BUSINESS STRATEGY, MARKETING STRATEGY AND MANUFACTURING STRATEGY: AN OVERALL ALIGNMENT

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LIU-IEI-TEK-A--08/00308--SE
A mis padres, por estar tan cerca estando tan lejos y mil razones más.
ABSTRACT

Strategy formulation involves deciding on future activities and investments. Every function within the firm formulates its strategy, arising conflicts due to the different goals they may choose. This conflicts or misalignment imply a global sub-optimization of the business unit. In this thesis, the two functions considered critical to be aligned with the overall business strategy are marketing and manufacturing. The literature has studied all these linkages but not simultaneously, which was the main goal of this work. A model that covers these areas is provided to graphically show the relationships between business strategy, marketing strategy and manufacturing strategy, as well as to point out where the product is in this whole network of connections.

To achieve the overall alignment, a corporate debate has to be enhanced to make possible a business strategy that considers not only the market opportunities but also the firm’s capabilities. But this is not enough; actually, it is just the first step. After that, congruence between marketing and manufacturing must be attained. The main reason for the uncoordinated goals between these two functions is the evaluation or rewarding system of their managers. Manufacturing managers are usually evaluated in terms of cost reduction and marketing managers by sales attained, even when the business strategy is differentiation.

In order to get these two functional strategies into alignment it is required a consensus in the trade-offs involved. To help in the discussion, the product design function is important because it brings the product features as a framework and also because approximately 80% of the trade-offs for the product attributes are faced during the design phase. Some solutions for the conflicts arisen include: cross-functional teams for the strategies formulation, the enhancement of managers’ technical background, the use of interface variables like Total Quality management to create common objectives, and a common reward system according to the overall profits.

In the case study, it was been presented the sequential approach used for the strategy formulation in BT/Toyota Europe where the alignment is based on a debate centred around the market and the product.

In conclusion, this thesis has provided some tools that managers can use in combination with dialogue and their own experience in order to come with the alignment necessary for a successful strategy.
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1 - INTRODUCTION

1.1 – Background

The final objective of any profit organization is achieving the maximum possible profit. Thus businesses have to induce the customers to buy their products and services by offering them what they need better than competitors do.

Globalization has increased the competition intensity, forcing the companies to compete with businesses all over the world. Besides, new technologies and benchmarking have brought the firms to the maximum level of effectiveness. These two conditions make essential a strategy that helps the firms to differentiate their activities from the competitors’.

When formulating a strategy, activities and investments are decided. Usually these decisions are done separately in the different functions of the firm, arising conflicts among them because of uncoordinated goals. That is why functional investments must be aligned, so they all pull in the same direction for a better performance of the business. Especially critical is the linkage between marketing and manufacturing strategies and their linkage with the mainstream strategy. All these alignments between strategies have been widely studied in the literature, but always in pairs, and not simultaneously.

Moreover, the strategic role of manufacturing has been emphasized by most of authors but this recognition seems to be generally kept to a theoretical level, while in practise, in many companies, manufacturing is still seen as a reactive function. Manufacturing managers just focus on daily activities, seeking effectiveness, and they do not play their strategic role. Managers’ short term performance obsession makes most of firms believe that the acronyms in fashion (TQM, JIT, TOC…) are the panacea for all their problems. However, all these improvement programs have no sense if they have not a strategic direction behind to match them with the activities and resources of the company. Therefore, it is extremely important to promote the strategic role of manufacturing in the “real world”.

1.2 - Objectives

Because of the reasons introduced in the previous section, the purpose of this thesis is to help to reduce the existing gap in the literature about the simultaneously alignment of the key strategies as well as to bring the theory closer to the companies.
Thus the objectives to be reached are the following ones:

- Study the alignment between business strategy, marketing strategy and manufacturing strategy in pairs.
- Study the role of the product design in the alignment discussion.
- Search for a general framework that companies can really use.
- Provide some ideas for the overall match and some recommendations for managers and researchers.

It is worth to be mentioned that, because of the limited scope of this work, just manufacturing and marketing strategies will be considered; although in a company other functional strategies may be taken into account. Product design strategy will be also studied but only as a mediator between these two strategies since it is not an objective of this thesis to analyze its alignment with business strategy or other functions.

1.3 - Method

The methodology used in the thesis and in the report will consist on basically five steps.

The first step will cover a description of what strategy is as well as an introduction and analysis of the relevant elements that compose each strategy considered. Then, the existing approaches to achieve alignment between the strategies, in pairs, will be presented. From the literature review of such approaches several models that summarize the relationships between strategies will be created.

The third step will be based on the analysis of the role of product design strategy in the alignment between marketing and manufacturing strategies and the introduction of the final model, which simultaneously covers the three areas of study.

After that, a case study of a real company will be analyzed, which includes carrying out some interviews with the managers responsible for the strategies in this company.

All these previous steps will allow approaching the final part, consisting on providing the conclusions and suggestions concerned with the objectives already mentioned.
2 - WHAT IS STRATEGY?

*Strategy* has its origins in the Greek word “*strategos*”, which means the “general’s art” and represents the tactics a general planned to combat the enemy.

Today’s businesses face a competitive war; conceptually, similar to the ones in ancient times. The arena in which this war is battled is the market and it is characterized by being highly dynamic and uncertain. The enemies to be beaten are the competitors who use their core competences (weapons) to conquer the customers’ orders. Loosing this war might mean the death for the company, affecting their stakeholders (workers, investors, partners…). But no battle is won by chance, neither in business. So, there is a need for a strategy; a strategy that provides the chance to defeat the enemy by gaining a sustainable competitive advantage over him. The question is: how to do it?

The traditional approach of competition was based in the belief that there was an ideal position in the market space, cost leadership, which had to be attained by concentrating all the possible efforts of the company. But companies had to realize that “there are many ways to compete besides by producing at low cost” (Skinner 1974, p.115). Achieving a sustainable competitive advantage requires both strategic positioning and operational effectiveness. The first term, strategic positioning, is related to strategy and means differentiating your activities, or the way of performing the same activities, from the competitors’; while the second term, operational effectiveness, is related to operations management and means doing the same better the others do (Porter 1996).

Managers tend to seek just operational effectiveness by the use of extended good practices as benchmarking, outsourcing or management programs’ implementation, letting “operational effectiveness supplant strategy” (Porter 1996, p.64). Strategy involves performing different than competitors and benchmarking or outsourcing just make the companies look more alike. In strategy, choosing what not to do is as important as choosing what to do. Consequently, accepting and assuming clear trade-offs is crucial.

Thus, according to Porter (1996), strategy is the set of plans by which the company defines its unique competitive position in the market, making clear trade-offs, and ensuring the fit among all activities to support this strategy. Keeping a focused strategy, by just trying to adopt positions in the market that reinforce this strategy, is the key to maintain the competitive advantage over time.
Strategy is organized in three hierarchical levels: corporate strategy, business strategy and functional strategies. Corporate strategy provides the overall direction of the firm and consists on deciding in which businesses to participate and how to allocate the resources among them. Each of these businesses has its own business strategy, which defines how to compete in the industry. Similarly, each function designs a strategy to support the mainstream strategies to achieve competitive advantage. Functional strategies “concern investing in and developing the necessary capabilities to support business strategy” (Hill 1997, p.258). In this study, just the last two levels of strategy, business and functional, will be considered.

Julian Bordman-Weston illustrates how business strategy and the functional strategies are related to each other through the strategy tree. The trunk of the tree is the business strategy, and it is strong and solid. However, in the long term, the trunk has to be flexible enough to adapt to its environment, and so has to do the business strategy. The leaves of the tree represent the operations of the firm, and they change over time. The branches are the different functional strategies within the firm, connecting the main trunk to the leaves; i.e. linking the business strategy to the daily activities of the company. Although all the branches are different, they join all together in the trunk, and they should complement each other in order to support the common goal, the business strategy. These branches are more flexible than the trunk and thus these functional strategies have to be reviewed more often. The last part, not directly visible but still there, is the roots that sustain the tree, which symbolize the culture and the values of the firm.

Therefore, and just like it occurs in a tree, in strategy all components must fit together, complementing and supporting each other to achieve the desired objectives (see ‘figure 2.a’).

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1 http://www.sherwoodpsfconsulting.com/writings/strategytree.html
3 - BUSINESS STRATEGY

Business strategy determines the scope of the business and how it is going to compete, i.e. which dimensions of competition will be involved (Hill 1997). The objective is to achieve a sustainable preferential position in the markets.

The existing literature presents two different approaches to formulate this strategy. The first one is called Positioning Based View and claims that the performance of the firms differ in the way they decide to face the industry competition. Contrarily, the second approach is called Resource Based View and it focus on internal competencies to explain such differences between firms’ performances.

3.1 - Positioning Based View (PBV)

The Positioning Based View is based on the Industrial Organization theory and its main contributor has been Michael Porter. This approach considers the environment as the primary factor of a firm’s strategy (Oosthuizen 2002). Thus it is the ability of the managers to appropriately position the business in the environment what brings the competitive advantage for the company.

The “Five forces of competition model”, illustrated in ‘Figure 3.a’ and introduced by Porter (1985), helps to determine the competitive intensity in the industry by analyzing the strength of the different forces involved in competition. These forces are: new competitors, existing competitors, substitute products, buyer-power, and supplier power.

![Figure 3.a - Porter's five forces of competition model (Porter 1985)](image-url)
The competitive intensity defines the appealing strategic positions in the industry, from which the company will choose which ones want to occupy. Different positions imply also different strategies.

**3.1.1 - Porter’s generic strategies**

Porter described a set of generic strategies, considering customers’ needs and competitors’ activities, to use the forces of competition in the firm’s favour to achieve a competitive advantage.

These strategies are cost leadership and differentiation, each of them applied at a broad or focused level (‘figure 3.b’).

![Figure 3.b - Porter’s generic strategies (Porter 1985)](image)

On one hand, the low cost strategy seeks to provide the customer with the products at the lowest cost compared to the competitors. On the other hand, the differentiation strategy attempts to distinguish the products of the firm so the customers perceive them as unique. In both cases the objective is to achieve the highest possible profits (Kotha and Orne 1989).

A broad strategy will try to achieve a strategic advantage across all the industry, while a focused strategy will compete in a narrow market segment. The decision of covering a broad market or a narrow segment (or segments) will depend on the customers’ buying behaviour, which can be illustrated by plotting their preferences along the competitive product space, formed of the four dimensions of a product: cost, flexibility, quality and delivery.

According to Murray (1988), if the preferences of the customers are spread, implying a broad set of different needs, the firm will seek a broad strategy.
Contrarily, if the customers’ ideal positions are located in a small portion of this space, the firm will choose a focused business strategy. Next figure provides an illustration of this.

![Focused / broad strategies](image)

*Figure 3.c - Focused / broad strategies*

Mintzberg (1988) presents another set of generic strategies, in which he divides Porter’s differentiation strategy in four different types: quality, design, support, and image. These four types and cost differentiation, equivalent to Porter’s cost leadership, represent Mintzberg’s five dimensions of differentiation. Finally, the author adds a last generic strategy, called “undifferentiated”, which does not stress any of these five dimensions.

### 3.1.2 - Miles and Snow’s typologies

The Miles and Snow’s classification of business strategies is also really common in the literature. These typologies are related to the different “responses to changing environmental conditions; that is, the rate at which an organization changes its products or markets to maintain alignment with its environment” (McDaniel and Kolari 1987, p.20).

Thus, according to Miles and Snow (1978), there are four different types of strategies a business can adopt: prospector, defender, analyzer and reactor. The prospector strategy consists on continuously trying to innovate and take advantage of new product and market opportunities, which implies also taking a high risk. The defenders take almost the opposite option: attempting to protect a stable portion of the market and customers. The analyzer strategy is in the middle of the two previous strategies. Analyzers protect a stable business but they try, at the same time, to get
into new markets, assuming a moderated risk. The last group, the reactors, do not have a consistent strategy for the long term; considering just the immediate needs.

### 3.1.3 - Contingency views of business strategy

Without a strong leadership, businesses tend to move toward the middle point between strategies, losing then their competitive advantage (Porter 1985). However, some authors argued and presented empirical results which demonstrated that firms can effectively achieve more than one of the strategy types simultaneously, without sacrificing its competitive position, by being broad based competitors (Hill 1997, Ward et al. 2007). The contingency theory (Murray 1988) states that the viability of each generic strategy depends on a set of environmental preconditions; making the generic strategies not mutually exclusive, if the conditions are suitable.

Hill considers the idea of using generic strategies to be too simplistic. “Academics, consultants and third-party advisers seek generic strategies in much the same way as those who sought to change base metal into gold. (…) The reality firms need to manage embodies a diversity and dynamism that makes categorization impossible and hence irrelevant” (Hill 1997, p.259). Therefore, each situation and each firm will require a business strategy according to their characteristics.

### 3.2 - Resource Based View (RBV)

The Resource Based View theory is based on the idea of a resource-driven strategy, in which the focus on firm’s resources and capabilities is the starting point for its formulation, before deciding the strategic positioning (Oosthuitzen 2002). Therefore, the competitive advantage a company can gain depends on how good the managers strategically manage the resources and capabilities they have available.

Since the RBV is based on resources and capabilities, it is worth to briefly define them. The terms are defined according to the ideas presented by Oosthuitzen (2002).

Resources are all the assets, tangible and intangible, possessed by the organization that can be used to implement strategies. Their value can not be measured in isolation, since it depends on its interaction with the environment. What it makes a resource a source of competitive advantage is being unique and better than the ones the other organizations have. Capabilities refer to the capacity of the company to join all the resources to get a desired output.
### 3.3 - PBV and RBV

The Positioning Based View and the Resource Based view approaches of business strategy formulation are not exclusive. Actually, business strategy formulation should involve selecting the appropriate strategy, considering firm’s capabilities, among the attractive strategic positions derived from the competitive environment analysis. This can be done by applying the “SWOT analysis”, which is the study of the firm’s Strengths and Weaknesses, related to internal competencies, together with the study of the Opportunities and Threats, related to the market (Hax and Majluf 1984).

‘Figure 3.d’ exemplifies this idea graphically. The points represent the attractive positions in the market and the horizontal line delimitates the region of the product space that can be covered with the firm’s capabilities. The combination of both views suggests the selection of the market segment corresponding to higher flexibility.

![Figure 3.d – PBV and RBV](image)

‘Figure 3.e’ summarizes the business strategy formulation process:

![Figure 3.e – Business strategy process](image)
4 - FUNCTIONAL STRATEGIES

4.1 - Marketing strategy

Marketing strategy is the strategy developed by the marketing function in order to complement the other functional strategies and support the overall strategy, and it is mainly concerned with the interaction between product and market.

4.1.1 - Marketing Strategy types

The existing literature about marketing strategy describe different marketing strategies that can be grouped in four main types: product life cycle based, market share based, marketing mix based and positioning based (Greenley, 1989).

➢ Product life cycle based

This group use the Product Life Cycle (PLC) to present different strategies depending on the characteristics of each stage: introduction, growth, maturity and decline. Development is sometimes also considered, although the product it is not yet in the market. During the PLC the volume of the product grows, reaching its maximum in the maturity time and dropping after it in the decline phase (‘figure 4.a’).

![Figure 4.a](http://www.agmrc.org/agmrc/business/gettingstarted/prodlifecycle.htm)

Figure 4.a² – The Product Life Cycle (PLC)

The strategies in this group usually suggest a changing marketing strategy based on flexibility in the stages of low volume and focused on low cost in the high volume period.

There are several problems related to the use of the PLC when formulating a marketing strategy. Mainly, not all the products follow this “universal” curve and, even if they can be modelled with it, the duration of every stage is completely

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different among products (Greenley, 1989). Moreover, it is complicated to exactly identify the current stage for each product.

But the PLC is not useless at all. Actually it helps to identify market needs associated to each product and the manufacturing requirements for them.

Therefore, it can be stated that instead of being the main factor in strategy formulation, the PLC is another tool the managers have available to support their strategy.

➢ Market share based

In this case, the main determinant of the marketing strategy is the market share the business has or wants to achieve in the segment in which competes or is trying to compete into.

A relevant set of this kind of strategies are the ones resulting from the business portfolio approach. This approach uses several matrices to determine the decisions to be done and it has two different levels of applicability: corporate level and business level. It is more common to use this approach in the corporate level in order to determine the resources allocation and the investments needed in different businesses, but it can be also used in a more detailed level to determine the attractive products and market segments for a business (Hax and Majluf 1984).

The matrices are usually formed of an uncontrollable external factor and a controllable internal factor. The most used matrices are presented in ‘table 4.a’.

This approach faces two main drawbacks, as Hax and Majluf (1984) point out. The first one concerns the level of simplicity involved. These matrices are just a tool to help management to come with some ideas on possible strategies and not an approach to be systematically used to get a business strategy as a result. The second problem is the idea behind them; the idea that market share is the key for competition, which is not true for all strategies as Porter’s differentiation strategy shows.
Marketing mix based

The utilization of the marketing mix elements is the basis for the third group of marketing strategies. The marketing mix is composed by four elements, called the four P’s: product, price, place and promotion.

This group of strategies fail to distinguish between marketing strategy and marketing management (El-Ansary, 2006). Marketing management is not strategy, is the utilization of the marketing mix “to bring the marketing strategies to the marketplace” (Berry et al. 1999, p.3604); i.e. the marketing mix is used for the implementation of the marketing strategy and not for its formulation.

Positioning based

The last type of strategies is the one in which strategic positioning is the idea behind of marketing strategy.

Within this group, Greenley (1989) presents marketing strategy as a set of five components, seen by the author as the stages that should be considered when formulating it.

1) Market positioning: This component involves market segmentation and targeting, and the result of this stage is the selection of the market segments in which to compete.

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Table 4.a³ – Portfolio matrices

<table>
<thead>
<tr>
<th>Matrix</th>
<th>External Factors</th>
<th>Internal Factors</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCG Matrix</td>
<td>Market Growth Rate</td>
<td>Relative Market Share</td>
<td>BCG</td>
</tr>
<tr>
<td>GE Matrix (Industrial Attractiveness Strengths Matrix)</td>
<td>Industry Attractiveness</td>
<td>Business Strength</td>
<td>GE, McKinsey</td>
</tr>
<tr>
<td>ADL Matrix (Life-cycle Matrix)</td>
<td>Industrial Maturity</td>
<td>Competitive Position</td>
<td>ADL, Hofer</td>
</tr>
<tr>
<td>New BCG Matrix</td>
<td>Competition Method (Differentiation Opportunities)</td>
<td>Size of Competitive Advantage (Sustainability)</td>
<td>BCG</td>
</tr>
<tr>
<td>Profitability Matrix</td>
<td>Market Growth Potential, Capital Costs</td>
<td>Profitability, Cash Flow Creation</td>
<td>Marakon</td>
</tr>
</tbody>
</table>

³ Table extracted from: http://bus.hanyang.ac.kr/dynamics/bookFPT/12_chap05-2.PDF
2) Product positioning: It provides the number of products to be offered to each segment and their main characteristics in terms of product attributes.

3) Marketing mix: In this stage it is decided how the elements of the marketing mix will be used when implementing marketing management plans.

4) Market entry: This component refers to how the company intends to enter or position itself within the market segments: by acquisition of other firms, collaboration with other companies or internal development.

5) Timing: This is the last phase, which determines in which point in time the other components of the marketing strategy will be implemented.

The first two stages are related to the strategic positioning and the last three are mainly concerned with the planning of the marketing management activities. In this thesis, just strategic positioning will be considered since it is the key for the marketing strategy alignment with business strategy and manufacturing strategy.

4.1.2 - Strategic positioning process

Marketing strategy can be defined as “the total sum of the integration of segmentation, targeting, differentiation, and positioning strategies designed to create, communicate and deliver an offer to a target market” (El-Ansary 2006, p.268). Therefore, strategic positioning, product and market positioning, is the cornerstone for marketing strategy.

Market segmentation, from an operations perspective, means grouping customers in such a way that customers within a segment present similar requirements, while they show different needs across segments. Analyzing this segmentation, together with the competitors’ activities and the firm’s strengths, the company can decide which markets wants to serve and which products will be provided to these markets. The goal of this strategic positioning is to establish the competitive priorities, i.e. the key product attributes which will be stressed in order to differentiate from competitors.

The product attributes are those characteristics important for the customers and are usually: product cost, delivery time, variety range and quality (Anupindi et al. 2005). In some cases, brand name, services after-sales and other characteristics not related to manufacturing are also considered.

“Order-winners” (OW) and “order-qualifiers” (OQ) criteria were introduced by Hill (2000) to prioritize product attributes. OW are those attributes that makes the
company win an order and OQ are those criteria that the company must satisfy, in a certain level, in order to be considered as a possible supplier by the customers. These OW and OQ can be weighted to establish the appropriate set of competitive priorities.

It is critical to realize the need for trade-offs when setting these priorities, since one can not compete well in all dimensions. This theory of trade-offs will be further explained in the manufacturing strategy section.

‘Figure 4.b’ represents the marketing strategy process and its output, the strategic positioning, expressed in terms of competitive priorities.

![Figure 4.b - Marketing strategy process](image)

### 4.2 - Manufacturing strategy

Manufacturing strategy represents the set of decisions aimed to put together the resources and capabilities to support the business to achieve a competitive advantage. (Hill 2000; Hayes and Wheelwright 1984).

In the past, manufacturing was seen as a function that had to be run effectively or to do whatever it takes to deploy the other strategies (Hayes and Wheelwright 1984); but Skinner recognized the need to consider manufacturing as a strategic weapon to achieve competitive advantage, introducing then the concept of manufacturing strategy. The idea that internal capabilities can provide strategic advantage to the firm is coherent with the Resource Based View of the firm seen before.
Just like in a receipt there are ingredients and instructions of preparation, in manufacturing strategy there are content and process. The content represents those issues considered by the strategy and the process concerns the steps needed to design and implement such content.

### 4.2.1 - Manufacturing strategy content

The manufacturing strategy content is formed of the manufacturing task and the decision areas.

Manufacturing task is what manufacturing must do in order to compete and it is expressed in terms of process competences, also called competitive manufacturing capabilities. These competences can be internally and/or externally oriented; i.e. can be originated by the need to match market requirements or internal process requirements. The generic competences are: cost, quality, delivery, and flexibility.

The decision categories are the other component of manufacturing strategy content and concern the areas in which the managers have to make the decisions in order to formulate the strategy. The decision areas relate to the structure and infrastructure of the manufacturing function.

The structural areas are: process technology, capacity, facilities and vertical integration; the infrastructural ones are typically: workforce, quality, production planning and manufacturing organization (Hayes and Wheelwright 1984).

![Diagram of Manufacturing Strategy: Content and Process](Figure 4.c – Manufacturing strategy: content and process)
4.2.2 - Manufacturing strategy process

Several authors try to model the manufacturing strategy process. Wheelwright and Hayes (1985) suggest a two-stage approach that determines the process competences first, and links the structural and infrastructural decisions to such competences later. Vickery (1991) adds one step in between to facilitate the choice of the appropriate decisions. This step consists on setting numerical targets for manufacturing performance measures in relation with the process competences, such as inventory levels, lead times or level of scrap. These numerical targets are meant to be the manufacturing objectives.

The most popular model for the manufacturing strategy process is Hill’s framework, which will be considered in the section related to the alignment between manufacturing and marketing strategies, as it is based on the achievement of fit.

When making the structural and infrastructural decisions, the manufacturing strategy has to be evaluated in relation to its consistency, internal and external, and its contribution to competitive advantage. Hayes and Wheelwright present a set of criteria to be considered in such evaluation. These criteria are summarized in the next table.

<table>
<thead>
<tr>
<th>Criteria for Evaluating a Manufacturing Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consistency (internal and external)</strong></td>
</tr>
<tr>
<td>Between the manufacturing strategy and the overall business strategy</td>
</tr>
<tr>
<td>Between the manufacturing strategy and the other functional strategies within the business</td>
</tr>
<tr>
<td>Among the decision categories that make up the manufacturing strategy</td>
</tr>
<tr>
<td>Between the manufacturing strategy and the business environment (resources available, competitive behaviour, governmental restraints, etc.)</td>
</tr>
<tr>
<td><strong>Contribution (to competitive advantage)</strong></td>
</tr>
<tr>
<td>Making tradeoffs explicit, enabling manufacturing to set priorities that enhance the competitive advantage</td>
</tr>
<tr>
<td>Directing attention to opportunities that complement the business strategy</td>
</tr>
<tr>
<td>Promoting clarity regarding the manufacturing strategy throughout the business unit so its potential can be fully realized</td>
</tr>
<tr>
<td>Providing the manufacturing capabilities that will be required by the business in the future</td>
</tr>
</tbody>
</table>

*Table 4.b – Criteria for strategy evaluation (Hayes and Wheelwright 1984, p.33)*
4.2.3 - Trade-offs vs cumulative capabilities

When Skinner started with the manufacturing strategy concept, he also introduced the Trade-offs theory related to the process competences. This theory says that one can not improve one dimension without paying a trade-off with another (Skinner 1969), and that is what makes strategy necessary (Porter 1996). Actually, these kind of trade-offs are faced in the design of any system. For instance, if one wants to build a plane with more capacity, more space will be required, which means more weight and, thus, more fuel consumption, i.e. more cost.

Contrarily, the cumulative capabilities theory, with Nakane and Ferdows and De Meyer as main characters, claimed that it is possible to improve several dimensions if the “right” sequence of improvement is used. Nakane suggested the “universal” sequence: quality, dependability, cost efficiency and flexibility (Flynn and Flynn 2004). However, Ferdows and De Meyer (1990) presented another one known as the “sand cone model” in which the last two steps of Nakane’s sequence were exchanged.

The cumulative capabilities model challenges the existing literature about strategy. This model implies that all companies seek the same capabilities or process competences, facing Porter’s idea of competitive strategy based on the competition through different dimensions. Moreover, it also contradicts the idea of focused strategy and focused manufacturing task, firstly introduced by Skinner.

Then, does it mean that all the literature about manufacturing strategy is wrong? Which one is right: trade-offs’ theory or cumulative capabilities model? Actually, some authors have presented studies in which the right answer would be: a little bit of both.

The theory of performance frontiers, by Schmenner and Swink (1998), points out that the firms acting close to the asset frontier, i.e. close to the maximum achievable performance with the current resources, are regulated by the trade-offs theory; while the firms far away from the frontier can improve several dimensions at the same time.

Another unification theory is the contingency view of manufacturing capabilities presented by Hallgren et al. (1972). In this study they present two different sequences of cumulative capabilities depending on the customer order decoupling point (CODP), which is the point of the manufacturing process where the order is placed at, revealing the existence of a trade-off between flexibility and cost.
4.2.4 – Developing the strategic role of manufacturing

Manufacturing can be a strategic weapon, but not all the firms realize about it or use it effectively. For many companies, manufacturing is a weakness instead of a strength. However, it is possible to convert this weakness into a source of competitive advantage if time and effort are invested.

Hayes and Wheelwright present a four stages model where the different roles that manufacturing can play are organized as phases of a continuous development of this function. With the development of its strategic role, manufacturing moves from not participating in the company success to becoming the cornerstone of the overall competitive strategy.

These roles or stages are not mutually exclusive; actually, companies can be simultaneously in two stages. This usually happens when they are moving from one to the other.

- Stage 1 – “Internally neutral”
  
  In this “internally neutral” role, manufacturing is considered as a burden for the other functions and it is not expected to make a positive contribution to the firm. However, it is sought a minimization of its negative impact on the global organization by avoiding the biggest mistakes.

- Stage 2 – “Internally supportive”
  
  When manufacturing is “internally supportive”, the operations of the firm can be compared to the competitors’. Manufacturing capabilities are developed enough to stop slowing down the company, although they are still not a source of competitive advantage.

- Stage 3 – “Externally neutral”
  
  Moving from stage two to stage three requires developing and deploying the manufacturing capabilities in order to internally support the business to be the best in the industry. Manufacturing investments are aligned with the business strategy and a manufacturing strategy is formulated to achieve long term goals.

- Stage 4 – “Externally supportive”
  
  In this last stage manufacturing moves one step forward by being the basis for the competitive advantage the company pursues. The “externally supportive” role implies
that manufacturing is involved in marketing and engineering decisions and capabilities are developed forecasting future needs.

‘Figure 4.d’ summarizes the objectives of manufacturing for every stage as well as the main way to achieve them.

Figure 4.d – Hayes and Wheelwright 4-stages model (Slack and Lewis 2002)
5 - BUSINESS STRATEGY AND MARKETING STRATEGY ALIGNMENT

5.1 - Strategy overlap

Because customers concern all members of the organization (Piercy 1995) and because business strategy has to be matched with the market, in a practical matter, there is an overlap between competitive strategy and marketing strategy, being them confounded with each other.

The main reason for this overlap is the critical importance of the marketing strategy formulation, which can not be decided unilaterally in the marketing department as it implies choosing the strategic positioning of the overall business. The solution the companies take is to establish a corporate debate among managers of all main functions of the company in the board of directors to discuss the issues related to such product and market positioning.

On one hand, the corporate debate allows the company to align the marketing strategy with other functional strategies, so all together support business strategy. On the other hand, it deprives the marketing function to be totally responsible for their strategy.

The marketing area takes then the responsibility for the marketing management activities planning as well as a role of consultant function to work as an intermediary between the market and the firm. Thus the marketing function is seen as the executor arm of the business strategy, bringing it to the market, and the business “informer”, bringing the market to the company.

Therefore, because the most important issues in marketing strategy, which are the ones concerning strategic positioning and trade-offs are not really decided by this function but by the top managers (Piercy 1995), and because to make these decisions the top managers use the information provided by the marketing function analysis, many authors do use business strategy and marketing strategy as synonym terms. For instance, Hill (1997; 2000) and Skinner (1969; 1974) use the term corporate marketing plan to refer to the result of the whole business strategy and marketing strategy.

5.2 - Alignment

There are not real approaches to align both strategies since they actually are, and must be, designed together. Marketing strategy can be thought as a more specified
business strategy. Then, the fit between these two strategies is basically due to the top-down approach, by which business strategy works as a guideline.

Let’s consider Porter’s generic strategies. On one hand, choosing a focus or a broad strategy will serve as a basis for the market segmentation needed in marketing strategy. On the other hand, selecting a cost leadership or a differentiated strategy will provide the basis for product and market positioning.

Business strategy is based on marketing’s view of the market, customers and competitors, but this is not marketing strategy, it is marketing activities. That is why the other way alignment, the bottom-up connection, is just concerned with the involvement of marketing managers in the business strategy formulation.

Some authors relate the importance of the marketing function in business strategy to the level of market orientation of the company (McDaniel and Kolari 1987; Morgan and Strong 1997; O’Cass and Ngo 2007), based on the business strategy types introduced by Miles and Snow. Therefore, the more important the marketing function, i.e. the more market oriented the business strategy, the higher need of bottom-up alignment by involvement of marketing managers.

An empirical research (O’Cass and Ngo 2007) demonstrates that prospector is the type with highest market orientation, facing also the highest competitive intensity while reactor appears in environments with low competition and brings low market orientation to the firm. Analyzer and defender are in between of these two extremes, with analyzer being closer to prospector. This study also points out results showing that more market orientation brings higher performance.

Close to the idea of market orientation, Slater and Olson (2001) present a set of marketing strategy types derived from clustering observations of marketing activities in manufacturing and service firms, and analyze their match with the Miles and Snow typology, excluding reactors since they do not really follow a strategy.

5.3 - Model

As a conclusion, ‘Figure 5.a’ shows the relationships explained between marketing activities and business strategy and marketing strategy.
Figure 5.a – Business strategy and marketing strategy alignment model
6 - BUSINESS STRATEGY AND MANUFACTURING STRATEGY ALIGNMENT

On one hand, manufacturing strategy must support the business strategy and, on the other hand, the business strategy should be formulated according to the manufacturing capabilities, resulted from the manufacturing strategy. The first perspective is the top-down view of the strategy and the second one is the bottom-up view.

Most of authors consider the top-down approach when studying the fit in strategy formulation. Some examples are Wheelwright, Skinner and Vickery who provide a method to formulate the manufacturing strategy, in which the first step is the determination of the manufacturing task or process competences according to the business strategy.

However, together with the recognition of the strategic role of manufacturing, the requirement for a complementary bottom-up alignment shows up. For instance, Skinner (1969) suggests that the results of the implementation of the manufacturing strategy should be used as a feedback loop to business strategy formulation. Similar ideas are pointed out by the Resource Based View of the firm and the SWOT analysis, as it has been seen in previously.

6.1 - Two-way alignment approaches

6.1.1 - Strategic resonance framework (Brown and Blackmon 2005)

The top-down approach for strategy formulation brings a strategic dissonance by not involving the manufacturing managers at the upper levels of decision-making in the firm and by considering manufacturing just as a technical area, out of business strategy scope.

The solution that Brown and Blackmon provide is conceptualized as the “Strategic Resonance framework”, which intends to incorporate the bottom-up view to the top-down approach. The idea is to have a market-led and resource-driven strategy because the simultaneously match between market requirements and manufacturing capabilities is what will bring the competitive advantage to the company.

In order to contribute to the strategic resonance, three main suggestions are presented. First, manufacturing managers must invest in manufacturing capabilities and clearly define them. Second, technical background of senior management must be emphasized to increase their awareness of such manufacturing capabilities.
Finally, the importance of the role played by manufacturing managers in the strategic process must be increased. These three recommendations will enhance an easier incorporation of the manufacturing view in the business strategy formulation.

Other studies also pointed out the need for incorporating manufacturing managers in the mainstream strategy formulation (Skinner 1974; Swamidass et al. 2001) as well as its positive relationship with firm performance (Swamidass and Newell 1987).

6.1.2 - Generic manufacturing strategies (Kotha and Orne 1989)

Kotha and Orne contribute the literature with a set of generic manufacturing strategies that represent a conceptual model for fit between Porter’s generic strategies and manufacturing structures. These manufacturing structures are based on a typology characterized by three dimensions: process structure complexity, product line complexity and organizational scope.

The first dimension, the process structure complexity, is the sum of the mechanization level, the level of systemization used to control the process and the level of interconnection among the different operations. The lower level of discontinuities, the higher product focus and not process focus, and the higher level of production standards imply higher process structure complexity.

The second dimension, product line complexity, considers the end-product complexity, the variety of final product, the individual product volumes and the experience accumulated in producing the product. The lowest complexity is represented by short and simple product lines with high volumes of products in the maturity stage.

Finally, the last dimension, which concerns the organizational scope, takes into account the following variables: geographic manufacturing scope, geographic market focus, vertical integration, customer-market scope and scale. The higher the level of these variables, the higher will be the organizational scope.

In order to relate these dimensions with the generic business strategies, the following assumption is done: businesses with a cost leadership strategy usually have manufacturing structures with high process structure complexity and low product line complexity, while businesses with differentiation strategy tend to have the opposite type of structures.

The result of this research is the positioning of the four Porter’s strategies in the vertexes of a cube formed of the three dimensions considered. ‘Figure 6.a’
graphically summarizes the relationships between business’ strategies and manufacturing structures, becoming a useful tool to consider their match.

**Figure 6.a – Business strategies along the three manufacturing dimensions**
*(adapted from Kotha and Orne 1989)*

Positions 2, 3, 6 and 7 correspond to the generic business strategies. Positions 4 and 5 are considered unattractive since they represent mixed strategies and positions 1 (segment: neither cost nor differentiation) and 8 (industry-wide: cost and differentiation) might be reasonably attractive positions for the authors even though they are located off the diagonal in the product-process matrix of Hayes and Wheelwright, indicating a mismatch.

**6.1.3 - Configurations of manufacturing strategy and business strategy (Ward et al. 1995)**

Configurations are clusters of characteristics coherent among them and they are used to link business and manufacturing strategies. The configurational approach is interesting because “it yields a systematic, detailed, and holistic image of reality” (Ward et al. 1995, p.602), representing patterns of success in the industry.

The configurations analyzed by Kotha and Orne (1989) around generic manufacturing strategies have been already presented. Another configurational study
is the one developed by Ward, Bickford and Leong (1995). In this study the authors present four different configurations based on the following business strategies: niche differentiator, broad market differentiator, cost leader and lean competitor, where the lean competitor seeks simultaneously low cost and differentiation. Next table, build from the ideas pointed out in the article, summarizes the characteristics of each configuration.

<table>
<thead>
<tr>
<th>Competitive strategy</th>
<th>Manufacturing strategy</th>
<th>Key manufacturing choices</th>
<th>Manufacturing strategy characteristics of each configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Niche differentiator</td>
<td>Specialized product/service in a market segment</td>
<td>Job shop/small batch process, Facilities focus, Small inventories (for delivery differentiator → JIT), highly skilled workers, mainly quality differentiator</td>
<td>Backward and forward integration → loss of flexibility → strategic alliances, Decrease setups (maximize utilization) and minimize WIP, Centralized organization and few direct production workers</td>
</tr>
<tr>
<td>Broad market differentiator</td>
<td>Wide range of products and markets</td>
<td>Batch (setups!), AMT can reduce cost of flexibility, Multiple plants (focused plants)</td>
<td>Increased mechanized flow, AMT can help but not enough, Continuous improvements, Cross-functional relationships</td>
</tr>
<tr>
<td>Cost leader</td>
<td>Lower price than competitors → efficiency</td>
<td>Scale economies</td>
<td></td>
</tr>
<tr>
<td>Lean competitor</td>
<td>Cost leadership and differentiation, Danger! Stuck in the middle</td>
<td>All capabilities high level from long term programs</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.2 – Manufacturing strategy characteristics of each configuration

6.2 - Empirical examination of linkages

The configurational approaches in the previous section are based on empirical studies but, due to the importance of their results, they have been analyzed apart. In this section, other empirical studies are pointed out.

The first one (Ward et al. 2007) tests the linkages between three business strategies and several structural and infrastructural dimensions by doing two-pair comparisons. These three business strategies, broad-based competitors, differentiators and price leaders, are obtained from a cluster analysis performed in a sample of 101 firms.
Sun and Hong (2002) evaluate the statistical significance of the effect that the alignment between business strategy and manufacturing strategy has on manufacturing and business performance. The results reveal that the level of fit between these two strategies influences the manufacturing performance and that, only when they are in alignment, business performance is improved through a better manufacturing performance. However, this alignment is necessary but not enough to improve business performance because many other factors influence this variable.

Another study (Williams et al. 1995) points out a significant relationship between the level of differentiation of business strategy and the technology/market orientation of the manufacturing strategy. Also a weak relationship between manufacturing strategy and business performance is observed, which weakness may be due to the existence of other effects apart from manufacturing, in concordance with Sun and Hong’s results.

Rhee and Mehra (2006) use regression analysis and fit measures, calculated as a deviation from the best performance profiles, to determine that competitive strategy affects the relationship between operations and business performance in the bank industry. Therefore, business strategy indirectly exerts business performance through its influence on operations and marketing activities.

Olhager et al. (2007) find empirical support to state that the alignment of business strategy and manufacturing strategy influences the importance of manufacturing as a competitive resource, which is related to higher business performance.

The last study considered (Brown et al. 2007) explores the linkages between strategy and world-class performance across seven performance measures concerned with quality, lean production and innovation. Results support that in world-class plants there is a stronger alignment between business strategy and manufacturing strategy and a greater involvement of manufacturing management in business strategy than in non-world-class plants.

6.3 - Misalignment

The most common cause of misalignment between business strategy and manufacturing strategy is an excessive emphasis on cost, regardless of the chosen competitive strategy (Skinner 1974, Ward et al. 1996). Manufacturing managers are usually evaluated in terms of efficiency and cost reduction even when the strategy is differentiation.
Such misalignment brings a lower business performance, which can lead to long term poor performance if this misalignment is not corrected. Realignment takes time and needs of the right investments and decisions. The realignment may also require a readjustment in the competitive strategy.

6.4 - Model

‘Figure 6.b’ shows the elements related to business strategy and manufacturing strategy and the linkages analyzed by the two-way alignment approaches presented before, in section 6.2.

Figure 6.b – Business strategy and manufacturing strategy alignment model
7 - MARKETING AND MANUFACTURING STRATEGIES ALIGNMENT

Marketing strategy and manufacturing strategy have in common the need to support chosen markets (Hill 1997). This is the basis for the alignment between these two strategies.

7.1 - Alignment approaches

7.1.1 - Hill’s framework (Hill 2000)

Hill’s framework is used to formulate a manufacturing strategy aligned with the competitive priorities determined by the marketing strategy. The framework is structured in five steps. After deciding the corporate objectives and formulating the marketing strategy, the order winners and order qualifiers that manufacturing has to accomplish are established, which is the third step. The next step is choosing the process choice. Finally, the fifth step consists on deciding the manufacturing infrastructure, which is automatically set since every process technology has its own characteristics regarding structure and infrastructure.

In this framework, the OQ and OW are the linkage between marketing and manufacturing strategies because they represent the market requirements and they are the basis to define the manufacturing objectives.

A sixth step, not explicitly included but emphasized by the author, concerns to the corporate debate, in which a deep review of the business in terms of both marketing and manufacturing has to be carried out. Next figure illustrates such corporate debate involving the review of the five steps.

![Figure 7.a – Strategic corporate debate in Hill’s framework (Hill 1997)]
Menda and Dilts (1997) introduce two middle steps to create a multifunctional debate in order to select the order winners and qualifiers, and to convert them into a manufacturing task before setting the process technology.

Berry et. al. (1999) suggest an adapted Hill’s framework, in which the last three steps are slightly changed. After deciding the OW and OQ, the manufacturing performance has to be checked in relation to them, to design a manufacturing strategy that closes “the gap between market requirements and manufacturing capabilities” (Berry et al. 1999, p. 3609). The next step implies a comparison between the manufacturing strategy and the current manufacturing performance, identifying the points of misalignment, to provide, in the last step, suggestions to improve their fit, which might imply changes in marketing and manufacturing strategies.

7.1.2 - Market segmentation from operations perspective (Berry et al. 1991)

The marketing view of market segmentation consists on dividing the markets into groups of customers showing similar buying needs. The problem of this view is that it does not consider the effects on manufacturing. While for the marketing department serving different markets can be easily feasible, it can require several different strategies in the manufacturing function.

The literature has strengthened the need of keeping a focused manufacturing task (e.g. Hayes and Wheelwright 1984, Skinner 1974), but on what competences should it be focused? This question is what market segmentation from an operations perspective tries to determine. The idea is to segment the market not only considering the market needs but also the operational needs associated.

The suggested methodology is based on a two-step clustering approach. The first step requires weighting the variables considered, a mix of operational variables and order winners and qualifiers, and measuring the similarity between products across the key variables. From this analysis, it will be obtained a graphical summary which will allow setting a first group of clusters, linking the products with higher similarity between them. The second step uses an iterative method to refine such clusters.

With this methodology, the market will be “broken up into focused product groups” (Berry et al. 1991, p. 366) representing potential focused manufacturing tasks. This analysis allows marketing managers to consider the manufacturing investments required for the different marketing decisions and it also provides a basis to the
operations managers about the choices required when formulating the manufacturing strategy.

**7.1.3 - Focused factory approach (Skinner 1974)**

The focused factory approach, introduced by Skinner, consists on four steps that will provide a focused manufacturing strategy related to the market requirements.

Management must formulate the marketing strategy first and then translate the objectives resulted from such strategy to manufacturing objectives, i.e. to a manufacturing task. The market segmentation method presented before can work as a link between the first two steps (Berry et al. 1991).

Once the manufacturing task is chosen, an examination of the existing production system is needed, which will allow the managers to take the last step, reorganizing the elements and consider the investments required to achieve the manufacturing task.

When considering more than one manufacturing task, Skinner suggests the concept “plant within a plant” (PWP) so each unit works independently with a focused task.

**7.2 - Methods to examine alignment/misalignment**

**7.2.1 - Product-process matrix (Hayes and Wheelwright 1984)**

The product-process matrix of Hayes and Wheelwright suggests how the process technologies should evolve compared to the stages of the product life cycle. Thus it can be used to illustrate the match between the process technologies in a manufacturing company and the products or market characteristics. When they are aligned, the products fall into the descendant diagonal of the matrix. If the products are far away from this diagonal, it means that a mismatch or misalignment exists. These two situations can be observed in ‘figure 7.b’.

The product-process matrix presents some disadvantages. First, it can indicate a possible mismatch but it neither explains its origins nor its possible resolution (Hill et al. 1998). Second, it considers the classical process choices and so the introduction of new process technologies such as the Advance Manufacturing Technology (AMT) may challenge this approach. Finally, the positioning in the matrix is a subjective task (Bozarth and Berry 1997).
7.2.2 - Product-profiling (Hill et al. 1998, Hill 2000)

Product profiling can be used to systematically examine the elements of fit between market requirements and the existing manufacturing structure and infrastructure, and to help marketing and manufacturing managers to understand the relationships between these elements (Hill et al. 1998).

This tool compares two profiles, the current situation and an ideal profile, on a continuum line that illustrates the typical choices about key characteristics of markets, process and infrastructure.

The comparison process starts with the selection of the dimensions to be considered, concerning products, markets, process and infrastructure. Then, for each dimension, the two extreme positions resulting from the choice of the process are displayed. Finally, it is time to position both profiles.

‘Figure 7.c’ shows how each dimension evolves when moving the process from jobbing to line, passing through batch. It also displays the two profiles analyzed: the current strategy (black) and the original investments (white).
It can be noticed that the original profile, in white, presents aligned strategies concerning markets and manufacturing. However, the black profile shows that manufacturing is not able to respond to the new market needs. For example, one can see that the process has many expensive setups and cost is an OW. Thus the manufacturing managers should try to reduce the cost of such setups or produce in higher volumes.

Just like in the product-process matrix, the disadvantages of this method are that it considers the classical process technologies and that the profiling implies a subjective task from the managers (Bozarth and Berry 1997). However, the product profiling method presents a clear advantage over the product-process matrix: it shows not only the existence of a mismatch but also where it is and it helps to identify the causes and the ways to realign the strategy.

7.2.3 - General product profiling (Bozarth and Berry 1997)

Bozarth and Berry’s method tries to overcome the disadvantages encountered by the previous two approaches by presenting a product profiling that provides numerical measures of strategic fit.
The method is based on Hill’s product profiling since it operationalizes the alignment as a profile deviation but it provides a mathematical model to calculate such deviation. It allows considering different performance measures such as volume or lead time, previously found to be statistically significant.

The comparison between the two profiles may represent two different proposals, and then see which one is the best, or one of them may be an ideal profile, based on agreed values, and thus compare the suggested profile with the ideal one.

To do so, after doing some calculations based on statistical techniques, the market entity considered (product, customers or orders) on each profile is plotted in a generalized profile plot as the one presented in the following figure.

![General product profile (Bozarth and Berry 1997)]

If the comparison is done with the ideal profile, like in ‘figure 7.d’, then the ideal profile is the zero standard deviation line and the left side of it implies a lower performance value while the right side shows a higher performance value in relation with the ideal. If the comparison is done between two proposals, the one located more in the right side will be the one that has higher results. Depending on the performance measure studied, the objective will be to increase or decrease its value.

This method has several advantages from Hill’s product profiling. First, it is not constrained to the classical processes. Second, this “methodology distinguishes between those dimensions that actually affect market-manufacturing congruence and those that do not” (Bozarth and Berry 1997, p.141). Finally, it uses scalar quantities and statistical techniques to measure the misalignment, making easier to evaluate the impact of changes in the market requirements or proposals about changes in the manufacturing investments.
7.2.4 - Measures of focus and fit

Richardson et al. (1985) present a methodology tested in Canadian electronics firms, to measure the congruence between business strategy and manufacturing task and their degree of focus. The degree of focus relates to the “attention paid to the most important variables” of a business strategy or manufacturing task.

Six types of business strategies and four types of manufacturing tasks are identified by studying the existing literature and interviewing the firm’s executives. The business strategies range from strategies based almost entirely on innovation to those based mainly on low-cost.

Results indicate that an increased level of focus and higher congruence between business strategy and manufacturing task bring improved profitability, with a more important effect of the focus in this relationship.

7.3 - Empirical examination of linkages

Rho and Hahm (1994) test several hypotheses related to the congruence between marketing and manufacturing and its influence on manufacturing performance. Results indicate that the alignment between these two functions is positively correlated to performance. From the hypotheses statistically supported, it can be concluded that in order to improve the congruence between marketing and manufacturing strategies, it is required: greater communication between functions, increased coordination mechanisms and a good understanding of the trade-offs based on capabilities. The study also finds out that the higher the manufacturing flexibility, the higher the congruence with marketing.

Da Silveira (2005) test and finds empirical evidences that a higher level of misfit between marketing and manufacturing strategies, measured as a deviation to the ideal profile, leads to lower performance. However, Olhager et al. (2007), find that the functional alignment has not a significant relationship with manufacturing as a competitive resource. This means that even though manufacturing is not aligned with marketing, manufacturing strategy is still a competitive weapon, influencing manufacturing performance and thus, the overall performance of the business.

Lastly, Swamidass et al. (2001) analyze three companies to study the agreement and disagreement between marketing and manufacturing managers regarding strategy. The results show that manufacturing managers usually consider a broader set of strategic objectives to compete and that the main point of disagreement between the
managers of both functions is concerned with the role of delivery performance, seen as critical by manufacturing and usually ignored by marketing managers once the sale is done. However, managers agree about the importance of quality and the strategic role of product flexibility. “If manufacturing and marketing managers participate and contribute equally to the strategy development process, the potential for incongruent strategic goals between these functions can be reduced or eliminated” (Swamidass et al. 2001, p.935)

7.4 - Misalignment

There are several reasons that can bring marketing strategy and manufacturing strategy into misalignment. The main causes for that are having a process that involves trade-offs not consistent with the markets served, i.e. marketing and manufacturing pull in different directions; or that the business fail to recognize that different manufacturing tasks are required because of the adoption of new products or because of gradual changes in market needs (Skinner 1974, Hill et al. 1998). Not noticing the mismatch can make it greater and perpetuate it.

Therefore, to realign the strategies it is important to identify the elements of misalignment and understand its origins. Then, it may be necessary to agree the trade-offs between marketing and manufacturing managers, changing some of the manufacturing decisions or reconsidering the strategic positioning of marketing strategy. However, some companies may prefer to live with the mismatch, knowing and accepting the consequences that it will bring in the short term and the long term (Hill et al. 1998).

7.5 - Model

Similarly to the previous models, next figure graphically summarizes the linkages established by the theoretical approaches presented in this section.
Figure 7.e – Marketing and manufacturing strategies alignment model
8 - OVERALL MODEL

8.1 - Preliminary model discussion

So far, the alignments between business strategy, marketing strategy and manufacturing strategy have been introduced in pairs. ‘Figure 8.a’ tries to cover these three areas and model their relationships, considering all the elements studied in the literature review.

Two main strategic directions guide this model: a first one, representing the top-down approach of strategy formulation; and a second direction, following the idea of the bottom-up view.

As can be observed in the model, business strategy guides the marketing strategy and, indirectly, through it, influences the manufacturing strategy. Besides, both functional strategies help in the formulation of the business strategy, together with the market analysis, performed by the marketing function but not considered strategy.
The relationship between marketing and manufacturing strategy exists mainly around the OW and OQ, which are key to bring these two strategies into alignment. Apart from that, the manufacturing capabilities have to be considered by the marketing managers when segmenting and targeting the markets, and also by the manufacturing managers in order to make the decisions required to convert them into the desired capabilities, regarding the manufacturing task.

Several approaches that link these two strategies have been presented and briefly discussed in the previous section. If a complete congruence is sought, an agreement between marketing and manufacturing managers about OW and OQ is crucial as well as coherent decisions with such OW/OQ.

Just like marketing concerns the relationship between the customer and the product, manufacturing relates such product to the process. Therefore, the common element for these two functions is the product, which is usually left behind in favour of functional interests. Then, product design strategy may work as a mediator in the discussion between marketing and manufacturing, helping to attain the desired functional alignment.

8.2 - Product design as a functional mediator

Product Design strategy is another functional strategy, and so it remains in the last strategic level together with marketing, manufacturing and other functions of the company. Due to its functional level, it is guided by the business strategy, supporting it at the same time.

The key point here is to analyze how this function, which determines the products physical characteristics, can play an intermediary role between marketing and manufacturing.

Design strategy is a strategic resource, as manufacturing is, because it provides the chance to achieve a competitive advantage through the product design by creating new products and thus allowing the firm to get into new markets and/or by satisfying existing customers’ needs better than competitors (Fitzsimmons et al. 1991).

8.2.1 - Design strategy approach (Fitzsimmons et al. 1991)

This two-step approach considers the OW and OQ as a preliminary input. In the first step, the product design task is defined by positioning the product along the two design dimensions: complexity and innovation. Once this positioning is done, related to the OW and OQ, in the second step the appropriate design infrastructure is chosen.
The design infrastructure is formed of two elements: the design organization or design team, and the design support systems to help the design organization to carry out the product design task.

8.2.2 - Design, marketing and manufacturing

Product design and marketing are linked by the customer needs to be considered and design and manufacturing relationship is established by the design for manufacturing. This means that the product design function must provide the necessary features to the products, determined by marketing, and consider their manufacturability, i.e. their ability to be “easily” manufactured.

Design also contributes to overcome part of the trade-off between cost and flexibility by, for instance, delaying the differentiation point and standardizing the components. Thus the costs associated to a product may be reduced, while maintaining flexibility, by creating a common inventory before the differentiation point and/or by allowing economies of scale for components. This standardization helps also to reduce the lead times by delaying the order decoupling point. Other similar measures can be undertaken by the design and operations managers, together, to meet the requirements set by marketing.

Fitzsimmons et al. (1991) present the following framework (see ‘figure 8.b’) to relate marketing, manufacturing and design strategy. The link among them is based on the idea of OW and OQ.

![Figure 8.b – Marketing-manufacturing-design framework (Fitzsimmons et al. 1991)](image)

According to the authors, this framework can be used not only sequentially, to understand and clarify the trade-offs that a marketing strategy implies for manufacturing and design, but also repeatedly during the corporate debate to close the gap between and among the functional strategies if a misalignment exists. Iterations in the process should be carried out until this misfit disappears.
Hill (2000) also uses the OW and OQ criteria to link these three functional strategies. He classifies these criteria in three main categories: no manufacturing related, manufacturing specific and manufacturing related but no specific. Design will be involved in the first and third categories and manufacturing in the last two (see ‘figure 8.c’, built from Hill’s classification).

In this section, product design has been considered as a possible mediator between marketing and manufacturing. However, some conflicts between marketing and design and between design and manufacturing can also arise. Mukhopadhyay and Gupta (1998) present an approach to solve all these conflicts. Marketing, manufacturing and design strategies are respectively characterized by the following strategic factors: market predictability, production flexibility and design complexity, which can get a low or high level. Some of the interface variables are total quality management, information technology, cross-functional teams and shared incentives. The idea is to identify the areas of possible conflict between the strategies, by plotting the products in 2x2 matrices formed of two strategic factors, and then use the solutions suggested, based on the utilization of the interface variables.

**8.3 - Final model**

The final model, ‘figure 8.d’, incorporates the design strategy as an element more in the network of relationships created by the business strategy, marketing strategy and manufacturing strategy. Even though there is a linkage between business strategy and design strategy, because it is a functional strategy, it is not presented in the model because it is not an objective of this thesis to model this relationship. However, a bottom-up connection from product design strategy and business strategy it is shown because this functional strategy is seen, as manufacturing, as a competitive weapon and thus must be considered when formulating the mainstream strategy.
A similar model, but just with the most basic relationships between strategies is represented in ‘figure 8.e’. In this figure, the connection between business strategy and manufacturing strategy is drawn in discontinuous line since it is a weak direct link. Actually, their real linkage is created through the marketing strategy. Again, the connection from business strategy to design strategy has not been represented since it has not been directly considered in this thesis.
9 - CASE STUDY

9.1 – BT/Toyota Europe

BT is a company that manufactures forklifts for internal transportation in warehouses. This company is part of the Toyota Material Handling Europe group, since it was acquired by Toyota in 2000. The unit visited for the analysis of the case study is settled in Mjölby (Sweden), but there are other partners in other countries that, together with the one in Mjölby, are under the control of the headquarters located in Brussels.

9.1.1 - Organization

The organization of Toyota Material Handling Europe (TMHE) is based on a functional division as it is shown in ‘figure 9.a’. Within this functional organization there are four units related to marketing and manufacturing activities, which are the ones displayed in the figure.

![Figure 9.a – TMHE organization](image)

The Supply unit is responsible for producing and providing the products as well as for developing the manufacturing strategy. Marketing Organization creates the packages of products and services to be offered to the customers and the Sales unit do the daily work concerning the customer orders. The Sales function also places the requirements concerning product mix, volumes and lead times to manufacturing. Finally, Product Planning is in charge of ensuring that the company produces competitive products by defining the characteristics of the products that will be offered in the market.
9.2 – BT and strategy

➢ Business strategy

The business strategy of the company is agreed by the board of directors in Brussels and the owner, Toyota. The current strategy consists on increasing their market share competing basically through quality, product fit and delivery time. They are the order-winners for the company. Besides, considering the existing trade-off between cost and flexibility, the company has a deeper interest in cost. Because the business strategy is formulated considering the market characteristics and its requirements, it can be said that is a market-driven strategy.

Once the business strategy is formulated, it is spread out using two different ways of communication. The first one is based on the publication of a written document that summarizes the mission of the company and its strategy and it is accessible for the relevant managers, being kept as a secret for the competitors and most of the workers. The second way for communicating the business strategy is through meetings carried out by the high level management in which the managers discuss about the long term, middle term and short term objectives for the company. The objectives set for the long and middle term are basically strategic while the short term goals correspond to more operational expectations needed to achieve the strategy. Last year, there were two of these meetings.

➢ Marketing/Product strategy

The Product Planning unit is basically responsible for the characteristics of every product manufactured and Sales considers the volumes, product mix and lead times. From now on, both Sales and Product Planning will be referred as marketing, which formulates a combined marketing and product strategy. The reason for using a common term is creating an equivalence with the concepts introduced during the literature review.

The definition of the marketing/product strategy is based on a SWOT analysis that considers both the external and internal opportunities. Therefore, this strategy is not only market-driven but also capabilities-driven.

The external opportunities are sound out by studying the customers and potential customers’ requirements, the competitors’ activities and the appearance of new technologies. For example, a new law that forces some businesses to have material
handling devices to help the employees creates a chance to attract new customers. Competitors’ offer is also important because it can make the business to win orders if its offer is better.

The internal opportunities can come from R&D or from manufacturing. Sometimes a technology improvement carried out by the R&D function can help the company to offer features to the customers that are useful for them but they did not realize yet, as it can be the remote control for the operation of the forklifts. Manufacturing can also provide some suggestions for the product concerning its manufacturability, e.g. asking for a component modification to make it easier to be assembled and thus reducing the total lead time of the process.

- **Manufacturing strategy**

The manufacturing strategy in BT responds basically to the demands placed by marketing and the business strategy. The key manufacturing tasks for them are quality, delivery time and cost against flexibility.

In order to accomplish such objectives the company manufactures its products according to the manufacturing guidelines coming from Toyota in Japan and summarized as the Toyota Production System (TPS), based on lean management. This way of managing manufacturing implies a reduction of everything considered as waste (extra time, extra cost, extra capacity, errors…. ) to achieve higher quality, a lower cost and a reduction of the lead time.

**9.2.1 – Strategy Process**

The strategy process in BT starts with the formulation of the business strategy, which works as a general framework for the functional strategies. Then, the product planning function carries out a SWOT analysis in order to come with the product plan, which includes a set of product related proposals that are then analyzed more in detail, collecting opinions from all the functions involved.

The next step is called “Decision Point”, performed by a group of representatives of each relevant function, and consists on deciding, for each one of the proposals presented, if the project is accepted or not and, in case of a positive answer, which are the specific objectives to be achieved. Within this decision point there are three different levels: DM1, DM2 and DM3. DM1 is the highest level of decision because it concerns the introduction of a new technology platform. In this case, the board of
directors are involved in the decisions. DM2 refers to a new product introduction and DM3 to minor changes to be done on existing products.

When the projects are defined and accepted, the cross-functional teams responsible for developing them are created. The output of these projects will work as product requirements for manufacturing together with the specifications from marketing related to volume, product mix and lead times. After all these steps, manufacturing has to design a strategy that assures the accomplishment of such requirements. ‘Figure 9.b’ and ‘figure 9.c’ summarize this sequential strategy process followed by BT.

![Figure 9.b – Marketing/product strategy process](image)

![Figure 9.c – BT strategy process](image)
The requirements placed by marketing in terms of product features, volume, lead time and product mix imply an extra effort for manufacturing concerning capacity. The capacity constraint is considered during the marketing/product strategy formulation in several points of the process: the product plan, the decision point and the projects themselves. In these steps, there is always a discussion between marketing and manufacturing members that study the implications on manufacturing of each proposal and check their feasibility, mainly considering the capacity problems associated. Moreover, there is a monthly meeting among managers where they talk about capacity and other operational issues.

Conflicts can show up for two more reasons. The first one concerns the special orders that imply modifications of the standard product and that could bring more capacity problems to manufacturing. The solution adopted is to have a special manufacturing unit, responsible for these changes, so manufacturing simply continues with the regular product mix production. If the volume of a particular modification increases, then it may be considered as an opportunity of business, becoming a proposal within the product plan. Finally, the last conflict between marketing and manufacturing arises from the way of calculating the production volume, based on forecasting. When the actual orders are higher than the forecasts, there is a pressure of marketing over manufacturing to increase the volume in order to cope with all the orders. However, if it is the opposite case, if the actual orders are lower than the forecast, then it is manufacturing who stresses marketing to sell the over production.

9.3 – BT case and the literature

During the analysis of this case, several similarities with the previous study showed up. The first one is the strategy process followed by the company, which matches pretty well the overall model for alignment presented after the literature review. This process is based on a sequential approach where the alignment is achieved due to the constant dialogue and discussion among the different functions involved.

The corporate debate for the formulation of the business strategy, done by the board of directors, the SWOT analysis, performed by product planning in order to consider not only the market requirements but also the capabilities of the firm, or the cross-functional meetings and teams used in almost all the steps of the formulation process are other examples of ways used by BT to attain strategic congruence that have also been presented before in this thesis. Probably, the main difference is the fact that the company does not really use any of the tools introduced to check the
alignment/misalignment and bases it just on the agreement and discussion already mentioned.

Next two issues are critical: the role of the product in the overall alignment and the strategic role of manufacturing. The product represents the cornerstone for the strategy congruence in the company, being all strategies formulated around it and being the real linkage between marketing and manufacturing strategies. The output of marketing strategy and business strategy is related to the product and it works as an input for manufacturing in terms of product characteristics and production requirements. ‘Figure 9.d’ models all this relationships and displays the central position of the product between the strategies.

![Figure 9.d – Central role of the product in the overall strategy alignment](image)

Finally, in BT/Toyota Europe, manufacturing still has a reactive role. Analyzing the manufacturing role in the overall strategy of the company, in comparison with the four stages model of Hayes and Wheelwright, one may conclude that, in this company, manufacturing can be positioned in stage three, where manufacturing supports the strategy but it is not strategic. In this case we could say that the overall strategy is basically product and market driven but not manufacturing driven. Managers should try to find the way to move the role of manufacturing from stage three to stage four, where it really becomes strategic.
10 - CONCLUSIONS

The objective of this thesis was to simultaneously study the fit among marketing, manufacturing and business strategies. To achieve it, these strategies have been studied in pairs, presenting approaches to attain their alignments and their re-alignments, if a mismatch is produced.

Moreover, two models that cover these three areas simultaneously have been introduced in order to work as a graphical summary of the elements that form the strategies considered and their connections.

The approaches are meant to be tools to contribute to the achievement of the strategy alignment, together with the suggestions provided next in this final part. The models intend to create a general framework that helps the managers to understand how the strategies affect each other.

Final reflections and remarks

When trying to align business, marketing and manufacturing strategies, the first thing to do is to formulate a business strategy that really considers the firm’s characteristics. Thus a corporate debate, in which all functions participate, has to be formalized.

Manufacturing and design capabilities are a source of competitive advantage. So, these two functions have an important role in the corporate debate, ensuring the bottom-up alignment. It is also important the marketing function, which contributes to the debate with its view of the market, facilitating the following top-down alignment between business strategy and marketing strategy and, through it, with manufacturing and design strategies.

![Figure 10.a – Market-let and capabilities-driven business strategy](image)
In conclusion, the business strategy has to be market-led but also capabilities-driven (manufacturing and design capabilities), as shown in ‘figure 10.a’.

Once this general alignment with business strategy is reached, it is necessary to attain congruence between the marketing and manufacturing strategies, so they work as a team to help the business to achieve a competitive advantage over its competitors. But this congruence does not arise by itself. Contrarily, these two functional strategies tend to drive apart if an effort to join them is not done. The reasons for these functions to diverge are basically the different backgrounds of the managers, who do not understand their colleagues and do not respect the other function, and the different reward systems applied to them, being marketing managers measured by sales attained and manufacturing managers by cost reduction achieved; instead of both being rewarded according to the overall profits (Shapiro 1977).

Consequently, dialogue and discussion between these two functions is necessary to agree the trade-offs chosen in both strategies. In this discussion, design strategy plays an important role, as it has been previously analyzed, because it brings the product into the discussion, making easier for both marketing and manufacturing managers to find a common arena. Therefore, there is a critical need to formulate an integrated marketing-manufacturing-design strategy.

The question is: why do the companies split up the integrated strategy in several functional strategies? The answer seems to be that the functional organization of the businesses forces them to a separation of their strategies. So, it is important to promote cross-functional communication in order to formulate a set of strategies that focus on the same objectives, i.e. a set of strategies that are basically a single strategy.

This integrated strategy would be really interesting mainly for new product development because the major trade-offs related to the attributes of the products are usually faced in their design phase (Fitzsimmons et al. 1991, De Búrca et al. 2004).

However, companies should bear in mind that conflicts between design and the other functions can also show up. The possible solutions for all the conflicts that can arise between the functional strategies include cross-functional teams for the strategies formulation, the enhancement of managers’ technical background, so the communication improves, and the use of interface variables like Total Quality management or other programs that help in the resolution of such problems.
Somebody could say that product development already works with cross-functional teams, but it occurs in the lowest level, which is mainly operational rather than strategic; that is why the suggested cross-functional teams have to be created in the strategic level, formed of managers and workers of the three functions analyzed.

**Implications for researchers**

From the literature review done in this thesis and from the reflections presented, two main directions for further research showed up.

The first one concerns the unification of the existing marketing strategies in a single theory that clearly distinguishes marketing strategy from marketing management and that easily defines the differences with business strategy.

The second direction of study consists on the further investigation of the role of product design strategy in the alignment between marketing and manufacturing as well as the possible approaches for formulating an integrated marketing-manufacturing-design strategy.

**Implications for managers**

Manufacturing managers must enhance and develop the strategic role of their function in order to move forward in the four stages model of Hayes and Wheelwright to make manufacturing capabilities one of the bases for competitive advantage. The same should do the managers responsible for product design strategy. Therefore, the company will be able to have a solid strategy based on their processes and products.

Moreover, managers need to realize their critical role in the attainment of fit among business, marketing and manufacturing strategies. This role consists on establishing formal and informal ways of communication among them in order to achieve a consensus about the trade-offs involved (or OW/OQ), since they are the key for the relationships of design strategy and manufacturing with marketing and, so, with business strategy.

In order to help such communication and discussion, managers should have cross-functional backgrounds, because of their previous experience or developed by a corporate training, improving their mutual understanding and respect. The idea is that, this way, it will be enhanced the awareness of one “corporate team” seeking for an overall optimization, instead of several “functional teams” that, by optimizing their functions individually, will bring a global sub-optimization.
The tools presented in this thesis are useful not only for checking the alignment/misalignment between strategies but also to create a framework in the discussion between managers, providing them with the necessary terms and concepts to facilitate their dialogue.

Finally, regarding the reward/evaluation system for functional managers, top managers should use a common system for marketing and manufacturing based on profits and not on sales or costs, facilitating the agreement about OW/OQ between these two functions.
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ANNEX - INTERVIEWS QUESTIONNAIRE

Interview marketing strategy manager

A) MARKETING STRATEGY
1. What is marketing strategy for you? Which main issues does it involve? Main objectives? Major difficulties?

B) MARKETING STRATEGY AND MANUFACTURING STRATEGY
1. Role of manufacturing strategy in marketing strategy?
2. Major points of conflict between the two strategies?
3. Role of Product design/development in marketing strategy? And its role to link manufacturing strategy and marketing strategy?
4. How does your function consider the alignment with manufacturing when formulating marketing strategy? Role of managers in such alignment?
5. How to recognize misalignment with manufacturing strategy and how to deal with it (how to re-align)?
6. How do you think it should look like an integrated marketing-manufacturing strategy? Which could be its benefits?

C) MARKETING STRATEGY AND BUSINESS STRATEGY
1. Role of Business Strategy in marketing strategy? And which can be the role of marketing in selecting a suitable business strategy?
2. Major points of conflict between the two strategies?
3. How does your function consider the alignment with business strategy when formulating marketing strategy? Role of managers in such alignment?
4. Does marketing participate in Business Strategy formulation?
5. How to recognize misalignment with business strategy and how to deal with it (how to re-align)?

1. How is the approach in your company to formulate the different strategies (business, marketing, manufacturing and product): sequential or integrative?
2. How do you think marketing-manufacturing-product strategies can be integrated?
Interview manufacturing strategy manager

A) MANUFACTURING STRATEGY
1. What is manufacturing strategy for you? Which main issues does it involve? Main objectives? Major difficulties?

B) MANUFACTURING STRATEGY AND MARKETING STRATEGY
1. Role of marketing strategy in manufacturing strategy?
2. Major points of conflict between the two strategies?
3. Role of Product design/development in manufacturing strategy? And its role to link manufacturing strategy and marketing strategy?
4. How does your function consider the alignment with marketing when formulating its strategy? Role of managers in such alignment?
5. How to recognize misalignment with marketing strategy and how to deal with it (how to re-align)?
6. How do you think it should look like an integrated marketing-manufacturing strategy? Which could be its benefits?

C) MANUFACTURING STRATEGY AND BUSINESS STRATEGY
1. Role of Business Strategy in manufacturing strategy? And which can be the role of manufacturing in selecting a suitable business strategy?
2. Major points of conflict between the two strategies?
3. How does your function consider the alignment with business strategy when formulating manufacturing strategy? Role of managers in such alignment?
4. Does manufacturing participate in Business Strategy formulation?
5. How to recognize misalignment with business strategy and how to deal with it (how to re-align)?

1. How is the approach in your company to formulate the different strategies (business, marketing, manufacturing, and product): sequential or integrative?
2. How do you think marketing-manufacturing-product strategies can be integrated?