the quantitative data about the number of pets in Europe, it is important to notice how cats and dogs account for most part of them, about the 65% of the total. This result is particularly important since the new product would have as consumers target mainly dogs and cats' owners, which on average are more likely to purchase pet clothes, and to be willing to wash sheets, pillows and carriers of their four-legged friends.

Figure 3.2.2.2.1 Pet Population in Europe by animal type, 2018



(Data Source(s): FEDIAF; Statista)

Figure 3.2.2.2.1.1 Longitudinal analysis on the number of dogs and cats in Europe, years 2010-2018

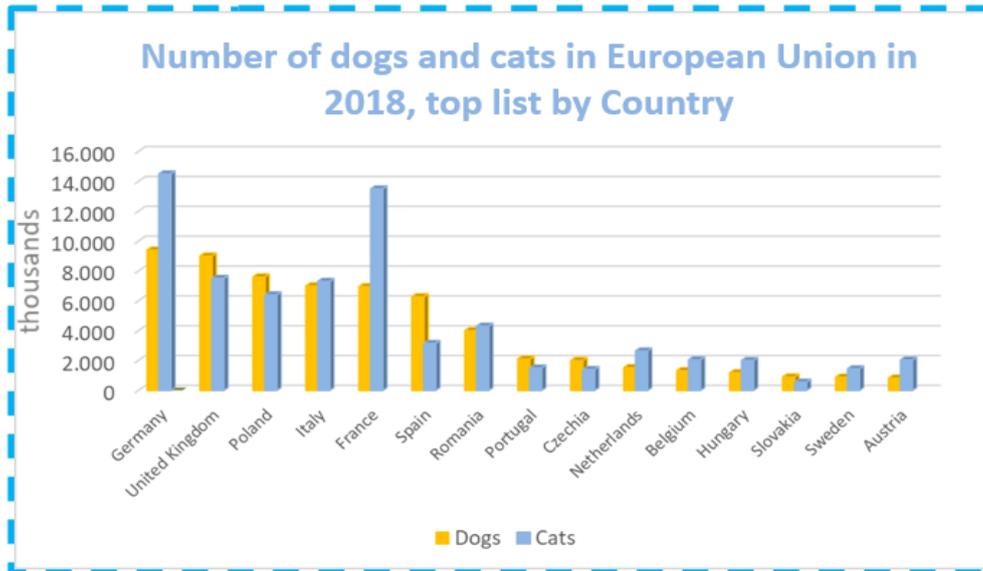


Data Source(s): FEDIAF; [ID 515579](#)

Next, the quantitative analysis moved on, trying to assess on a longitudinal base the numerical trend of two of the most important pet categories: dogs and cats. The finding was, over the years, an overall increase in their absolute number, with a quite high

preference of Europeans for cats. In particular dogs increased in a eight-year period by + 15,67 % Dogs, while cats number increased by 22,58%.

Figure 3.2.2.2.1.2 Number of dogs and cats in European Union, by country

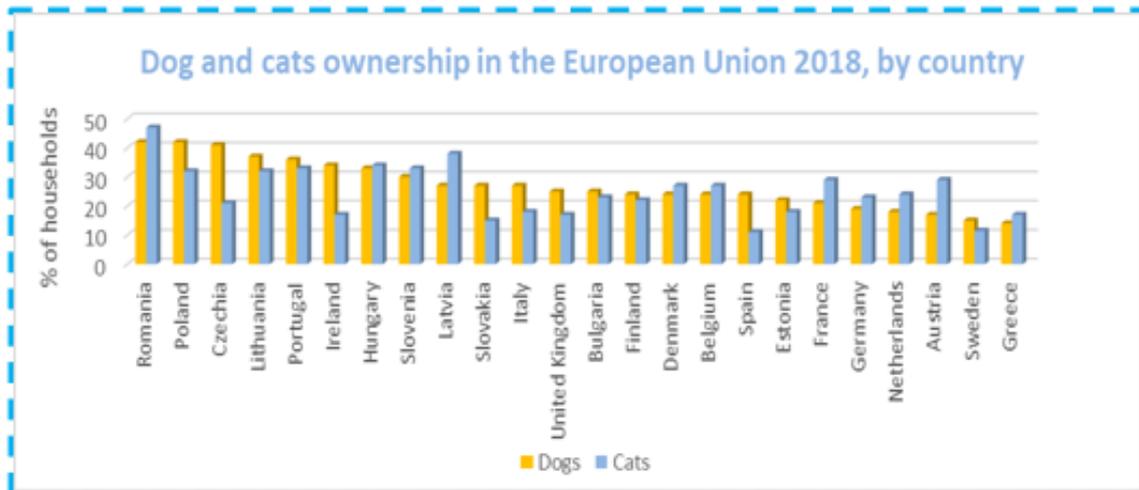


Data Source(s): FEDIAF; ID 414956; ID 515410

Afterwards, a further assessment was carried out to verify the popularity of the two categories of four-legged friends, by country.

The results outlined, once again, a remarkable preference of European consumers for cats, and in addition, it was possible to determine a cluster containing the most interesting countries according to the number of pets: Germany, United Kingdom, Poland, Italy, France, Spain and Romania.

Figure 3.2.2.1.3 Share of households owning a dog or cat, by country, in European Union



Data Source(s): Statista FEDIAF; ID 414956; ID 515410

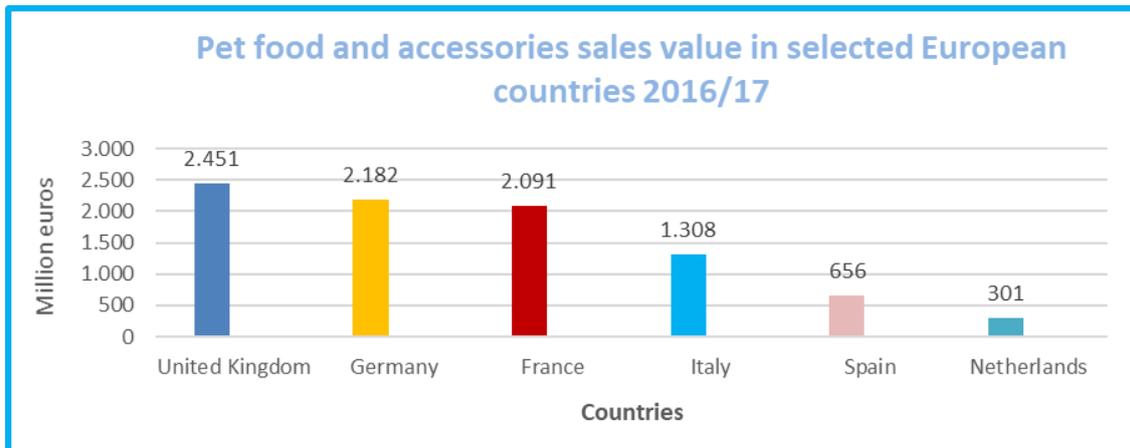
Furthermore, since the absolute number of pets in the European Union was not enough to define the market potential, an ulterior data was taken into consideration, that is the distribution of pets among the European families.

As a matter of fact, a broader distribution of pets and a higher percentage of households owning a cat or a dog, would imply a higher market potential, since it would likely mean a higher number of families willing to wash their pets' garments separately.

In particular, among the countries having some of the highest shares of pet ownership there are: Romania, Poland, Czech Republic, Lithuania, Portugal, Ireland, Hungary Slovenia, Latvia, Slovakia, Italy, United Kingdom, Bulgaria and Finland.

The above results might lead to the conclusion that all of the mentioned countries, having the highest pet ownership share, are the best potential markets, where a new pet- dedicated washing machine could be placed.

Figure 3.2.2.2.1.4 Pet food and accessories sales value



Data Source(s): Statista IRI; ID 343105

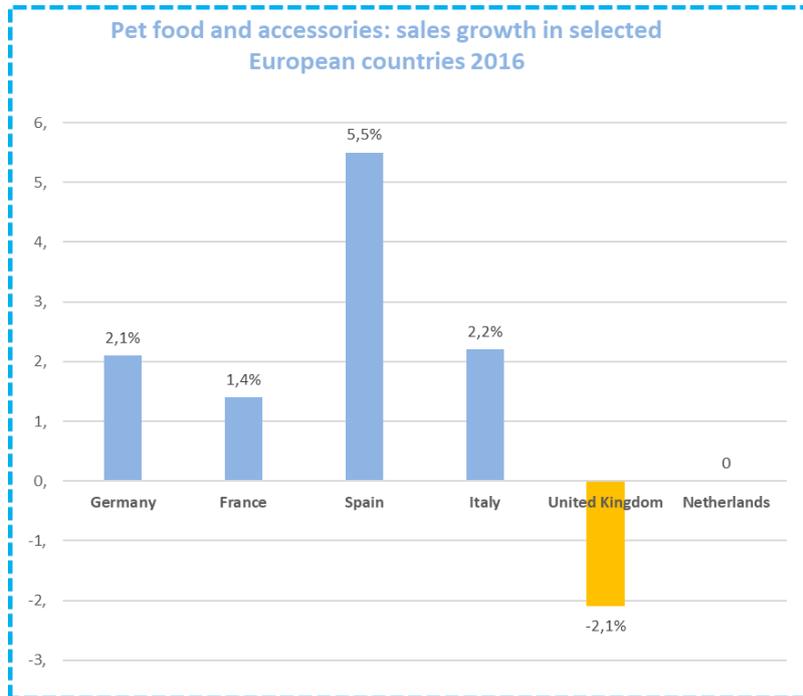
However, a better assessment must include also data about consumers' pet related expenditure, which in turn means answering to the question: how much pet owners are willing to pay for their pets? And in what countries are they willing to pay the most? What are those countries where pet expenditure for food and accessories has grown the most over the years?

In order to address the first two questions, it has been analysed the data about pet food and accessories sales value in European countries in the year 2016/2017. The finding was a higher pet food and accessories expenditure in countries such as United kingdom, Germany, France, Italy, Spain and Netherlands.

Furthermore, another aspect which has to be taken into consideration when assessing the most interesting potential markets, was the data about pet food and accessories sales growth.

In particular, as illustrated in the Figure below, in year 2016 the countries experiencing the highest growth were: Spain, Italy, Germany and France, while the UK registered a sharp decrease in pet food and accessories sales growth.

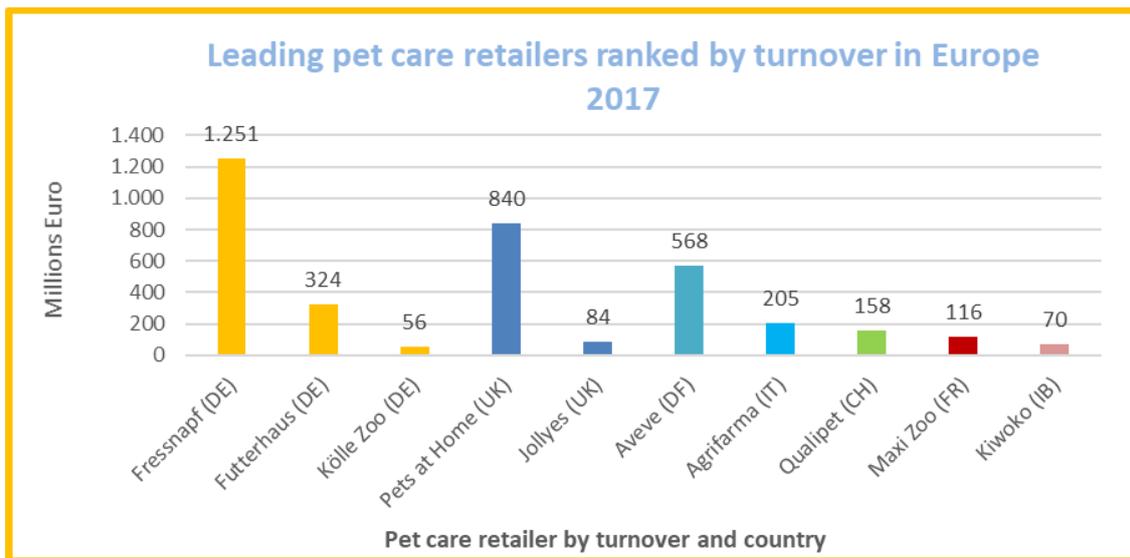
Figure 3.2.2.1.5 Pet food and accessories sales growth for the selected countries, year 2016



Data Source(s): Statista IRI; ID 329405

Ultimately, a further data that was analysed in order to evaluate the most attractive markets, and even possible retailers, was the turnover recorded in 2017 by the leading pet care retailers in Europe.

Figure 3.2.2.1.6 Leading Pet care retailers by turnover in Europe 2017



Data Source(s): Statista- Retail-Index; ID 921466

As shown in the Figure 3.2.2.2.1.6, once again, the highest turnover was registered for German and UK retailers, while also Dutch, Italian, Swiss, French and Spanish positioned themselves in the top ten.

Putting together the first and third Figures, it must be concluded that the most attractive markets, in terms of sales value, are the United kingdom, Germany, France, Italy, Spain and the Netherlands. As a matter of fact, the latter countries might be defined as latent markets, where indeed a quite high demand for pet accessories already exists, and therefore it might exist the need for a pet-dedicated washing machine, while no competitors are offering similar products to fulfil that need. In this scenario, lacking a direct competition, Candy would be able to easily step into the new market, as long as able to convey the benefits of a pet-dedicated washing machine and would enjoy in this way the “first mover advantage”.

In addition differences in countries’ relative positions encountered between the first and third table, might be due to a higher presence abroad of some German, Dutch, Swiss and Spanish retailers, which might have pushed their turnover above the one of their competitors, even if located in more profitable markets (e.g. UK market). Conversely, other retailers such as Pets and Home (UK), Jollyes (UK) and Maxi Zoo (French) might have decided to keep their brand more at national level, forgoing part of the foreign turnover.

Ultimately, we could confirm that the Italian market might be a potentially a good market for the new pet-dedicated washing machine. However, along with the latter other potentially good markets could be respectively: the UK market, with profitable retailers such as Pet and Home and Jollyes and the German market, with important retailers such as Fressnapf, Futterhaus.

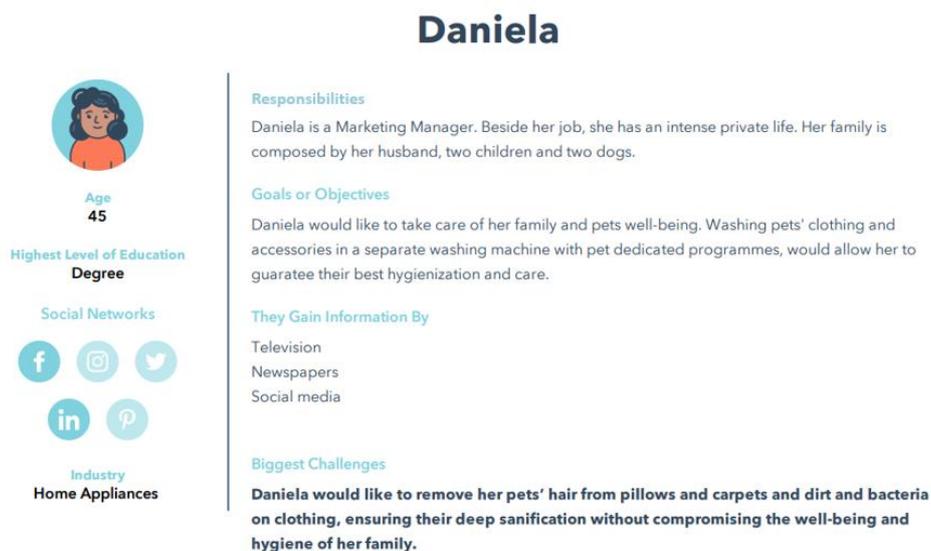
Competition Analysis

In this case, as already anticipated in the previous paragraph since the pet-dedicated domestic washing machine would be the first on the market, no competitors were found on the relevant markets.

Buyer Persona

A further analysis was carried out to understand what the real consumers needs are. At this purpose, it was created, through the online tool make my Persona, a concrete example of the ideal consumer interested in buying a pet-dedicated washing machine.

Figure 3.2.2.1.7 Buyer Persona Profile



Daniela is a 45 years old woman, working as a Marketing Manager in a home appliance multinational company and having a medium-high income.

Daniela has a busy private life, with a husband, two children and two dogs. However, when it comes to washing her favourite pets' clothes, she would like to have a dedicated washing machine, in order to easily separate her family laundry, guaranteeing the highest

possible degree of cleanness for both humans and four-legged friends. A lower loading capacity washing machine would be a plus, fitting even in the smallest spaces.

She is concerned about her dogs' hair removal from carpets and pillows and she would like to sanitize their clothes and toys separately, with pet dedicated programmes.

Ultimately, Daniela is particularly keen on the usage of social media, especially Facebook and LinkedIn, so the best way to reach her, would be through a social media advertising campaign.

3.2.2.2.2 Value proposition

Consequently, given the results of the buyer persona analysis, it was built a Value Proposition which could put together and provide an answer to the main ideal consumer's needs, resulting in the one proposed in Figure 3.2.2.2.2.

Figure 3.2.2.2.2 Aquamatic Pet Value Proposition

When it comes to caring for the **well being** of your family and pets, there should be **no need for compromises**.

Aquamatic Pet is the first domestic washing machine entirely dedicated to the cleanness and **care of your pets**.

From now on, you will be able to comfortably **wash** your pets' **clothing** and accessories **separately**, without any renounce!

With a full set of **dedicated** and intuitive washing **programmes** Aquamatic pet ensures the best cleaning results respecting fabrics and, more importantly, the well-being of your four-legged friends.



3.2.2.2.3 New Naming strategy

Furthermore, the new product creation required the revision of the naming strategy. As a matter of fact, the old naming Aquamatic and sub-naming Tempo, which are still in use for the “parent” human suited washing machine, were not able to convey the commercial message of a completely new pet-dedicated appliance.

Therefore, after analysing several ideas, it was opted out for the new naming AquaPet, containing within it partially the parent’s naming (Aqua-matic), reminding the specific appliance’s purpose - washing clothes - and ultimately containing the key word Pet, which recalls the other main feature of this washing machine, that is having pet-dedicated programmes.

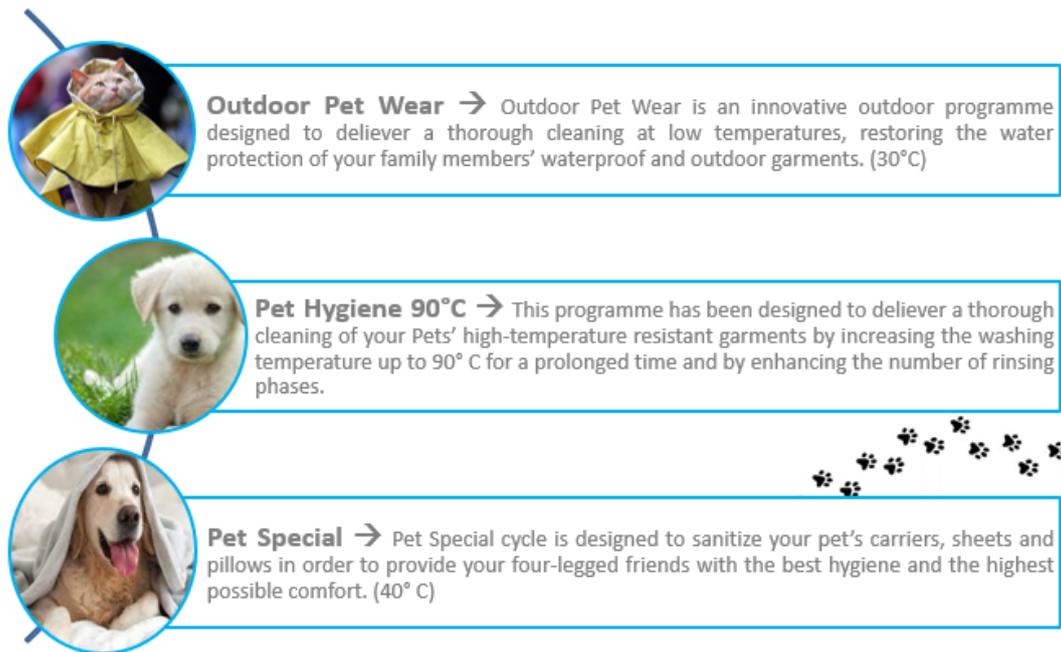
3.2.2.2.4 New programmes and icons definition

Another fundamental step in this project development, was the definition of a set of pet-dedicated washing cycles, which could appeal the possible final consumers, ultimately convincing them to buy AquaPet.

Although, the initial request from the market was to have two pet-dedicated washing programmes, at a preliminary stage it was preferred to provide to the market a broader choice of programmes among which the favourite cycles could be chosen.

Ultimately, after presenting six different programme options proposals, a preference was expressed for the three programmes below: Outdoor Pet Wear, a low temperature washing cycle completely dedicated to the care of pets’ outdoor garments; Pet Hygiene 90°C, a sanitizing programme designed to deliver a thorough cleaning of high temperature-resistant pets’ garments; and Pet Special, a programme designed to sanitize pets’ sheets, carpets, carriers and pillows at a temperature of 40°C.

Figure 3.2.2.2.4 Aquapet washing programmes



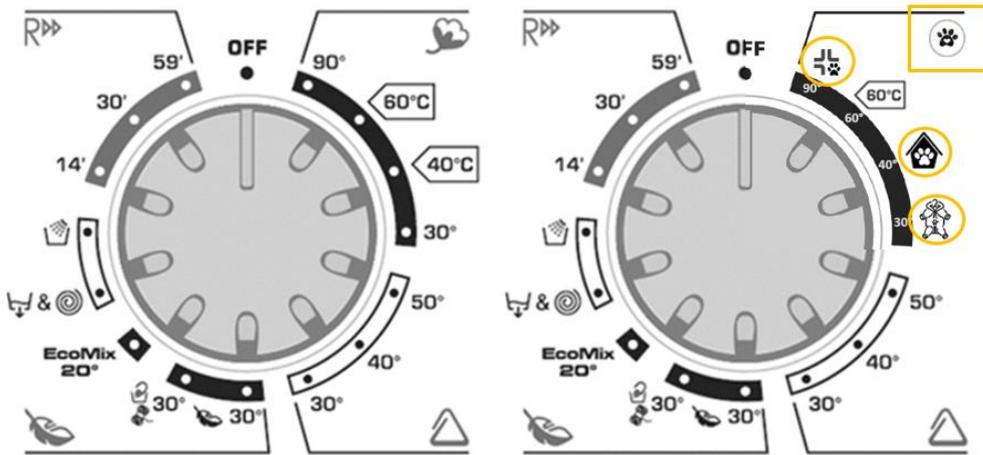
A further issue was then the positioning of the selected programmes on the product's bezel and knob. However, since from the inception one of the project challenges was to minimize the number of changes comparing to the “parent” product Aquamatic, the ultimate choice was to substitute them into those programmes having already set the same temperature, in order to avoid reprogramming the machine's firmware. In addition, programme icons were chosen to be as much as explanatory as possible.

Ultimately, although several positioning options were available, it was chosen to place all of the pet-dedicated programmes in a specific section of the machine, in order to be easily identifiable by target consumers.

Therefore, after this first substitution, the icons configuration around the knob appeared as in Figure 3.2.2.2.4.1 in the right picture, while on the left it is displayed the original Aquamatic knob.

Afterwards, since many of the programmes symbols were not updated, a further step was made in order to substitute those icons with new ones.

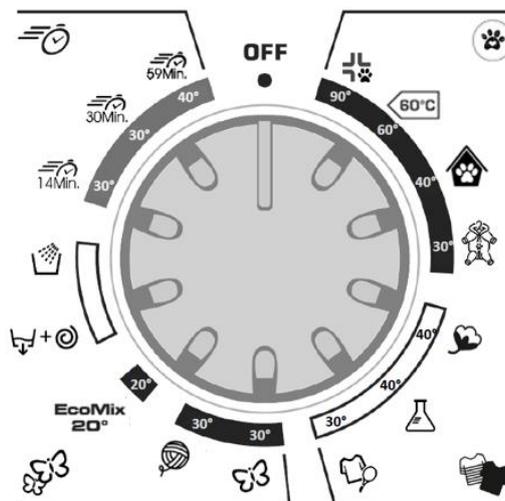
Figure 3.2.2.2.4.1 Knob washing programmes and icons allocation



Hence, after the latest substitution, the new outlook of AquaPet’s knob was the one presented in the Figure 3.2.2.2.4.2.

However, even in this version, two programme icons, respectively 60°C and EcoMix 20°, still had to be updated according to a new European Regulation, the New Energy Label, which must be applied to all of the products destined to the European market and will be illustrated in a more detailed manner in the next paragraph.

Figure 3.2.2.2.4.2 Washing programmes icons positioning without New Energy Label ones

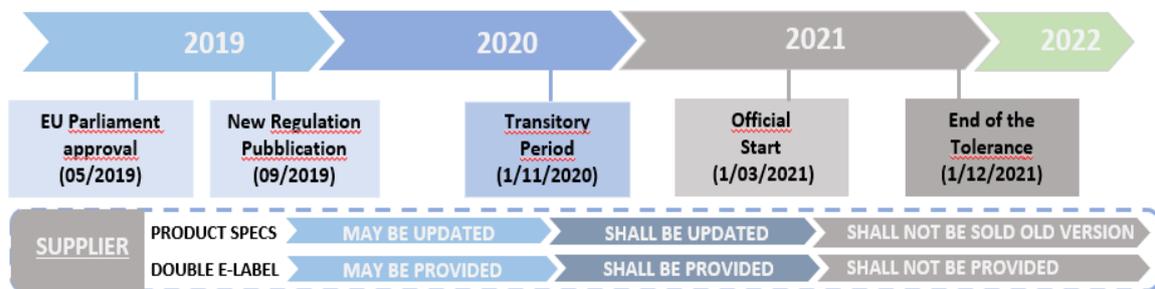


3.2.2.2.5 The new Energy label European Regulation

In May 2019 the European Parliament approved the [...]final format and visual identity of new energy efficiency labels for five groups of household appliances, which will all display "rescaled" energy labels [...]. These five groups encompass [...] dishwashers, washing machines and washer-driers, refrigerators, including wine storage fridges, lamps, and electronic displays, including televisions monitors and digital signage displays [...]

(<https://www.buildup.eu/en/news/new-energy-efficiency-labels-explained>)

Figure 3.2.2.2.5 New Energy Label implementation deadlines



Source: Elaboration on data contained in WM, MIT V3, page 90., slides, Candy Group

In particular, from the 1st of November 2020 it will start a transitory period which will last until the 1st of March 2021, date when European consumers will be able to see in physical stores and on-line these new labels. Furthermore, even after the latter official date of the new Energy Label transition, the European Union has defined a tolerance period which will start from the 1st of March 2021 until the 1st of December 2021. During these three periods of time, respectively products specifications may be updated until 1st of November 2020, shall be updated from the 1st of March 2021, while old energy labels shall be provided along with the new ones, whereas from the 1st of December 2021 no old energy label products should be sold and not even old energy labels should be displayed on products.

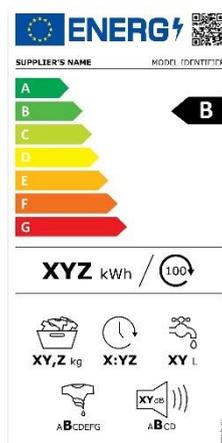
Furthermore, these new energy labels, differently from the old ones, will display the energy class in a range from A to G.

Indeed, despite the successful introduction in 1995 of the old energy label, which became broadly used and recognized between consumers when purchasing, the EU needed to find a solution to an inconvenience. As a matter of fact, the energy classification has led throughout the years to a higher and higher competition to innovate, with new appliances placed on the market progressively moving up in energy classes (https://ec.europa.eu/commission/presscorner/detail/en/MEMO_19_1596)

And yet, despite being most of the products initially placed in the lowest classes (i.e. E, F, G), new models deserved higher and higher classes until the situation where nowadays most of them are in the top classes (A+++, A++, A+), with no products having assigned the lowest ones (in some cases, not even A). (https://ec.europa.eu/commission/presscorner/detail/en/MEMO_19_1596)

Figure 3.2.2.2.5.1 The New Energy Label

(https://ec.europa.eu/commission/presscorner/detail/en/MEMO_19_1596)



Nonetheless, such a positive result has made more and more difficult through the years for consumers to distinguish the best performing products. For instance, consumers

buying an A+ product might think they are buying one of the best products on the market, while in reality that product might be just an average product or even one of the least efficient on the market (https://ec.europa.eu/commission/presscorner/detail/en/MEMO_19_1596).

Therefore, in order to facilitate for consumers the comparison between different products, the EU has adopted a revised energy labelling system consisting of:

A. “A return to the well-known and effective energy labelling scale 'A to G' for energy efficient products, including a process for rescaling the existing labels” (https://ec.europa.eu/commission/presscorner/detail/en/MEMO_19_1596).

B. “A digital database, EPREL, for new energy efficient products, so that all new products placed on the EU market are registered on an online database, allowing greater transparency and easier market surveillance by national authorities (https://ec.europa.eu/commission/presscorner/detail/en/MEMO_19_1596). This data will become accessible in the next months to all the European consumers, through a QR code contained in the new energy labels, which will enable them to obtain even additional, official (non-commercial) information, simply scanning the code with a common smartphone (https://ec.europa.eu/commission/presscorner/detail/en/MEMO_19_1596).

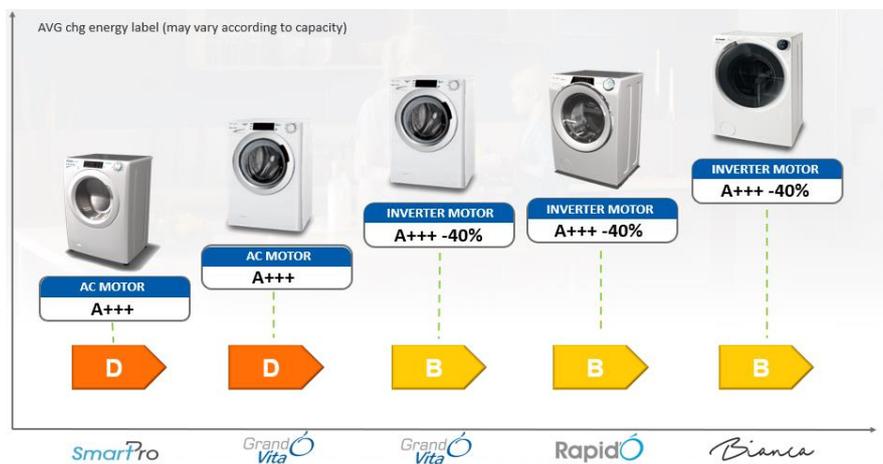
Furthermore, for washing machines the new energy labels will display not only information related to the energy consumption but also other non-energy information such as those about noise level and water consumption, displayed with intuitive pictograms, which will allow consumers a better comparison between different products and a more aware purchase choice.

C. For the washer-dryers category, the New Energy Labels will display two separate energy classes: the one for washing machines (Front Loader) and the one for Dryers.

D. For the segments of washing machines and washer-dryers, the New Energy Label will require the implementation of new normative washing programmes with their relative pictograms (icons). In turn, this means the necessity to rethink and reorganize the bezels displaying those new cycles for all of the products belonging to the brand's product portfolio.

In addition, since a rescaling of the energy classes would mean for the Brand having many of its products collocated in lower positions comparing to the pre Nel introduction period, as shown in the Figure 3.25 below, Candy took the chance to renovate, along with its products' bezels and energy labels, also specific features, which would allow products in the Brand's range to reach higher energy classes. Hence, it was included within the transition to the new energy label, also the revision of products' engines and the introduction of the innovative MPS technology, a premixing system, which creates an emulsion of water and detergent, removing all stains from garments at lower temperatures, reducing energy and water consumption.

Figure 3.2.2.5.2 Old Products' range energy classification with the New Energy Label introduction
(WM, MIT V3, Candy, p. 98, slides, Candy Group)

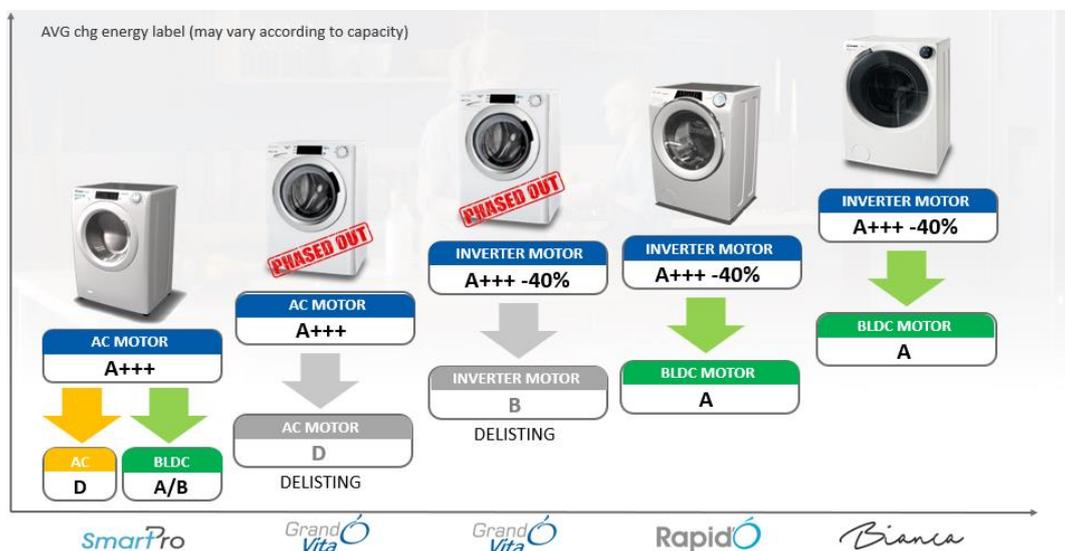


As shown in the table, keeping those additional features the same, the Smart Pro family of products would reach from a previous A+++ energy class, only the D class in the period

post new energy label introduction. The same would be for GrandO' Vita, maintaining the AC motor, which would have reached only the D energy class, while all of the other products GrandO' Vita, RapidO' and Bianca endowed with Inverter motor would have reached the B class. However, the latter energy class wouldn't be favorably seen by markets, especially considering that products such as Bianca are considered Top range products.

Therefore, taking the chance of the already necessary changes which would be needed for the product range transition to the New Energy Label, the Brand's product management, decided to proceed as below, basically substituting motors, including new energy and water saving features and phasing-out some of the models existing in the previous product range, such as GrandO' Vita.

Figure 3.2.2.2.5.3 New Product Range, transition to the New Energy label
(WM, MIT V3, Candy, p. 99, slides, Candy Group)



This way, some of those Smart Pro models maintaining the AC motor, in the low product range will anyway reach the D class, consistently with the applied price, while some of the Smart products family such as Smart Inverter, endowed with the latest BLDC motor would be able to reach the B or even the A class. Whereas, even in the RapidO' and

Bianca models, previously endowed with Inverter motor, the latter was substituted with the latest BLDC motor, which represents an evolution of the Inverter.

The New Energy Label transition for Aquamatic and AquaPet

The same process of New Energy Label transition has to be undergone also for Aquamatic and new Aquapet models.

As already mentioned the main elements which will be updated will be the Bezel, with new graphics and new normative cycles, the programmes list, the User Manual and Quick Guides (for international models) containing the programme tables, the machines’ firmware and ultimately the energy label displayed on the machine.

Figure 3.2.2.2.5.4 New Energy Label adjustments for Aquamatic

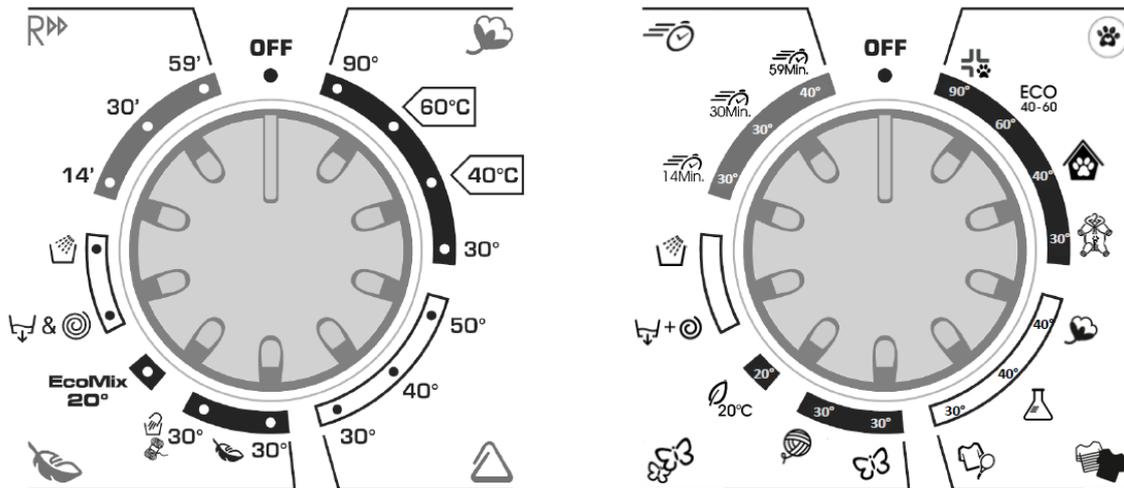


Source: Elaboration on WM, MIT V3, Candy, p. 99, slides, Candy Group

A particular attention deserves in this process the programme list which according to the new regulation should include the programme 20°C and the ECO 40-60, substituting respectively the three programmes Eco Mix 20°C, Cotton 40°C and Cotton 60° C.

Hence, after the new normative and pet-programmes were implemented on AquaPet, the result was the one following:

Figure 3.2.2.2.5.5 Comparison between Aquamatic knob (left) and the latest AquaPet knob (right)



On the left it is displayed the old Energy label knob of the original Aquamatic washing machine with its own programmes, whilst on the right it is presented the Aquapet new Energy Label compliant knob with Pet-dedicated programmes.

Afterwards, since according to the new Energy Label regulation the new programmes and product specifications have to be inserted in EPREL, a feasibility analysis was asked to the operators working in the laboratories, in order to verify whether the programmes had been correctly positioned.

After the new bezel configuration approval by laboratories, the project moved on with a further and final step. It was asked to a team of designers to provide a new design and for AquaPet since an overall revision of the machine aesthetics was required.

In particular it was needed a design for the new naming or sub-naming for AquaPet, along with its relative logo which should have reminded the Pet-world and, ultimately, different possible colours for door and knob, in order to differentiate the machine from Aquamatic.

CONCLUSION

The present paper has been written with the aim of investigating Product Life Cycle patterns, assessing the European and Italian Industry Life Cycle evolutionary stage, determining the role of innovation in shaping the single Product Life Cycle paths and the industrial context and, ultimately, how innovation is regarded by companies.

In order to reach this target, the first chapter dealt with a revision of the main Product Life Cycle theoretical notions, including the origins of the Product Life Cycle idea which was initially borrowed by the natural sciences, the stages encompassed within the Product Life Cycle and the best tactics and strategies to be utilized by marketers over a Product life Cycle.

Afterwards, the attention shifted on another macro-topic which has been discussed in the first chapter, that is innovation. Also for innovation a theoretical approach was utilized, describing the importance of innovation and knowledge diffusion and how this is usually managed by companies, along with a series of consolidated practices and techniques helping enterprises to rationalize the process of new products development.

Moreover, since innovation and knowledge diffusion are forces shaping both Product and Industry Life Cycles, facilitating products technological obsolescence, determining the features that products and processes will assume, causing production costs to decrease, and even new competitors to enter the market; this theme could properly be inserted between the bodies of theory of Product Life Cycle and Industry Life Cycle.

To continue with, the second chapter delved first with theory about Industry Life Cycle. In this case, however, the interest was geared more at acquiring the key notions which would enable the analysis of the actual Industry Life Cycle evolutionary stage and hence few key indicators were identified, among them: Demand and Sales, Price and quantities

produced, quality of products and, ultimately, the number of firms in the market, which in turn determines the degree of a market concentration.

Concerning the Industry Life Cycle analysis, it has been undergone considering two reference periods: the one from 1950 until the end of the 20th century, for which much had already been written by several authors, and the one starting with the beginning of the 21st century.

The analysis revealed that the Italian Home Appliance Industry has been one of most flourishing in Europe from the second half of the 20th century. In particular, the growth of the sector within the Italian market in the years 50s and 60s has been the result of very well addressed entrepreneurial choices and opportunities.

Afterwards, the further market development beyond national borders, that took place during the years 70s and 80s, was the result of a superior production capacity and efficiency, but also of the Italian economic downturn and of a consequent decrease of the internal demand, which led Italian entrepreneurs to undertake a market expansion at European level.

Thereafter, an unprecedented wave of acquisitions, that started since the half of 70s and went on over the years, led the industry to a higher and higher concentration with greater companies acquiring smaller ones and to an overall market reorganization.

Furthermore, between the mid of 80s and the beginning of 90s the economy experienced a new phase of expansion. The Italian home appliance industry, strong of the capacity and infrastructures built in the previous years could then furtherly expand and focus more on innovation. It was therefore in the 90s that the Italian competitive advantage was mostly built on innovation. In particular, it has been said that innovation takes place thanks to interaction of actors with different competences, capabilities and objectives

(Roveda, Vecchiato, 2008, p.6), and that it takes place at different levels, which are in turn communicating between themselves: national, regional and sectorial. In Italy, the local and regional levels have assumed a particularly high importance, with the growth of industrial districts, which formed, keeping all other conditions equal, around the most innovative enterprises.

Therefore, it could be appreciated the dual role of innovation in shaping industrial districts, which constituted the base for the Italian Home Appliance Industry development and, by their own, played a fundamental role in fostering ulterior innovation, through the development of a supportive industry.

Nevertheless, despite the promising growth experienced over the years, the Italian Home Appliance Industry was not able to reach a leading position in Europe in terms of sales, despite Italian enterprises had all of the factors which could have allowed the Italian Industry to make it. This was a missed opportunity.

In the upcoming years, the entry of China in WTO in 2001, the global financial crises in 2007, which led in the following years to a demand depression, along with an increasingly high spending power of far East competitors such as the Chinese Haier and South Koreans corporations, decreed a new wave of acquisitions in Europe, especially in Italy. In particular two main acquisitions of two of the major Italian Groups took place respectively in 2014, when Whirlpool acquired Indesit and in 2019, when Haier acquired the Group Candy-Hoover, establishing Haier Europe headquarter in Brugherio (Monza). From this point of view, it might be concluded that, as suggested by Porter, the Italian success in the Home Appliance Industry, cannot be obscured - as in this case - by the present foreign ownership of many – initially - Italian corporations, as long as the degree

of autonomy of local subsidiaries is high, as it is the case (e.g. when the European Headquarter of a certain global competitor is set within the national borders).

Ultimately, concerning the assessment of the Home Appliance Industry evolutionary stage in Europe, it might be concluded, considering the always increasing quality standards, as in the case of the new Energy Label, the low growth rates of demand, and the increasingly higher concentration in the sector, with further acquisitions, that the industry is still in its Maturity stage.

Afterwards, the third and last chapter, presented the study case of the Group Haier Europe. In particular, the analysis has involved an introduction of the Group's history, starting from the Italian brand Candy, including all of the other brands belonging to the Group, until the last acquisition completed by Haier, in 2019.

The further analysis has encompassed the economic, competitive and strategic aspects referring to the whole Group, but with a higher attention on the brands Candy and Hoover, since Haier acquisition is fairly recent, and to the segments washing machines and washer dryers.

Furthermore, the field of analysis shrank down, taking into consideration only the brand Candy. At this point, the assessment delved with a study of Candy's Value proposition and Product Portfolio.

Thereafter, starting from the product range analysis, the study has focused on the Aquamatic washing machine and on the assessment of its Life Cycle evolutionary stage, finding out that the product is at the moment in the Maturity Stage and it seems to be shifting even towards the Decline Stage of its life cycle. Ultimately, the chapter has presented one of the latest product innovations undertaken on the model Aquamatic, that is Aquamatic Pet, a new pet-dedicated washing machine. This latter product innovation

could be mostly referred to as trial to extend Aquamatic Product Life Cycle, undertaken by increasing the number of possible usages of an already existing washing machine, through its restyling.

For Aquamatic Pet it has been presented the market research undergone to find out besides the Italian Market, where the request started from, other European markets could have been receptive to the new product offer and therefore eventual latent markets, finding out that also UK and Germany could be viable markets for Aquapet.

Furthermore, it was shown how from the initial idea, the new naming and the bezel of the machine were defined. In particular, in order to make easier the machine development, it was applied the principle of interchangeability of components developing Aquamatic Pet as a “derived” from the Aquamatic series.

By doing so, the company could pursue the strategy of diversification, having the opportunity to simultaneously reduce the number of component parts for each product and to increase the number of standard components. This strategy, allows to shift the costs of diversification from components production to the assembly phase, through the one that has been identified as a new “philosophy of production”.

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