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Own Brand Product Development

Optimization of the Development Process

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Projecto – Empresa

Mestrado em Marketing

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AGRADECIMENTOS

INDEX

CONTENT:

1. ABSTRACT

The main purpose of this study was to optimize the process of developing and launching new own brand products in the Perishable Commercial Department from a large retail company in Portugal. Specifically, study the process currently in use and identify its weakest points, in order to make it faster and more efficient.

Data selection was carried out and a methodology for its analysis was established, in order to achieve the company's goals and concerns, namely, the importance of launching the best products as quickly as possible to the market.

SUMÁRIO

O grande objectivo deste projecto consistiu em optimizar o processo de desenvolvimento e lançamento de novos produtos de marca própria na Direcção Comercial de Perecíveis de uma grande empresa de retalho em Portugal. Mais concretamente, estudar o processo actualmente em prática e identificar os seus pontos fracos, de forma a torná-lo mais rápido e eficiente.

Foi necessário proceder a uma selecção dos dados a utilizar, estabelecer uma metodologia de análise e ir ao encontro dos interesses e preocupações da empresa, nomeadamente a importância de lançar os melhores produtos da forma mais rápida possível para o mercado.

2. EXECUTIVE SUMMARY

The main challenge of any retail company is to satisfy the needs of its client, to fidelize and win their trust. Their true ambition is to continuously search to offer the right product, in the right time and place, and with minimum costs.

With the advent of a new strategy made by some retail companies, the use of a private label became a following example worldwide; the supplier brand became the retailer brand. Having the power of distribution on its side, the retailer was easily able to convince its suppliers to sell their products through its brand and with a significant decrease on the costs. The suppliers did not have much of a choice; not acceptance would increase their losses and they would not be able to drain their products into the market.

Regarding the retail companies, the amount of products that they would have has their own brand and the ability to manage them, led to a significant change of its structure and skills. In addition to all logistics and storage procedures already existent, now they are faced with a new one: the own brand product development and launch, and the management of each. It was at this point that these companies realized one of the great difficulties that all types of production companies face: the time spent developing its own products and putting them into the market.

Any company producing any kind of product wants to see it being produced quickly and entering the market as soon as possible. Furthermore, they also want their products to have the best quality possible to meet the consumer expectations. To make it possible, the company has to be structurally organized and prepared for any challenge that would come, regarding the development of their products.

This study was conducted in a business environment, by carrying out a five-month-traineeship in a large retail company. With allowed access to all company's data, the main objective was to optimize the process of developing new own brand products, assuring the quality of the process in all its stages.

After the literature review on the subject and a period of acquiring knowledge about the company's business, it was clear the need to develop a new type of procedure, based on the one in current use, by setting timings for each stage of the process and developing a new database that could be shared through all the teams responsible for the Perishable Commercial Department.

By so, it was intended to elaborate a methodology that allows a full understand about the best strategies to take into account for the process, in order for it to be more efficient. All results are demonstrated, and conclusions drawn.

Key-words: Product Development, Product Lifecycle Management, Product Launching and Reduce Time do Market.

JEL Classification System:

JEL: M1 – Business Administration: M11 – Production Management.

3. SETTING THE CONTEXT OF THE PROBLEM

The context of the problem studied in this investigation is the result of a constant concern for companies, both national and international, in developing and launching their products more efficiently and quickly into the market.

In Portugal there are three retail companies leading the retail market: Sonae (Continente), Jerónimo Martins (Pingo Doce) and Auchan (Jumbo – Pão de Açúcar). According to APED, in 2010, Sonae led the ranking of companies in the retail sector, by turnover, with 5.203 million euros. Jerónimo Martins is in second place with 3.453 million euros and the Auchan group appears in third place with 1.601 million euros (Annex 11.1). Making the distinction between retail food and non-food, in 2010 the insignia *Continente* led the ranking with a turnover of 3.555 million euros and, in the second, there is the Worten with 765 million euros (Annexes 11.2 and 11.3).

This study rests on the Commercial Department of Perishable Goods of a great food retail company, which integrates six business units (Butcher, Fish, Delicatessen, Bakery and Confectionery, Fruits and Vegetables and Take-Away), who are directly responsible for the commercial management of the products, and four other support units: Procurement, Quality Control, Product Development, and Supply and Inventory Department.

By so, this study focuses on a solution that companies should adopt in order to provide the best products on the market that meet the customers' needs and expectations.

4. LITERATURE REVIEW

The literature review presented below exposes the main concepts in the area of New Product Development and exposes the major theories of development models, in order to better fit the purpose for which we propose in this dissertation: Own Brand Product Development – Optimization of the Development Process.

A proper definition of concepts involved in the field of study is complex but necessary, in order to maintain a conceptual consistency throughout the work.

4.1. Brand

4.1.1. Brand definition

The brand is and has been defined in many different ways over the years, depending on the perspective from which the brand is perceived. Often that depends on the academic background of the author/originator of the different definitions (Tilde Heding, Charlotte F. Knudtzen, Mogens Bjerre, 2009).

Stephen King of WPP Group, London, differentiates brand and product as: *A product is something made in a factory; a brand is something that is bought by the customer. A product can be copied by a competitor; a brand is unique. A product can be quickly outdated; a successful brand is timeless.*

Philip Kotler, Kevin Keller and David Aaker refer in their books to the American Marketing Association's definition of a brand: *A brand is a name, term, design, symbol, or a combination of these intended to identify the goods and services of one seller or group of sellers and to differentiate them from those of competition.*

A brand is essentially a company's promise to provide a particular series of attributes, benefits, values and uniform services to consumers (Kotler, 2004).

4.1.2. Brand Identity and Brand Image

If a company treats a brand only as a name, is totally wrong. The challenge in establishing a brand is developing deep positive associations about it. Marketers must decide at what level to anchor the brand identity (Kotler, 2004).

The brand identity should be formed by the physical aspects of the company, by its character and values, by their mission and also by the variables of the marketing mix. It is the concept of the issuer. The brand image is the way the brand is identified and seen by the consumers. It is the concept of the receiver (Mercator XXI, 2004).

In order to create a unique and strong brand, the development of brand identity and brand image is essential (Mercator XXI, 2004).

4.1.3. Own Brand / Private Label

Keith Lincoln and Lars Thomassen define as retailer brands*: Brands owned and sold by the retailer and distributed by the retailer. Private Label covers all products that are produced by, or on behalf of, a specific retailer for sale in their stores* (Keith Lincoln and Lars Thomassen, 2008).

Private label is define as brands that are owned, controlled, merchandised, advertised, priced and sold by the retailer in his store. (Ray Rajesh, 2010).

Other commonly used terms include "store brand" and "own label" but if we want a simple definition, it is that private labels are retailer brands (Keith Lincoln and Lars Thomassen, 2008).

4.2. New Product Development Process

Today, time is on the cutting edge of competitive advantage. The way leading companies manage time – in production, in sales and distribution, in new product development and introduction – are the most powerful new sources of competitive advantage (Robert J. Dolan, 1991).

New product development (NPD) is widely recognized as an important source of competitive advantage, and emphasis is being placed on systems which simultaneously provide quality, variety, frequency, speed of response and customization (John Bessant and David Francis, 1997).

To Avan R. Jasswalla and Hemant C. Sashittal (2000) *speed has become a source of competitive advantage. In the pursuit of accelerating new product development, many are entrusting product innovation to cross-functional teams, which often include not only*

representative from multiple functional groups, but also from leading suppliers, customers, and re-sellers.

In a turbulent, competitive environment in which customers are demanding and speed is essential, the underlying source of superior performance is integration…linking problem-solving cycles, bringing functional groups into close working relationships, and achieving a meeting of the minds in concept, strategy, and execution (Robert J. Dollan, 1991).

To meet these challenges, companies' attention has been placed on internal mechanisms (cross-functional teams, advanced tools, current engineering, etc.) in order to optimize the NPD process.

4.2.1. Product

According to Levitt (1981), a *product* is all the satisfaction of values that a consumer obtains, in an organizational and / or personnel level. Product is also defined as *something that can be offered to satisfy a need or desire* (Kotler, 1995: 26). The product can be understood as a set of attributes (features, functions, benefits and uses) likely to use or exchange, usually in the form of combined tangible and intangible ways (Levitt, 1981).

The concept of *new product*, according to Kotler (1995), covers *original products, modified products and new brands that companies develop, using the efforts of its own R&D departments* (pp.278). We can also consider a new product as a product (good or service) new to the commercialization of a company, thus excluding, products that are only different in the way of promotion, repositioned products. (Crawford, 1991).

As for the Degree of Product Innovation, this can have a wide variation. According to their degree of innovation, the product may be regarded as a breakthrough lower, medium or higher.

4.2.2. Doing it Right - The Stage-Gate® Process

With shorter life cycles and demand for greater product variety, pressure is also placed upon NPD systems to work with a wider portfolio of new product opportunities and to manage the risks associated with progressing these through development to launch. To deal with this, attention has focused on systematic screening, monitoring

and progression frameworks such as Cooper's stage-gate approach (John Bessant and David Francis, 1997).

As the need for product innovation has never been greater, and as Dr Robert G. Cooper argues (2000), there are two ways for companies to win at product innovation: *doing projects right* and *doing the right projects*. To do projects right means that leading companies have focused on the process of innovation, re-engineering their new product process: *Many companies now utilize a Stage-Gate® new product process to drive their new-product projects to market quickly and successfully* (Cooper, 2000: 3). Doing the right projects, the second way to win, means that management focuses on project selection for product innovation, very important and useful for this project, in order to implements the portfolio management principle.

Product life cycles are shorter than ever and new products make the old ones obsolete.

4.2.2.1. New Products – Critical Success Factors

Delivering a differentiated product with unique costumer benefits and superior value is, for Cooper (2000), the top success factor once such superior products have five times the success rate, more than four times the market share and four times the profitability of products that lack this ingredient. The message from Cooper to seek differentiated, superior products, based on the idea that we should spare no effort in the search for product advantage. *Build in a user needs-and-wants study early in your new-product process in order to identify the components of a truly superior product. Use "fly-on-the-wall" or "camping out with the customer" research to identify his or her true and often unarticulated needs. Conduct a thorough analysis to identify weaknesses in your competitors' products.* (Cooper, 2000: 4). And once we get the concept of a viable product, we must constantly test with the costumer through concept tests, protocep tests, rapid prototypes and full-product tests.

Secondly, it is important to have a solid pre-development homework that drives up new product success rates significantly and is strong correlated to financial performance. For Cooper (2000), must be devoted more time and more resources to the activities that precede the design and development of the product: *Up-front homework means undertaking thorough market and competitive analyses, research on the costumers' needs and wants, concept testing, and technical and operations feasibility assessments.* (Cooper, 2000:4).

Also, for the new product process, the voice of the costumer must be an integral part. At the same time, it is really important a sharp definition of the product including, according to Cooper (2000), a target market definition, a product concept and benefits to be delivered, the positioning strategy, and the product features, attributes, performances requirements and high-level specs.

Another pertinent conclusion of the author (Cooper, 2000) is that a marketing plan is an integral part of the new product process, and it should begin early. Also and very important, we should build trough Go/Kill decision points into our process (a funnelling approach), moving towards effective portfolio management, where we can view each new-product project as an investment.

It is also crucial an organization around true cross functional project teams, where functional managers must increasingly play the role of resource providers to project teams and team advisers, rather than bosses. For the launch of new products, there must be a strong fit between the needs of the new-product project and the resources, strengths and experience of the company in terms of marketing, distribution, selling, technology and operations. So, as it is fundamental to attack from a position of strength, it is also important to build an international orientation into the new product process, which means defining the market as an international one and designing products to meet international requirements, not just domestic ones. (Cooper, 2000).

Finally, the role of top management is central to success. *Top-management support is a necessary ingredient for product innovation, though it must provide the right kind of support.* (Cooper, 2000: 6).

4.2.2.1.1. Building the success factors into a new product game plan – The Stage-Gate® Process

A Stage-Gate®[1] process is a conceptual and operational road map for moving a new-product project from idea to launch, improving effectiveness and efficiency, and breaking the innovation process into a predetermined set of stages, each one consisting of a set of prescribed, cross-functional and parallel activities, as we can see in Figure 1.

Figure 1 – The Stage-Gate ® Process
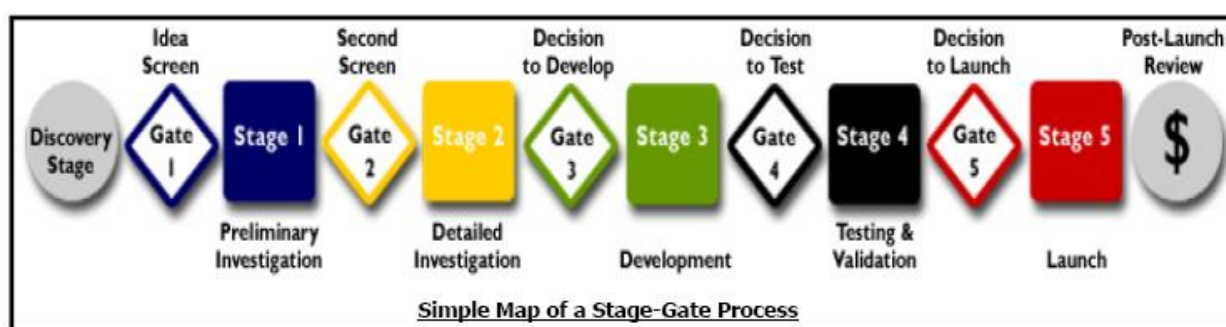
Source: Cooper, Rober G. (2000), "Doing it Right: Winning with New Products", *Product Innovation Best Practices Series*, Product Development Institute Inc.

At the entrance to each stage is a gate, which serves as the quality control and Go/Kill check point in the process (Cooper, 2000).

Stages are where the action occurs and the players on the project team undertake key tasks to gather information needed to advance the project to the next gate or decision point. Stages are cross-functional, meaning that each stage consists of a set of parallel activities undertaken by people from different functional areas in the firm, working together as a team and led by a project team leader.

In order to drive down the technical arid business risks via a Stage-Gate method, the parallel activities in a certain stage must be designed to gather vital information (technical, market, financial, operations). *Each stage costs more than the preceding one, so that the game plan is based on incremental*

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[1] Stage-Gate® is a registered trademark of the Product Development Institute Inc. It is a process developed by Cooper in 1988 to conceive, develop and launch new products.

commitments. As uncertainties decrease, expenditures are allowed to mount and risk is managed. (Cooper, 2000: 7).

The key stages are five, and they consist in *(1) a quick investigation and sculpting of the project; (2) in building the business case, with a defined product, a business justification and a detailed plan of action for the next stages; (3) in the actual design and development of the new product, mapping out the manufacturing process, developing the marketing launch and operations plan, and defining the test plans for the next stage; (4), in testing and validation of the proposed new product; and finally (5) in the full commercialization of the product* (Cooper, 2000).

Preceding each stage is an entry gate, a Go/Kill decision point, as we can see in Figure 1. To the success of a fast-paced, new product process effective gates are central, as they serve as quality-control checkpoints, and as Go/Kill and prioritization decision points, providing the funnels where mediocre projects are successively culled out. According to Cooper (2000), gates are where the path forward for the next stage is decided, along with resource commitments: *Gate meetings are usually staffed by senior managers from different functions, who own the resources the project leader and team require for the next stage. These decision-makers are called "gatekeepers.* (Cooper, 2000: 8).

If a business does not have a systematic Stage-Gate process in place, or if the process is creaky or broken, the time is ripe for an overhaul. Those firms that have made the effort to design and implement such a process have reaped the benefits faster: They are more successful and enjoy more efficient product developments (Cooper, 2000).

In 2006, Cooper moves forward with the proposal to integrate principles of NPD in new-product methodology, resulting in a next generation idea-to-launch process, or NexGen Stage-Gate. Principles as "costumer focused", where the costumer becomes an integral part of the entire process: scoping, product definition, development, validation, and beyond, which begins with the quest for unique, superior products; as "front-end loading", which means that *a good dose of the right up-front homework pays for itself tenfold, saving time*

and producing higher success rates (Cooper, 2006); as "spiral development", a series of build, test, obtain feedback and revise iterations or loops; as "a holistic approach", where the number one key to reduce cycle time and promptly getting to market focuses on the core team, an effective cross functional group that remain involved from start to finish; as "metrics, accountability, and continuous improvement", because as Cooper (2006) argued: "you can't manage what you don't measure". The point is that continuous learning and improvement becomes an integral, routine facet of the development process: every project is executed better than the one before. Top performing companies measure how well individual projects perform by building post-launch and gate reviews into their idea-to-launch processes, and hold teams accountable for delivering promised results against these metrics. "Focus and effective portfolio management", and "a lean, scalable, and adaptable process", are also part of the principles of next generation of idea-to-launch process (NexGen Stage-Gate). As Cooper claimed (2006), by moving toward NexGen processes, companies can make Stage-Gate even more effective. The process must be lean, scalable, and adaptable, ensuring that each principle becomes ingrained in the process' language and method of operation. Success in product innovation requires many behavioral changes, such as discipline; deliberate, fact-based, and transparent decision making; responsible, accountable, effective, and true cross functional teams; continuous improvement and learning from mistakes; and risk taking and risk awareness. *The structure and content of Stage-Gate is a vehicle for change: altering how people think, acts, decide, and work together* (Cooper, 2006).

4.2.2.2. Portfolio Management

The second way to win with a new product is to pick the right projects, complementing a Stage-Gate process with project selection and portfolio management.

Portfolio management deals with the vital question: How should the corporation most effectively invest its R&D and new-product resources? Much like a stock market portfolio manager, those senior executives who optimize their R&D investments - define the right new product strategy for the firm, select winning new

product projects and achieve the ideal balance of projects - will win in the long run. (Cooper, 2000:10).

In portfolio management there are four goals. Firstly, the goal is to ensure that the total worth of new product projects in the development pipeline yields maximum value to the corporation. To maximize the value of the portfolio, one should try to combine the use of a financial model with a scoring model. Secondly, the goal is to achieve the right balance of projects, balancing between high-risk and low-risk, short-term versus long-term, genuine new products versus product improvements and extensions. Achieving a strategically aligned portfolio, where all the projects are on strategy, and where the spending breakdown mirrors the strategic priorities of the business, is also a goal in portfolio management, being necessary to develop a product innovation and technology strategy, to build strategic criteria into the project selection approaches, so that all projects are "on strategy", and to ensure that spending splits by arena and by project type mirror the desired splits and strategy (Cooper, 2000).

Lastly, the aim is based on resource balancing, seeing the correct balance of projects – resource demands with resources available.

Robert Cooper and Scott J. Edgett, in their article "10 WAYS to Make Better Portfolio and Project Management Selection Decisions" (2006), present the 10 best practices of the best companies, with regard to portfolio management and project selection. Under the NPD, is a real challenge to be affective in project selection and resource allocation. As we can see in Figure 2, only 21% of businesses' portfolios contain high value-to-the-business projects, only one in four businesses effectively rank and prioritize their projects, less than one business in five has the right balance in projects in its development portfolios, and 76% of businesses have too many projects for the resources available, which means that projects are under-resources, as it was argued by Cooper and Edgett (2006), and only 21% have a systematic portfolio management or project selection system in place.

On the other hand, companies that are doing well at NPD, also shown in Figure 2, have superior portfolio management practices. *Although far from perfect, these*

best performers effectively rank and prioritize projects, and they boast a systematic portfolio management system much more so than do worst performers[2] (Cooper & Edgett, 2006).

Figure 2 – Portfolio Management Practices
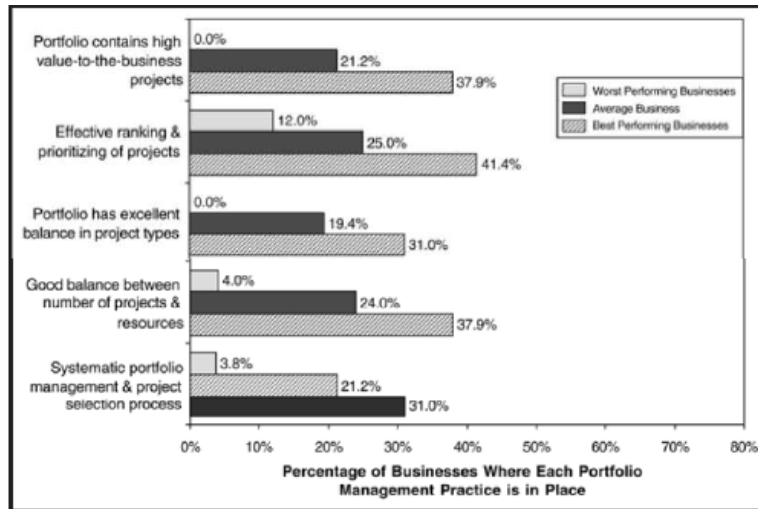
Source: Cooper, Robert G. & Scott J. Edgett (2006), "10 WAYS to Make Better Portfolio and Project Management Selection Decisions", Product *Innovation Best Practices Series*, PDMA Visions Magazine.

To transmit the secrets of those businesses that achieve superior portfolio and NPD results, Cooper and Edgett (2006) show and explain the 10 best practices that leading companies use to improve their project selection methods.

According to studies conducted by Cooper and Edgett, 10 practices improve a company's portfolio management: The first one, *Focus on data integrity; front-end load the project*, focuses on the fact that the lack of good, early information plagues many companies' new product projects. In order to get better data for more effective project-selection, it is necessary to make sure information needs are defined for each of the Go/Kill decision points or gates, and *these information requirements should be spelled out in the form of gate* deliverables *for each of the gates in the business's gating process* (Cooper & Edgett, 2006). It is also imperative, to achieve this first best practice, to *front-end load your projects* (Cooper & Edgett, 2006), that is, to move the center of gravity of the work effort

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[2] As Cooper and Edgett explained, here "best" and "worst" performers were identified on a number of productivity metrics including: NPD profitability versus funds spent; NPD profitability versus competitors; percentage of NPD projects meeting sales and profit targets; and on-time performance).

forward. Before a project moves into the development phase, it must be placed much more management emphasis on doing the up-front or front-end homework.

The second best practice according to Cooper and Edgett (2006) is based on *install a systematic idea-to-launch process and make the gates work*, namely, as it was earlier explained, install an idea-to-launch process or Stage-Gate system, which helps to ensure that better information is available at gates, by defining what key tasks should be undertaken in each of the stages of the project, and by specifying deliverables (what information is really needed at each gate).

Thirdly, *adopt an incremental commitment or "options" approach*, is a practice that has the goal to build in a series of Go/Kill decision points, with each successive gate involving more and more resource commitments, and as resource commitments increase at successive gates, information is better and uncertainties are reduced and risk is managed. As the authors (2006) refer*, the mistake that a lot of management makes is to make an irrevocable "Go decision" on a NPD project very early in the project when relatively little is known, and then never seriously consider stopping or killing the project once past this initial Go decision* (Cooper & Edgett, 2006).

This best practice is directly related to the fourth one, that is *know when to walk away*, which means that Go/Kill meetings must yield some kills, and unless some projects are stopped, according to the authors, the gatekeepers are not doing their job.

The fifth practice, *one size does not fit all*, means that criteria to evaluate and select different categories must be different, because *there are huge differences between small incremental projects, genuine new products, and platform developments* (Cooper & Edgett, 2006). The solution, put forward by the authors, is to categorize the developments projects into buckets, such as: *New products*; *Platforms and technology developments*; *Improvements, modifications, and extensions*; and *Costumer requests*. And the point is to use different criteria for each bucket.

There is no one best way to pick projects, so triangulate, is the sixth best practice pointed out by Cooper and Edgett, and is based on recognizing that all methods are

somewhat unreliable, and considering using multiple selection methods in combination.

Another practice suggested by the authors is to *try scorecards, one of the top-rated but overlooked methods.* As it is said, *although scorecards are not the most popular Go/Kill decision tool, they produce surprisingly good results in terms of the resulting portfolio of projects.* Based on the theory that *if you can explain success, then you can predict success*, the gatekeepers' score the project on six to ten key evaluative criteria and the resulting scores are then combined to yield an overall project attractiveness score. *This scoring exercise and final score become key inputs to the Go/Kill decision.* (Cooper & Edgett, 2006).

Use success criteria, too. This eighth practice pointed out, the use of success criteria, is employed with considerable success at firms, such as P&G, and typically include metrics on profitability, first year sales, launch date, and expected interim metrics, such as tests market results. Although this method does have risks, and its use should be reserved for businesses with considerable experience with gating systems, it allows the project team to custom-tailor criteria to suit the nature of its project, and it forces the team to make much more realistic and accurate sales, costs, and time projections, *which provide better data for management to make the Go/Kill decision* (Cooper & Edgett, 2006).

Another practice that leading companies use to improve their project selection method, is to *use the right financial approaches*, suggesting the Productivity Indezz, as an extension of the Net Present Value (NPV). The Productivity Index is a financial approach based on the theory of constraints, and as it is argued, "in order to maximize the value of your portfolio subject to a constraining resource, takes the factor that you are trying to maximize and divide it by your constraining resource." (Cooper & Edgett, 2006). Then the project should be ranked, where those projects at the top of the list are Go projects, are resourced, and accelerated to market. This method is designed to maximize the productivity of a portfolio.

Build in periodic portfolio reviews to force rank your projects, the tenth practice exposed, has the goal to correct the "yea-saying tendency", using portfolio reviews in conjunction with gates. "Portfolio reviews are typically held about four times

per year" (Cooper & Edgett, 2006) , as it is important to ensure that a business has the correct set of Go projects, the right mix and balance of projects, the right priorities and the resources to undertake these Go projects.

4.3. Innovation Success

The success of new products (New Product Success) requires a degree of excellence in three areas stipulated by Perry & Chochet (2009): *(1) Reducing product development cycle time, (2) Increasing product development innovation, and (3) reusing company knowledge assets* (pp.115).

Cycle time or *time-to-market* determines the time it takes a company to recoup its investment in a new product. *Increased product development innovation* determines the extent of a product that consumers can earn and maintain this consumer base. *The ability to reuse knowledge assets* leads us to lower costs in product development, re-creating existing knowledge. (Perry & Chochet, 2009). This way, companies, to succeed in these three areas, should look at the factors that fuel innovation: people, knowledge, and systems.

In the XXI century, the state of innovation has been rocked by market needs even better success rates for new, better and more sustainable. To this end, the practice begins to emerge Product Life Cycle Management (PLM), constituting itself as a key innovation these days.

4.3.1. Managing Product Life Cycle

In order to better understand how Product Life Cycle Management (PLM) has emerged as a key factor for innovation, Perry & Cochet (2009) explore the history of the formulation and design of the product, i.e., how we were creating the tools for managing PLM, investing R&D.

When an organization begins to move forward with the process of formulation and design of a product, the impact will be spreading beyond R & D. Naturally grows the ability to create connections and interactions around a broader set of business functions, such as packaging, design, marketing, and manufacturing, in order to bring a new product to market.

In this way, and now towards a transformation of the enterprises themselves in the direction of PLM, starting by giving value to this discipline as a way to significantly improve its area of product development, these began to raise questions such as: *How good are our processes?; What are our strengths and where are processes underdeveloped?; How does our company compare against the best in our industry?; Which companies excel in organizing their product development resources and what benefits do they get as a result?* (Perry & Cochet, 2009: 118).

In order to respond to many innovation challenges caused by competitive environments, companies had to constantly reduce cycle times and time-to-market, improving the quality and safety of the product and increasing his income, and ensuring that they were offering products that a costumer would buy. Were then developed platforms known as PLM solutions by incorporating complex networks of both point-solutions and collaboration work processes.

The PLM solutions allow the data management of the product since the first steps of idealization, to the end-of-life of product on the market: *The Consumer Packaged Goods (CPG) PLM Platform comprises as many capabilities, applications, and work processes as are found in today's product development processes, functions, and work areas.* (Perry & Cochet, 2009: 119).

The turning point in the evolution and birth of PLM as a discipline occurred when, around a single concept, software suppliers began to build their solutions. The success of PLM is in the Product Data Management (PDM), using a data model called Product Data Record (PDR), as write the authors (2009:120): *Whereas PDM does not have the scope and the capabilities of PLM, it contains the PDR, the building block which "pumps" essential information from and to the different applications composing the PLM platform. PLM is not possible without first creating a single version of the "truth" for all product data through the PDR.*

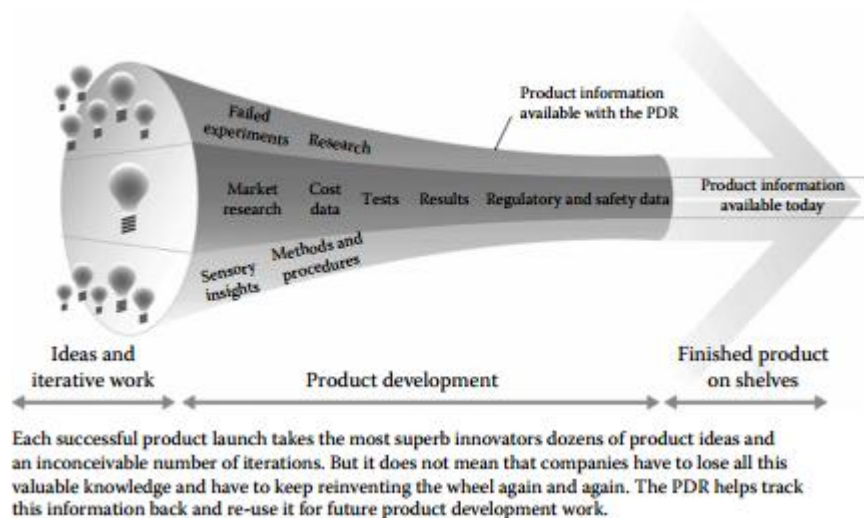### 4.3.2. Product Data Record

If they are guided by a vision and a strategy that will lead to the adoption of a true platform technology, PLM solutions helps solve the challenges of managing product information, and for Consumer Packaged Goods (CPG), the development of a PLM

strategy constitutes as a prerequisite to achieve substantial results, as compared to other industries.

The first step in defining a PLM strategy is to understand, define and map the required data and produced throughout the development lifecycle of the product, which begins with the creation of PDR. The data for development of a product, in addition to consist of the information that defines it, consists also in all the knowledge that was created during its development, from ideation, to launch, through the end-of-life of the product. *(...) the PDR is the heart of PLM, and successful product management is not possible without it". (Perry & Cochet, 2009: 123). Once built, the PDR should be taken as "single version of the truth* (Perry & Cochet, 2009:125) for product data, acting as a reference for all interactions present or future product, organization, processes and work in technology solutions.

The PDR has many benefits and improvements to the different business activities involved in the product development process: Product design; Packaging; Product claims; Traceability; Regulatory, environmental, and safety; Procurement; Project and portfolio management; and Knowledge management, as we can see in Figure 3.

Figure 3 – The types of information available in the PDR

Each successful product launch takes the most superb innovators dozens of product ideas and an inconceivable number of iterations. But it does not mean that companies have to lose all this valuable knowledge and have to keep reinventing the wheel again and again. The PDR helps track this information back and re-use it for future product development work.

Source: Perry, Chip & Max Cochet (2009), "Consumer Packaged Goods Product Development Process in the 21st Century: Product Lifecycle Management Emerges as a Key Innovation Driver", in Moskowitz, Howard R. *et al* (orgs.), *An Integrated Approach to New Food Product Development,* CRC Press.

As we could see, the PDR improves the innovation productivity, and its building and management becomes a prerequisite to PLM initiatives targeted at improving innovation. It contains all critical information necessary to design, produce, and modify the product, defines the product hierarchy (classification and management of product data), it contains linkages to the authoring tools used for the conception and development of a product, and also identifies areas of opportunity to streamline, standardize, and integrate systems and processes to help accelerate speed-to-market, reduce costs, increase knowledge reuse, and guarantee data integrity. (Perry & Cochet, 2009).

In the same line of thought, Steven C. Wheelwright and Sasser W.Earl (1989) show that a map with the corporate managers involved in product development is needed. In order to expose the market and technologies that have been driving the evolution of a company's product line – the "where we've come from" – managers need a way to see the evolution– the "where we are". Such a map provides a basis for sharing information, as was supported by Perry & Cochet (2009), presenting the evolution of current product lines in a summarized and clear way so that all functional areas in the organization can respond to a common vision. "And by enabling managers to compare the assumptions underlying current product lines with the ideal assumptions of new research, it points to new market opportunities and technological challenges." (Wheelwright & Sasser, 1989: 2). As it is argued by the authors, the map generates the right discussions, because when managers know how and why they leveraged products in the past, they know better how to leverage the company in the present.

4.4. Open Innovation: Connect & Develop

Henry Chesbrough (2005) argued that *Open Innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. Open Innovation processes combine internal and external ideas to create value, while defining internal mechanisms to claim some portion of that value*.

Chesbrough describes an innovation paradigm shift from a closed to an open model. In the closed model, the research projects were launched from the science and technology base of the firm, the only one to enter the process, and the only one way to exit the process was

by going into the market. In the Open Innovation model, *projects can be launched from either internal or external technology sources, and new technology can enter into the process at various stages*. Chesbrough labeled this model "open" *because there are many ways for ideas to flow into the process, and many ways for it to flow out into the market* (Chesbrough, 2005).

Figure 4 – Open Vs Close Innovation Paradigm
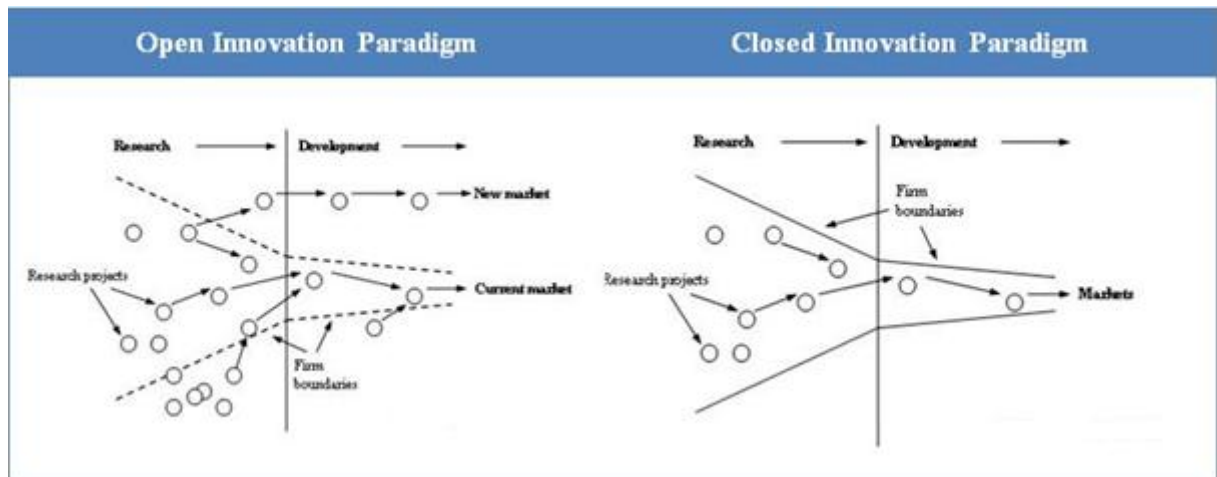
Source: Chesbrough, Henry William (2003), Open Innovation – The New Imperative for Creating And Profiting from Technology, Harvard Business School Press.

Formerly, the launch (inclusion) of a product on the market took too long, which could be as unfavorable to the company that developed, having to deal with investment risk and the consequent internal. But, by applying a fundamentally new approach to innovation, there are several success stories that have been shown feasible to launch a product in a short time and also minimized costs. As an example of this optimization in the development process of new products, the case of the new model of innovation at Procter & Gamble (P&G), which was challenged by its CEO A.G. Lafley, and was advanced and executed by Larry Huston, vice president for innovation and knowledge of P&G, and Nabil Sakkab, vice president for corporate research and development at P&G in Cicinnati.

In their article "*Connect & Develop: Inside Procter & Gamble's New Model for Innovation*" (2006), the authors, to face the challenge from the CEO of reinventing the company's innovation business model, they realized that the best innovations from P&G emerged from the connection and interaction of ideas between internal affairs, and that, similarly, the external connections could also produce innovations highly profitable: *Betting that these connections were the key to future growth, Lafley made it our goal to*

acquire 50% of our innovations outside de company (...) and we needed to change how we defined, and perceived, our R&D organization – from 7,500 people inside to 7,500 plus 1,5 million between them. (Huston & Sakkad, 2006: 2-3).

And so it was that created and developed the innovation model *Connect & Develop* that, with a clear understanding of consumer needs, can identify promising ideas in the world and work them with the R&D department, in order to create better and cheaper products, in a faster and more efficient way.

It is of crucial importance, the analysis, interpretation and proper consideration of this case study for this project, since this innovation model *Connect & Develop*, first developed in the framework of P&G, should be as one of the first guidelines to the entire process of development of new products, in that innovation should be constituted as a key element.

According to the authors, this model works, and through it, parallel to improvements in other aspects of the innovation related to product cost, design and marketing success of the cup innovation more than doubled, while the cost of innovation descended. The productivity of R&D at P&G grew about 60%.

In order to provide a better understanding of the model, which focuses on the lookout for good ideas and bring them to improve and capitalize on internal capabilities of a company, it must realize what to do, where to act, with whom, and how something that came born of an idea.

Firstly, there is a strong collaboration with organizations and individuals around the world, *systematically searching for proven technologies, packages, and products that we can improve (...)* (Huston & Sakkab, 2006:3). At this stage, has proven crucial to the development of work know exactly what we're looking - if we are to meet the primary needs of consumers, if we want to extend the product range with its adjacencies, or whether on the contrary, we intend to enhance the range technologies to better cope with competition.

The *Connect & Develop* strategy is constituted by the activities of global network platforms, and once identified the products and ideas for those networks around the world, we must filter them internally, *using the template that helps organize certain facts about*

the product: What is it? How does it meet our business needs? Are its patents available? (...) (Huston & Sakkab, 2006:6). Likewise, it is necessary to foster a culture change while developing internal systems to create connections, opening the company to external ideas as well as promoting the exchange of ideas internally.

The authors and creators of this model connect and develop, believed in 2006 that this model would become the dominant innovation model in the twenty-first century, and that, to succeed, must be immediately addressed by the CEO of the organization.

Companies need to realize that the innovation landscape has changed and that your current model became untenable. (Huston & Sakkab, 2006).

5. CONCEPTUAL FRAMEWORK OF REFERENCE

Following, the theories and practices studied in the literature review that influenced the method used for data analysis, development and implementation of this project:

- Stage-Gate® - *Doing projects right* and *doing the right projects*: "Many companies now utilize a Stage-Gate® new product process to drive their new-product projects to market quickly and successfully" (Cooper, 2000: 3);
- Portfolio Management;
- Innovation Success – Managing Product Life Cycle and Product Data Record;
- Connect & Develop.

Based on theoretical information and practices collected on these subjects in general, we proceeded to the following:

- Analysis of the development process of new products in the Commercial Department of Perishable Goods;
- Analysis of the average time to launch new products to the market (Idea to Launch);
- Analysis of the number of processes in two support units involved in the process (Quality Control and Product Development);
- Optimization of the development process:
  - o Development of a new flowchart of the process;
  - o Development of a universal database for all units involved in the process;
  - o Development of a sheet for developing products.

6. METHODS AND TECHNIQUES OF DATA COLLECTION

This dissertation follows a methodology with an interpretive paradigm, qualitative, and the method is descriptive and comprehensive, with a strong analytic nature.

All information and data collected for this project was obtained through an internet search in the California Management Review[3], in the Harvard Business Review[4], in the Product Development Institute[5], in the Knowledge Online Library[6], in the Wiley Online Library[7] and through a five month internship conducted in the Product Development Department integrated in the Commercial Department of Perishable Goods of a large retail company in Portugal.

With the aim of optimizing the process of developing its own brand products, it was necessary to study and analyze in detail the whole process and all units within it. It was also necessary to perform analysis trough the internal company database, in order to better understand the efficiency or inefficiency of the process:

- Analysis of the average time for product development in the first quarter of 2012 (from idea to launch);
- Review the number of projects in the first semester of 2012 of two support units integrated in the process (Quality Control and Product Development).

By analyzing all these sources it was possible to obtain relevant and consistent information for the proposed optimization process, presented in this dissertation.

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[3] Available at: http://cmr.berkeley.edu/
[4] Available at: http://hbr.org/
[5] Available at: http://www.prod-dev.com/
[6] Available at: http://www.b-on.pt/
[7] Available at: http://onlinelibrary.wiley.com/

7. INFORMATION ANALYSIS AND CONCLUSIONS

This chapter will present the results of the methodology applied in data analysis.

7.1. Own Brand Product Development Process Analysis

The process of development own brand products responds directly to the Perishable and Food Commercial Departments of this great retail company.

It is a process that involves several entities during its course. It is long and complex, therefore it is necessary to clarify it and the entities involved in it, as well as their responsibilities.

Figure 5 – Development Process Flowchart of Own Brand Products
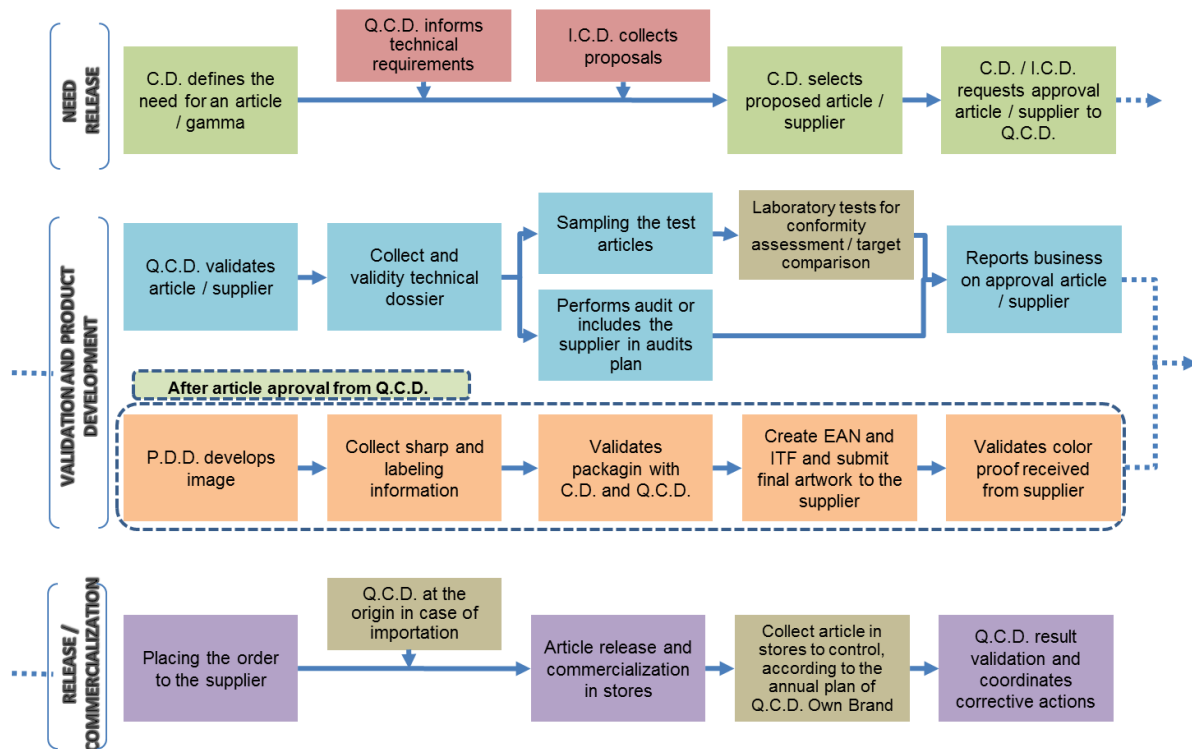
Source: Food Retail Company in Portugal.

Figure 4 demonstrates the process flowchart, which is divided into three phases, each one with several steps that will be analyzed below. Recall that the process that will be analyzed only dates back to the Commercial Department of Perishables Goods.

7.1.1. Need Release

This is the first step of the process of development and launching own brands products.

The process is initiated by the Commercial Department of one of the six Business Units (Butcher, Fish, Delicatessen, Bakery and Confectionery, Fruits and Vegetables, Take-Away). The Commercial Manager is the responsible for this first step, happening when it is determined the need to develop / launch a new product / range to market. This need can be identified in three ways:

- Annual (Planning);
- Spontaneous;
- Punctual.

The main reasons to exist spontaneous and punctual needs are:

- Fight a new product or range of products from the competition;
- Arise an idea of launching a new product or range of products;
- Presentation of a new product or range of products by one Supplier;
- Identification of a better quality product that what is currently being commercialized.

After the need is determined, the Commercial Manager defines the planning for the development / launching of the new product or range.

7.1.1.1. Planning

When identified the need of developing / launching and sourcing own brand products, the Commercial Manager and the Procurement Manager develop a macro planning of procurement actions to develop.

Then the Commercial Manager asks the Quality Control Department, in this case the Quality Technician, about the technical requirements, according to the Quality Management System (QMS) that *provides consistent products that meet the customer requirements* (ISO9001 – International Organization for Standardization).

In order to this process to proceed, the Procurement Manager, which is inserted in the International Commerce Department, needs to be provided of certain information, from the Commercial Manager. This information is:

- Generic technical characteristics;
- Targets;
- Brand positioning;
- Forecast of actual purchase and objective;
- Maximum quantities per package;
- Desired date for product / range launch.

7.1.1.2. Sourcing

After the inputs are received, both from the Commercial Manager or the Quality Technician, the Procurement Manager prepares a micro planning of the sourcing process for the product or range of products.

At this stage the Procurement Manager checks for potential suppliers in its database, as well as possible sources to contact or possible fairs that can be visited, to satisfy the request of the Business Unit.

Identified potential suppliers, the Procurement Manager contact them to proceed the sending of necessary documents to be filled by the Supplier. These documents contain important information concerning the Supplier and the product, certified evidence of certifications held and / or technical information of the products offered.

The Supplier must submit the proposal of the Procurement Manager with all the information requested so that it can be analyzed and compared with other proposals.

There are also requested product samples to be presented to the Commercial Manager for analysis.

7.1.1.3. Proposals Analysis

Based on the information received from a certain number of Suppliers the Procurement Manager analyses which one present the most competitive terms.

After this, it is collected and presented a list of proposed Suppliers to the Commercial Manager. Then, the Commercial Manager evaluates the proposals, comparing them with others who might have in his portfolio. Upon consideration thereof, the Procurement Manager informs about which product(s) / supplier(s) are to be selected.

7.1.2. Validation and Product Development

This second stage of the process is divided into two major stages for the development / launching of the new product / range.

The first step is a responsibility of the Quality Control Department: the information collected about the Supplier and about the product is analyzed, and the product is subjected to sensory and laboratory analysis.

The following step belongs to the Product Development Department, where it will be developed the packaging of the product.

7.1.2.1. Quality Control – Audits and Product Development

According to all information received from the Commercial Manager and the Supplier, the Procurement Manager informs the Quality Technician of the product(s) / supplier(s) selected, sending all documentation available.

The Quality Technician must then analyze and validate all documentation regarding the Supplier and the product, to later proceed the sending of the product sample to the laboratory where they will perform the physical-chemical, microbiological and sensory[8] analysis.

Afterward the obtaining of laboratory results, the Quality Technician decides about the acceptance or rejection of the product sample and reports its feedback to the Commercial Manager and all the Departments involved in the process (Commercial Department, International Commerce Department, Quality Control Department and Product Development Department).

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[8] Although the Commercial Manager has already set a target for the product but this might be changed by the results of the sensory analysis.

In case of product rejection – disapproval –, the Quality Technician will review the situation with both Commercial and Procurement Managers, and later with the Supplier, in order to evaluate the possibility of reformulation of the product, if the Commercial Manager is interested.

If the product is approved, and after receiving the decision of the Commercial Manager, the Procurement Manager informs the Supplier that the product has been approved and that the Quality Technician will contact him, in order to request and developed the necessary technical information to appear in the label. The Brand Manager will also contact the Supplier, to ask for three product samples, the technical drawing (biting packaging), the number of possible colors to print and the type of printing used by the Supplier, in order to proceed with the developing of the packaging.

7.1.2.2.   Brand / Product Development

The Quality Technician is responsible for delivering the technical information about the product – that will appear on the product label –, and the Supplier to send the technical drawing to the Brand Manager, in order to start the process of developing the product packaging.

The Brand Manager shall draw up a briefing for image development, which must be validated by the Commercial Manager. After the approval, the Brand Manager sends the briefing to an external agency or an internal Designer to develop the graphic packaging. When the image development of the product is ready, the Commercial Manager receives the proposed image and analyzes it.

When the Brand Manager considers that the proposal needs improvements, he requests the external agency or the internal Designer to present a new proposal that complies with the intended for the brand. If the proposal is in accordance with the desired by the Brand Manager, and ensure the positioning and image defined for the brand and set by the Graphics Charter, the Brand Manager shares it with the Commercial Manager.

In case the Commercial Manager does not approve the request proposal and suggest image changes, the Brand Manager will need to request those changes to the external agency or to the internal Designer until it is approved.

When approved, the Brand Manager sends the label with the image and text applied to the Quality Technician approval. This may or may not be approved immediately. It is therefore possible to have a mail exchange between, in order to make the necessary changes.

After validation of the label by the Quality Technician, the Brand Manager sends to the Supplier the final document (portable document format – pdf) of the label to be approved.

The Supplier may request changes related to the information contained, and the Quality Technician will then verify whether or not to perform. If the changes are related to the image, the Brand Manager will verify if it is required or not. If the proposal changes are accepted, the Quality Technician and/or the Brand Manager will proceed to the changes and send them again to the Supplier. Otherwise the Supplier sends the final document to the Brand Manager that will create the EAN[9] and the ITF[10] of the product, and asks the external agency or the internal Designer to save the artwork to be sent later to the Supplier.

After sending the artwork, the Supplier shall submit two copies of color proof of the packaging / product to the Brand Manager for review and approval.

When approved the color proof, which is signed and dated by the Brand Manager, the process of image development is completed.

7.1.3. Release / Commercialization

After finishing the process of product development, the Stocks Manager is responsible for carrying out the ordering of products to the Supplier and its entry in the stores.

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[9] EAN – European Article Number – International System for identification of the product (code bar).
[10] ITF – International System/Code to identification of the products shipping box.

7.1.3.1. Monitoring of Suppliers / Products

Despite the development process ends at the time that is presented the final draft of the product and the packaging, the company assumes the responsibility of controlling the Supplier over time, as well as the products.

7.1.3.1.1. Inspection at the origin

For products with origin in foreign countries outside the European Union, there is an inspection at the origin.

The Commercial Division is responsible for identifying if the inspection of quality at the origin is applied to the purchase order or not. However, the Quality Control Department can recommend a reassessment of the decision when appropriate.

When the inspection of quality at the origin takes place, the Quality Control Department is responsible for authorizing the emission of the inspection certificate, evidencing this way the acceptance / compliance of the goods.

7.1.3.2. Promotion Action of the Own Brand

It is the responsibility of the Product Development Department the planning and implementation of actions of Own Brand promotion, always defined in conjunction with the Commercial Department and, whenever possible and appropriate, with the Marketing Department.

7.2. Analysis to the Overall Average Time for Product Development in the 1st Quarter of 2012

After a detailed study of the process of product development, and aiming its optimization, we began by preparing an analysis to the average time to develop own brand products.

Taking into account the three different phases of the process, which were previously presented and shown in figure 4, we started by looking for all own brand products that had been launched in the first quarter of 2012.

Through this list of products, we began to rewind in the process and tried to understand the entry dates of each phase of development. It was here where we faced with one of the biggest obstacles in this process: the monitoring of the development process of a product. Each Department (Commercial, International Commerce, Quality Control and Product Development) had its own database, i.e., none of them were equal and frequently the information was absent or incorrect.

After a long time consuming search in databases of the company, and tracking processes, we were able to understand the precise dates in order to develop the analysis. Graphic 1 shows the average time for product development.

Graphic 1 – Overall Average Time for Product Development in the 1st Quarter of 2012 (in days)
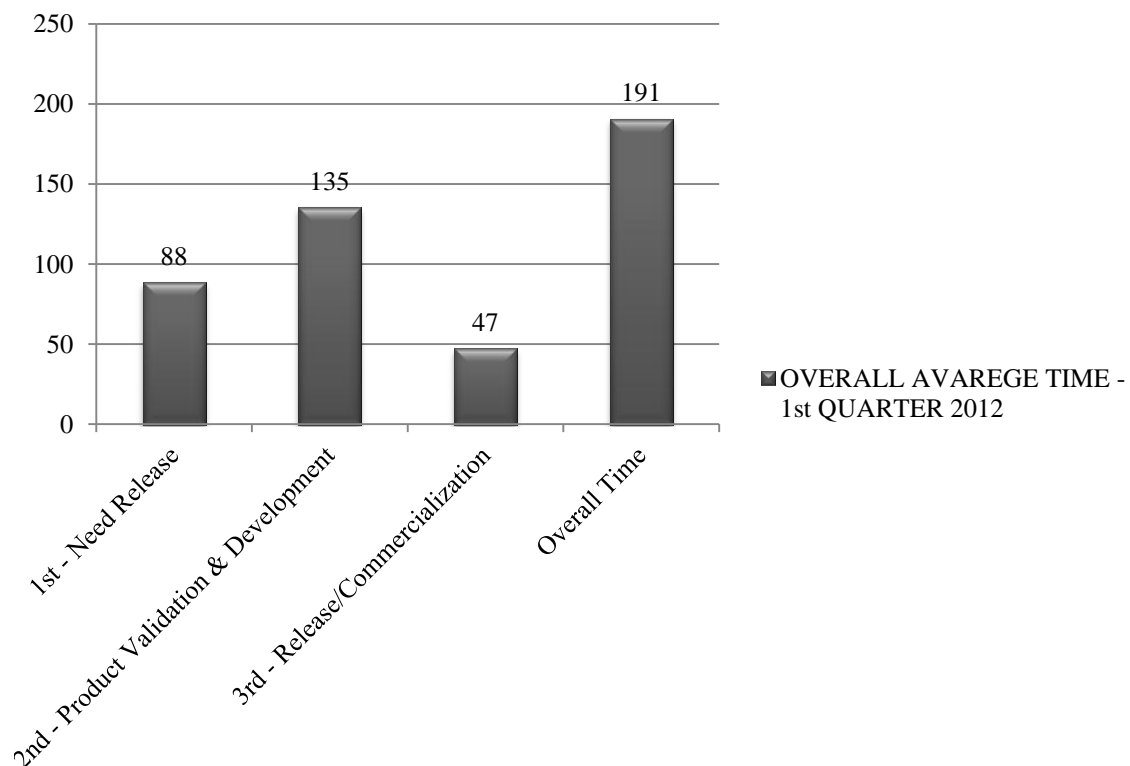
Reaching this data, and after the process analysis, we noticed that it was necessary to analyze in more detail the stage "Product Development & Validation". As discussed earlier in the process, this second stage is divided into three different steps:

- Product Validation, where the products are submitted to some tests;
- Commercial Decision, where the Commercial Department analysis the results from the tests and decides if the product goes to the market or not;
- Product Development, where the development of the packaging starts.

By so, we realized that a detailed analysis would be necessary in order to evaluate precisely the process and define the best strategy to adopt for a better optimization. Graphic 2 illustrates a more detailed analysis.

Graphic 2 – Overall Average Time for Product Development in the 1st Quarter of 2012
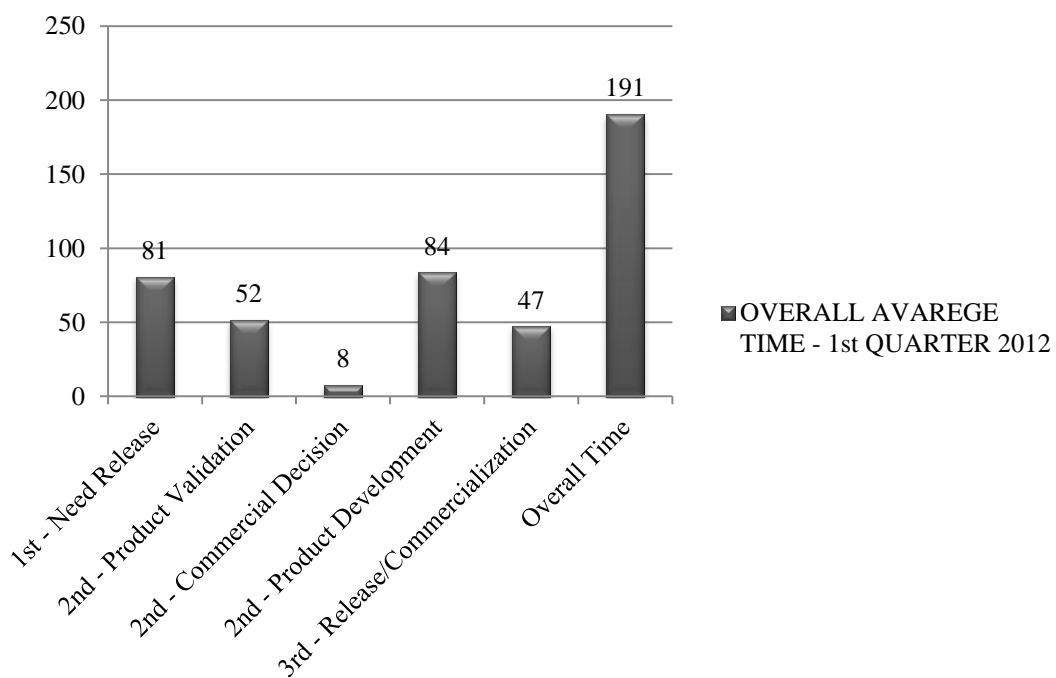
This way, we can analyze that:

- 1st – Need Release takes, in average, 81 days to be concluded;
- 2nd – Product Validation and Development takes, in average, 135 days to be concluded, where:
  - 52 days, in average, for Product Validation;
  - 8 days, in average, for Commercial Decision;
  - 84 days, in average, for Product Development;
- 3rd – Release / Commercialization takes, in average, 47 days.

Following this analysis and a board meeting, we came to consensus that the company is spending too much time in the "Need Release" and in the "Product Development" phases, and the efforts should go through reduce this excess time in order to launch products more quickly to market.

7.3. Analysis of the number of processes in the 1st Semester of 2012

In order to better understand why the company spends so much time during the two phases mentioned before, it was decided an analysis of the departments present in the process.

The following analysis is intended to understand the efficiency of each department on the number of processes responsible for, i.e., notice if the available resources are sufficient for the number of processes.

Due to the use of different databases in each department, we started by studying the Product Development Department, the Quality Control Department and finally the International Commerce Department. However, it was not possible to realize this last one due to the fact that the information contained in the two first departments were not consistent with this last one, inasmuch as the information was inconsistent or probably lost.

By so, following it is presented an analysis to the Quality Control Department, following by the Product Development Department.

Graphic 3 – 2011 Total Processes in Quality Control Department
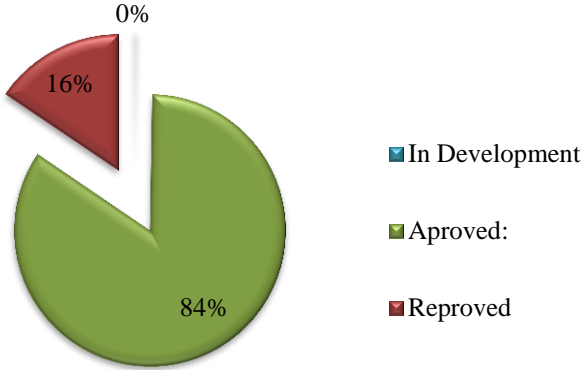
Graphic 4 – 2011 Approved Processes in Quality Control Department

41%

55%

4%

- Followed for image development in 2011
- Followed for image development in 2012
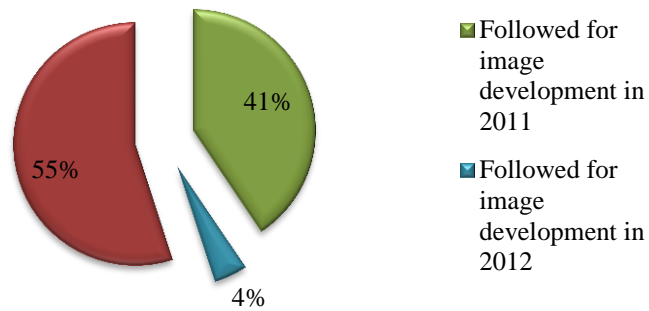
As it can be seen in Graphic 3, in 2011 the number of approved processes, in the Quality Control Department, was 84% and the reproved ones, 16%. Whereas the 84% approved, only 41% followed for image development in 2011, 4% followed for image development in 2012 and 55% didn't followed for image development.

Graphic 5– 1ˢᵗ Semester of 2012 – Total Process in Quality Control Department

4%

31%

65%

- Developing:
- Aproved:
- Reproved
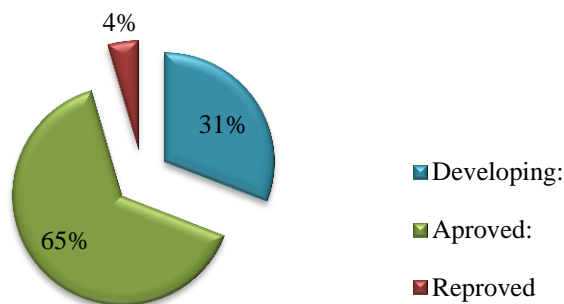
Graphic 6 – 1ˢᵗ Semester of 2012 – Approved Process in Quality Control Department

20%

80%

- Followed for image development
- Not followed yet for image development
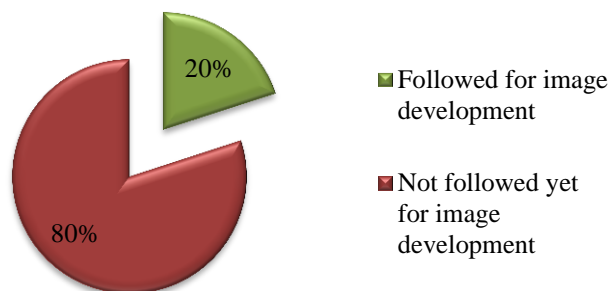
In the 1st Semester of 2012, in the Quality Control Department, 65% of the processes were approved, 31% still in tests and only 4% were reproved. Whereas the 65% of the approved processes, only 20% have already followed for image development and the others 80% don't followed yet for image development.

We can conclude that there are too many processes being approved that don't followed for image development, but the main reason that explains this is the fact that every time we want to develop a new product we receive two or more proposals from different suppliers, and only one of them will be chosen and proceed to image development.

We will now analyze the Product Development Department in order to get more precise conclusions about the efficiency and the number of processes.

Graphic 7 – 1st Semester of 2012 – Product Development Total Processes in Product Development Department
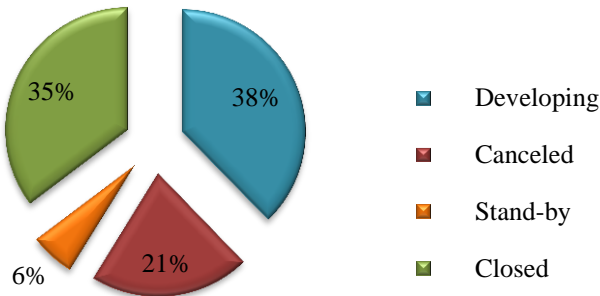
Graphic 8 – 1st Semester of 2012 – Product Development started in 2011 that passed to 2012 in Product Development Department
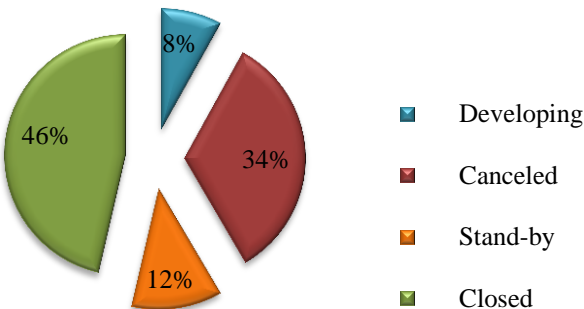
Graphic 9 – 1st Semester of 2012 – Product Development started in 2012 in Product Development Department
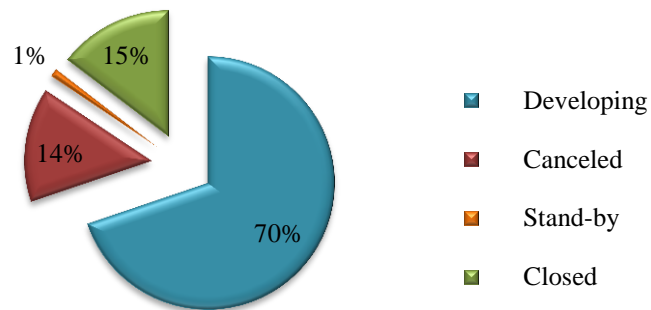
As we can see in the last three pie charts, in the 1st Semester of 2012, 38% of the processes were still being developed, 21% were canceled, 6% in stand-by and 35% were already closed (finished).

This data means not so good news, due to the number of processes that were canceled or were in stand-by, so we divide it in two, in order to best understand the data information.

The processes that started in 2011 and passed to 2012, which 8% still in developing, 34% were canceled, 12% are in stand-by and 46% were closed, and the processes that started in 2012, which 70% are in developing, 14% were canceled, 1% in stand-by and 15% already closed.

This means that the number of processes being canceled in the last phase of the development process is too high, being spent too many resources in products that do not reach the market. Besides, this department does not lead only with the development of new products. The people working in this department are also responsible for the alteration of products / suppliers and renovations of products, as you can see in the next pie charts.

Graphic 10 – 1st Semester of 2012 – Product / Supplier Alteration in Product Development Department

43%

57%

0%

0%

- Developing
- Canceled
- Stand-by
- Closed
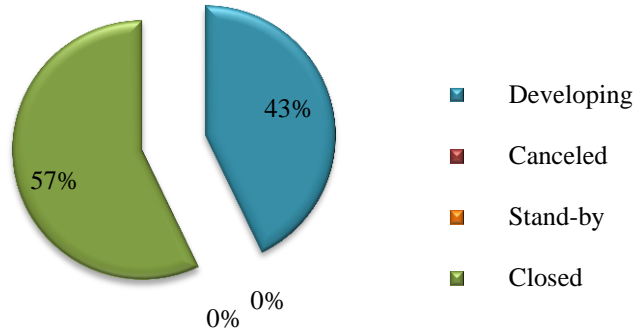
Graphic 11 – Product / Supplier Alteration in 2011 that passed to 2012 in Product Development Department

0%

0%

0%

100%

- Developing
- Canceled
- Stand-by
- Closed
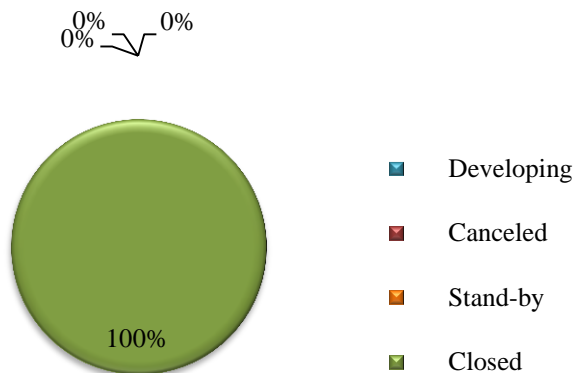
Graphic 12 – Product / Supplier Alteration stated in the 1st Semester of 2012 in Product Development Department

45%

55%

0%

0%

- Developing
- Canceled
- Stand-by
- Closed
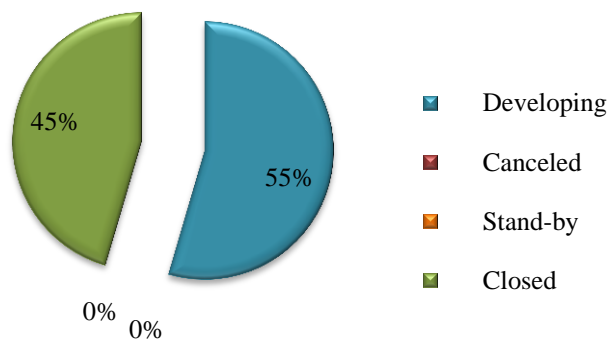
Considering the product / supplier modification in the 1st Semester of 2012, 57% were closed and 43% still in developing.

The ones started in 2011 that passed to 2012, all of them were closed (finished) and the ones started in the 1st Semester of 2012, 55% still in developing and 45% are already closed.

Now let's see the renovations pie charts.

Graphic 13 – Renovations in the 1st Semester of 2012 in Product Development Department
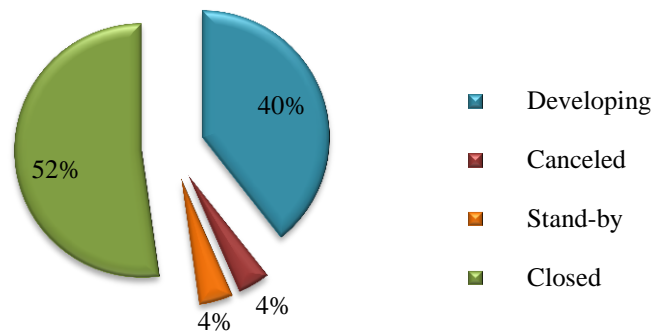
Graphic 14 – Renovations started in 2011 that passed to 2012 in Product Development Department
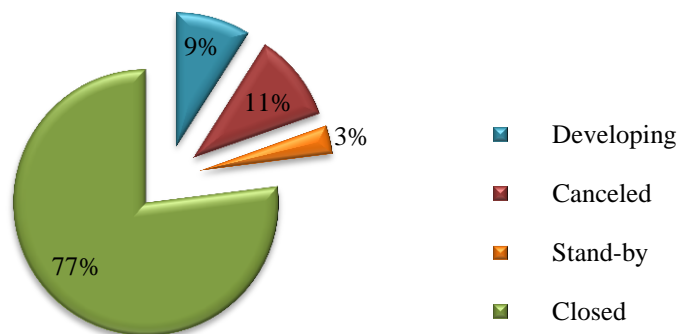
Graphic 15 – Renovations started in the 1st Semester of 2012 in Product Development Department
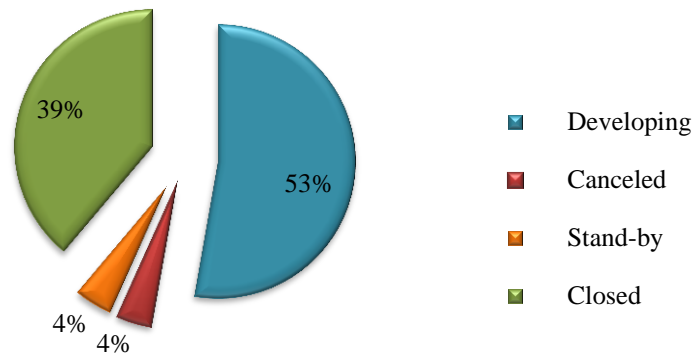
Considering the renovations in the 1st Semester of 2012, 40% still in developing, 4% were canceled, 4% in stand-by and 52% were closed.

The ones started in 2011 that passed to 2012, 9% still in developing, 11% were canceled, 3% in stand-by and 77% were closed. The ones started in the 1st Semester of 2012, 53% are in developing, 4% were canceled, 4% are in stand-by and 39% are already closed.

We can conclude that, being this department in the last phase of the development process, there are too many processes being canceled or in stand-by. This way, the resources of the company are focused in processes that they don't have 100% shore that will reach the market place. The company should manage its best resources in order to launch the right projects and doing them right.

8. METHODS OF IMPLEMENTATION

As Dr. Robert G. Cooper argues, there are two ways for companies to win in product innovation*: doing projects right and doing the right projects* (Cooper, 2000).

As mentioned in the literature review, the Stage-Gate® new product process drives new-product projects to market quickly and successfully. It is a conceptual and operational road map for moving a new-product project from idea to launch, improving effectiveness and efficiency, and breaking the innovation process into a predetermined set of stages. At the entrance to each stage there is a gate, which serves as the quality control and Go/Kill check point in the process (Cooper, 2000).

Portfolio management defines the right new product strategy for the firm, selects winning new product projects and achieves the ideal balance of projects (Cooper, 2000).

The PLM solution allows the data management of the product since the first steps of idealization, to the end-of-life of product on the market. The success of PLM is in the Product Data Management (PDM), using a data model called Product Data Record (PDR), as argued the authors (2009:120): *Whereas PDM does not have the scope and the capabilities of PLM, it contains the PDR, the building block which "pumps" essential information from and to the different applications composing the PLM platform. PLM is not possible without first creating a single version of the "truth" for all product data through the PDR.*

PLM solutions helps solve the challenges of managing product information, and for Consumer Packaged Goods (CPG), the development of a PLM strategy constitutes as a prerequisite to achieve substantial results, as compared to other industries.

The Connect & Develop innovation model emerged from the connection and interaction of ideas between internal affairs, and that, similarly, the external connections could also produce innovations highly profitable.

Applying and implementing all this information, we started by developing a new process flowchart (Annex 11.10), a new form for every new product / range launch, called "The Product File – Fact Sheet Release" (Annex 11.11), and a new database in order to manage the product process since the first steps until the end-of-life (Annex 11.12).

Using Stage Gate® method and its key stages, we will now explain how this new process works, how the new sheet and the new database will influence the company productivity.

8.1. New flowchart process operation

Based on the current process, explained in the last chapter, and applying the concepts discussed in the literature review, the process morphed into a new process of development own brand products.

As we can see in annex 11.10, the process of launching a new product can start from an idea that can be from inside the company (collaborators) or outside the company (consumers or suppliers). This new flowchart of the process has eight gates (decisions points), two where the process of developing a new product can be killed or not, and other six where the process must backtrack or not, until it is conform to the desired.

The first gate is used to filter the good ideas of launching a new product from those that are medians or bad ideas. If it is a good idea the process proceeds to the second gate, the search for Suppliers. If there are Suppliers the process proceeds, otherwise the process stays in stand-by or dies.

The next gates serve only to control. Every time the process proceed, will obligatorily pass by six control processes, wherein, if the product meets the desired requirement, the process proceeds otherwise the process returns back to another gate decision.

This new process has also six new stages that lead to the fulfillment of a mandatory sheet, called "The Product File – Fact Sheet Release", that will be explained next. This way we can be able to filter the number of processes in development, selecting only the best ones and achieve a balance between the numbers of processes in development with the company's resources.

8.2. The Product File – Fact Sheet Release

In order to create a good portfolio management, we created a mandatory sheet (Annex 11.11) that has to be filled while the process is running. This sheet collects all the information of the development and launching of a new product / range, divided by six different phases:

1. Idea Screening: It serves to expose the idea of launching a new product / range. The person who generates the idea begins to fill basic information, the name, date, the department which it belongs, which business unit and brand where the product / range will be inserted. From then, he fills the information about the new product / range, the product description, objective / need release (objective, range, segment and target), requirements (product characteristics, grammage, packaging and label) and examples of similar products / ranges both nationally and internationally.

2. Commercial Management: It serves to inquire the idea. It is up to the Commercial Manager, from the business unit previously identified, to examine the idea that was proposed and draft an expected launch (Purchase Price, Sell Price, Profitability, Sales quantity and value). If the Commercial Manager approves the idea, characterizes the urgency of launching and predicts a launch date of the product / range.
   This way the company has the ability to move forward good projects to market quickly. Characterizing the urgency of the launch, this can get ahead of projects that have less urgency during the development phase.

3. Quality Control: Used to record the results from the analysis of the product. The Quality Technician must identify which analysis have been done to the product, approve or not the product, record the result of the hedonic scale and the labeling information to include in the package.

4. Product Development: Serves to prepare the briefing of the new product / range. The Brand Manager must fill the packaging description (type, print type and biting), exposure package (linear exhibition and faces that are ahead), elements / information to be included on the label (text and other), Image (Intended picture and existing range in commercialization), the budget and the final photo of the product / range.

5. <u>Communication Plan:</u> Serves to develop a communication plan. It is up to the Commercial Manager and Brand Manager to develop an integrated communication plan for the new product / range. Filling information as the framework, campaigns already performed, competition, objectives, message, target, media, release date, the campaign budget and evaluation metrics.

6. <u>Product Life Cycle Management:</u> Designed to do a profitability analysis. It is up to the Procurement Manager to make a quarterly profitability analysis of the new product / range filling information such as purchase price, sell price, profitability and sales (quantity and value).

   This way we can track product profitability over time and make a life cycle management of the product.

When we enter into the new database, that is going to be explained next, we will see a list with all the developed and developing processes. If we click twice over the process that we want to analyze, this sheet will appear and we will be able to see all the information about the process.

8.3. Database

Given the fact that the company does not have a database that could be used and shared by all teams, and in which all the information should be registered for each product developed, we proceeded to the establishment of a share point database.

Through the analysis of the different databases used, we proceeded to the development of a prototype to be developed by the Information Technology Department. This prototype, made from the new flowchart, will register all dates of each step of the new process and set timings for each of them, this way it is possible to follow the entire process of developing a new product / range and make the process faster.

The database acts like an excel sheet. Each line will be an ongoing process and each column is the information that is being filled since the approval of the idea until it is in commercialization. When we click twice over the process that we want to analyze, the product file, fact sheet release, will appear.

Every time that a process proceeds to development, the Procurement Manager is responsible for opening the process in this new database and fill the product information.

Then, as the process moves forward, will be filled by the person responsible for each step, as we can see in table 1.

Table 1 – Data base information

Product / Range Description	Commercial Department	Quality Control Department	Product Development Department	Supply and Inventory Department	Supplier
Source	1st – Need Approval?				
Process Type	2nd – Suppliers?				
Commercial Department Description		Sample Request.			Sample Reception.
Business Unit Description		Internal Sensory Test.			
SKU	3rd – Internal Sensory Test Results Approval?	Product Information and Sample Request.			Product Information and Sample Reception.
EAN		4th – Product Information and Samples Approval?			
Need Type	5th – Confirmation?	Send Product Information.	Biting Request.		Biting Reception.
Product Need			Image Development.		
Urgency	6th – Image Approval?	Product Information Approval.	Send PDF.		7th – PDF Approval.
Brand Type			Send Final Art.		Color Proof Reception.
Brand			8th – Color Proof Approval?		
Product Name Proposed (Retek Description)			Communication Plan.		
Supplier				Purchase Order.	Reception Order.
Supplier Code (RMS)				Commercialization.	
Supplier Code (PCI)					

Setting timings for each step of the process, in order to launch products faster into the market, we can obtain an overall timing of the process of launching new products, both for products produced in Portugal as for products built in foreign countries.

Graphic 16 and graphic 17 shows the time of launching new products by setting timings for each stage of the process.

Graphic 16 – National
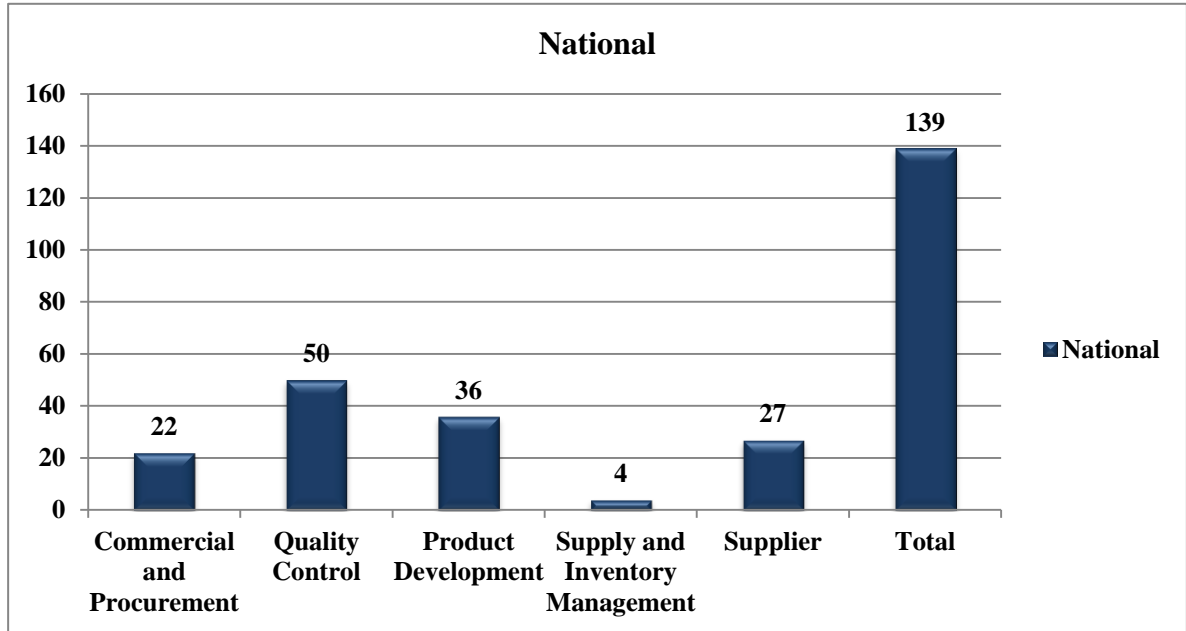
Graphic 17 – International
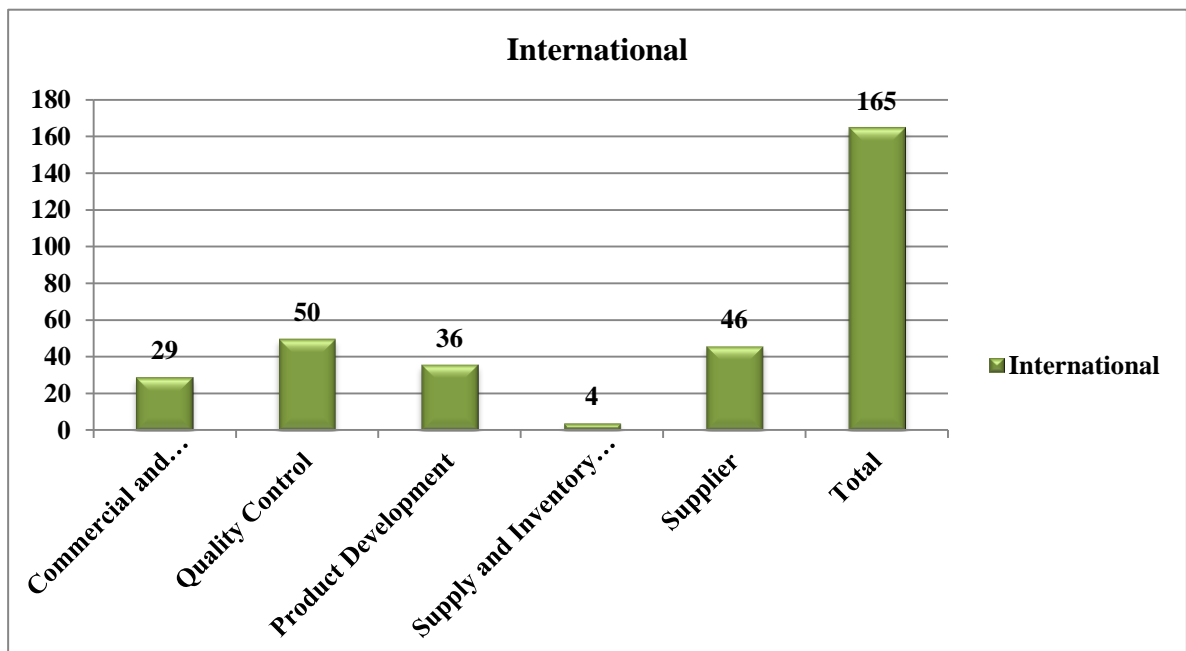
For national products is predicted a development time of 139 days and for international products is predicted a development time of 165 days.

9. CONCLUSIONS

Through a traineeship held in a large retail company in Portugal, we proceeded to draw up a plan to optimize the process of developing and launching new own brand products.

Through the elaborated analysis, were immediately detected flaws in the organizational structure of the company, including the use of different databases by different interveners in the process mentioned above. The fact that the information is not shared on a single database means that there is an unnecessary waste of time for all interveners in the process of finding information available in other departments. We conclude that the average time to launch new products was too long, especially in the first two phases, Need Release and Product Development, which led to a prolonged period of time to launch products on the market. In the same way, it was concluded that the number of processes in development appeared to be excessive for the available resources of the company, and that many of these processes were canceled during the development phase, i.e., time and money were wasted on developing products that would not be released to the market.

To optimize this process, we developed a new flowchart based on the Stage Gate ® model, in order to filter the number of processes in development, and created a new database, so information can be shared by all entities. Also, it was launched an innovative product sheet, in order to record all steps by which a product passes along its development process.

With the development of a new database, the process of developing new products can be followed since the idea is approved until being in market. The timings for implementing each step of the process are an effective result that the process becomes faster and therefore the release of the products will also be faster. Furthermore, all teams present in the process can have a shared database, facilitating the work and the communication between them.

The product file – fact sheet release – of launching new products will facilitate the management of the product lifecycle and also create a portfolio database, so that in the future the company can get answers to questions which are initiated by the development of a product that is in commercialization and get new ideas for the development of new products.

Through the creation of this new process, and to eliminate the failures of the existing previously, we believe that we have positively contributed in this area of development of this large retail company. We also believe that after the implementation of this process, both this

company as any in the business will see a decrease in the losses regarding to products that end up not being launched in the market, and a proportional increase in profit, as the database is fed by all teams, without there being a loss of time and information that which prevailed.

We conclude that this is an essential process to this type of market, making this research both relevant and successful as it addressed the problem and discovered its flaws, and successfully found an effective solution to solve and to optimize the process in question.

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11. ATTACHMENTS

11.1.   TOP 25 - Turnover (€ Million) - Portugal

		2010	2009	2010 vs 2009
1	SONAE	5.203	5.006	4%
2	pingo doce	3.453	3.112	11%
3	Auchan	1.601	1.501	7%
4	Lidl	1.199	1.211	-1%
5	minipreco	903	897	1%
6	El Corte Inglés	482	470	3%
7	fnac	360	339	6%
8	IKEA	333	301	10%
9	LEROY MERLIN	220	159	38%
10	AKI	192	182	6%
11	STAPLES	190	190	0%
12	Media Markt	182	194	-6%
13	Moviflor	182	170	7%
14	DECATHLON	162	133	22%
15	lfp	145	135	7%
16	C&A	136	158	-14%
17	Massimo Dutti	92	87	6%
18	TOYS R US	50	53	-5%
19	PontoFresco	49	49	1%
20	LA REDOUTE	45	47	-3%
21	Salsa	43	45	-4%
22	Cortefiana	42	40	3%
23	GANT	34	34	-1%
24	Norauto	33	28	20%
25	QUEBRAMAR	30	29	3%

Source: Ranking APDE Aug/Sept 2011.

11.2. TOP 10 Food Turnover (€ Million) – Portugal

		2010	2009	2010 vs 2009
1	CONTINENTE	3.555	3.380	5%
2	pingo doce	3.453	3.112	11%
3	Auchan	1.601	1.501	7%
4	Lidl	1.199	1.211	-1%
5	minipreco	903	897	1%
6	PontoFresco	49	49	1%
7	Apolónia	30	30	-2%
8	superSOL	11	16	-35%
9	NOVO HORIZONTE	7	8	-11%
10	SELECÇÃO	3	3	2%

Source: Ranking APDE Aug/Sept 2011.

11.3. TOP 15 Non-Food Turnover (€ Million) – Portugal

		2010	2009	2010 vs 2009
1	worten	765	703	9%
2	El Corte Inglés	482	470	3%
3	fnac	360	339	6%
4	IKEA	333	301	10%
5	SPORT ZONE	229	221	4%
6	LEROY MERLIN	220	159	38%
7	AKI	192	182	6%
8	STAPLES	190	190	0%
9	Media Markt	182	194	-6%
10	Moviflor	182	170	7%
11	DECATHLON	162	133	22%
12	modalfa	150	138	9%
13	lfp	145	135	7%
14	C&A	136	158	-14%
15	Massimo Dutti	92	87	6%

Source: Ranking APDE Aug/Sept 2011

11.4. Overall Average Time for Product Development in the 1st Quarter of 2012 (in days)

	1st – NEED RELEASE	2nd – PRODUCT VALIDATION & DEVELOPMENT	3rd – RELEASE / COMMERCIALIZATION	OVERALL TIME
OVERALL AVAREGE TIME - BUTCHER	51	120	83	205
OVERALL AVAREGE TIME - FISH	101	119	38	159
OVERALL AVAREGE TIME - DELICATESSEN	43	146	26	184
OVERALL AVAREGE TIME - BAKERY & CONFECTIONERY	245	260	17	297
OVERALL AVAREGE TIME - FRUITS & VEGETABLES	3	33	74	108
OVERALL AVAREGE TIME - 1st QUARTER 2012	88	135	47	191

11.5. Overall Average Time for Product Development in the 1st Quarter of 2012 (in days)

	1st - NEED RELEASE	2nd – PRODUCT VALIDATION	2nd – COMMERCAIL DECISON	2nd – PRODUCT DEVELOPMENT	3rd – RELEASE / COMMERCIALIZATION	OVERALL TIME
OVERALL AVAREGE TIME - BUTCHER	49	86	2	34	83	205
OVERALL AVAREGE TIME - FISH	98	43	3	77	38	159
OVERALL AVAREGE TIME - DELICATESSEN	30	48	13	98	26	184
OVERALL AVAREGE TIME - BAKERY & CONFECTIONERY	225	78	21	182	17	297
OVERALL AVAREGE TIME - FRUITS & VEGETABLES	2	4	1	29	74	108
OVERALL AVAREGE TIME - 1st QUARTER 2012	81	52	8	84	47	191

11.6.   2011 & 2012 Total Processes in Quality Control Department

Business Unit	Butcher	Fish	Delicatessen	Bakery & Confectionery	Fruits & Vegetables	Take-Away	Overall
Total Number of Processes in 2011	**58**	**87**	**174**	**115**	**207**	**114**	**755**
In Development	0	0	2	0	0	0	2
Aproved:	54	76	136	104	177	88	635
Followed for image development in 2011	16	50	65	68	41	18	258
Followed for image development in 2012	7	2	13	4	1	1	28
Don't followed for image development	31	24	58	32	135	69	349
Reproved	4	11	35	11	30	26	117
Total Number of Processes in 2012	**16**	**18**	**24**	**52**	**57**	**11**	**178**
Developing:	8	6	9	22	10	0	55
Aproved:	8	12	14	29	41	11	115
Followed for image development	0	1	10	0	3	9	23
Not followed yet for image development	8	11	4	29	38	2	92
Reproved	0	0	1	1	6	0	8

11.7.   1st Semester of 2012 – Product Development Total Processes in Product Development Department

|	Butcher	Fish	Delicatessen	Bakery & Confectinery	Fruits & Vegetables	Take-Away	Overall
Total Processes in 2012	81	32	95	97	419	23	478
Product Development/Innovation:	43	27	66	31	26	11	204
Developing	9	8	33	8	8	11	77
Canceled	20	0	7	2	14	0	43
Stand-by	1	3	2	6	0	0	12
Closed	13	16	24	15	4	0	72
Amendment Product / Supplier:	2	3	7	6	0	10	28
Developing	0	1	5	0	0	6	12
Canceled	0	0	0	0	0	0	0
Stand-by	0	0	0	0	0	0	0
Closed	2	2	2	6	0	4	16
Renovation:	36	2	22	60	393	2	515
Developing	0	2	14	50	135	2	203
Canceled	6	0	0	1	14	0	21
Stand-by	1	0	0	0	21	0	22
Closed	29	0	8	9	223	0	269

11.8.   Product Development started in 2011 that passed to 2012 in Product Development Department

	Butcher	Fish	Delicatessen	Bakery & Confectinery	Fruits & Vegetables	Take-Away	Overall
Processes started in 2011 that passed to 2012:	66	18	35	49	101	40	309
Product Development/Innovation:	32	17	27	28	4	17	125
Developing	0	1	4	5	0	0	10
Canceled	18	0	5	2	4	13	42
Stand-by	1	3	1	6	0	4	15
Closed	13	13	17	15	0	0	58
Amendment Product / Supplier:	0	1	1	4	0	0	6
Developing	0	0	0	0	0	0	0
Canceled	0	0	0	0	0	0	0
Stand-by	0	0	0	0	0	0	0
Closed	0	1	1	4	0	0	6
Renovation:	34	0	7	17	97	23	178
Developing	0	0	3	10	0	3	16
Canceled	6	0	0	1	0	12	19
Stand-by	1	0	0	0	5	0	6
Closed	27	0	4	6	92	8	137

11.9.   Product Development started in 2012 in Product Development Department

	Butcher	Fish	Delicatessen	Bakery & Confectinery	Fruits & Vegetables	Take-Away	Overall
Processes started in 2012:	15	14	60	48	318	23	478
Product Development/Innovation:	11	10	39	3	22	11	96
Developing	9	7	29	3	8	11	67
Canceled	2	0	2	0	10	0	14
Stand-by	0	0	1	0	0	0	1
Closed	0	3	7	0	4	0	14
Amendment Product / Supplier:	2	2	6	2	0	10	22
Developing	0	1	5	0	0	6	12
Canceled	0	0	0	0	0	0	0
Stand-by	0	0	0	0	0	0	0
Closed	2	1	1	2	0	4	10
Renovation:	2	2	15	43	296	2	360
Developing	0	2	11	40	135	2	190
Canceled	0	0	0	0	14	0	14
Stand-by	0	0	0	0	16	0	16
Closed	2	0	4	3	131	0	140

11.10.   New flowchart of the process
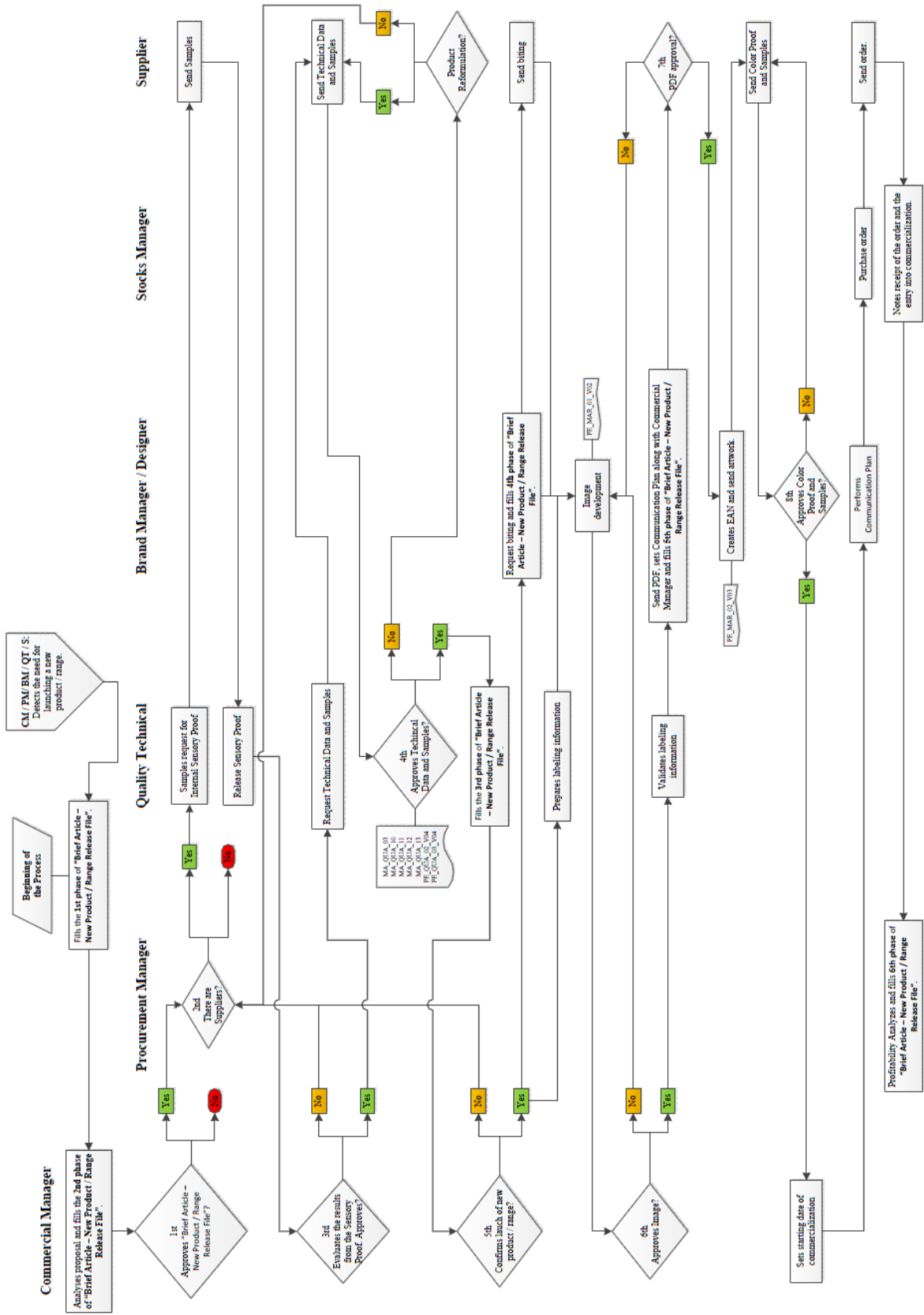
11.11. The Product File – Fact Sheet Release

Perishable Commercial Department

The Product File – Fact Sheet Release of new Product / Range

1st Phase – Idea Screening

Name / Function		Date	

Department:		Business Unit:		Brand:	
Administration		Butcher		1	
Commercial Department		Fish		2	
International Commerce Department		Delicatessen		3	
Product Development Department		Bakery & Confectionery		4	
Quality Control Department		Fruits & Vegetables		5	
Supplier		Take-Away		6	
				7	

Product Description:

Product Designation	

Objective / Need Release	Objective:
	Range:
	Segment:
	Target:

Requirements	Product characteristics:
	Grammage:
	Packaging:
	Label:

Example of similar Product / Range (Benchmarking):	
National (Imagens)	
International (Imagens)	

2nd Phase – Commercial Management

Commercial Manager

Name		Date	

Prevision	Values / Units (Annual)
• Purchase Price	€
• Sell Price	€
• Profitability (SP/PP)	%
• Sales (Quantity)	Uni.
• Sales (Value)	€

Approval	Yes		No	
	ⓥ		⊘	

Urgency (Commercial Manager):	▨
1) High	
2) Medium	
3) Low	

Forecast Release (Date)	

Comments	

3rd Phase – Quality Control

Quality Technical:

Name		Date	

Analysed Characteristics				
Organoleptic	Yes		No	
Physico-Chemical	Yes		No	
Microbiological	Yes		No	
Performance Test	Yes		No	
Sensory Analysis	Yes		No	

Approval	Yes		No	

Hedonic Scale Result	

Comments	
Labelling information	

4th Phase – Product Development

Brand Manager

Name		Date	

Packaging description	
Package type (Ex: Tetra, Card, Film, etc.)	
Number of Colours	
Print type	
Biting	

Exposure package	
Linear exhibition	
Faces that are ahead	

Elements / Information to be included on the label	
Texts	
Other	

Image	
Intended picture	
Existing range in commercialization (Images)	

New Concept		Existing Range	

Budget	

Time Frame		
Action	Response	Timing
Briefing		
Submission of Proposal		

Final photo of the product / range	

5th Phase – Communication Plan

Commercial Manager and Brand Manager

Integrated Communication Plan

Framework	How are sales in the range?
	What is the relevance of the product / range launch?
	What are the expectations?
	New flavor?
	Unique product in the market?
	Feature that distinguishes it?
Campaigns already performed	Has already been done campaigns for similar products / ranges?
Competition	Has competition?
	Makes the difference?
Objectives	Increase sales?
	Make known?
	Give to prove?
	Increase awareness?
	Innovation?
	Fighting competition?
Message	Healthy?
	Flavor?
	Innovative?
	Socializing moments?
	Special occasions?
	Superior quality?
	Tradition?
	Origin?
Target	
Media	**Personal Communication:** • Personal Selling: Phone, email, face-to-face, person-to-audience;

	• Direct Marketing: Phone, email, face-to-face, TV direct response, Online Marketing. (Good tool for building a customer database). **Non-Personal Communication:** • Public Relations: Meetings (formal and informal), Events, Public Service Activities (Corporate Social Responsibility), Sponsorship, Advertising; • Sales Promotion: Prince discount, Quantity discount (pay 1 take 2; buy product x and offer product y), Samples, Coupons. • Publicity: TV, Cinema, Radio, Print (Newspapers, Magazines), Brochures, Outdoors, Shop (Tasting, Signage), Events, Flash Mobs, Internet (Online, Social channels), email.
Release date and timings desired in store	
Budget	
Campaign metrics evaluation	

6th Phase – Product Life Cycle Management

Procurement Manager

Name		Date	

Order Date	
Commercialization Date	

Analysis / Month	3rd	6th	9th	12th	18th	24th	36th
Purchase Price	€	€	€	€	€	€	€
Sell Price	€	€	€	€	€	€	€
Profitability (SP/PP)							
Sales (Quantity)	Uni.	Uni.	Uni.	Uni.	Uni.	Uni.	Uni.
Sales (Value)	€	€	€	€	€	€	€