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The application of a Resource-Based View perspective to Operations Strategy

Research Master's Thesis submitted by
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ABSTRACT

Multiple requests have been made to link operations strategy with other related field of research. Thus, this thesis is an attempt to answer these calls by analysing if and how a resource-based view application to operations strategy would impact the manufacturing firm; the implications, advantages and drawbacks of such perspective on the operational area of the firm. Through a literature review of both theories, a conceptual and taxonomical analysis is realised. New insights and observations emerge on how the resource-based view can complement the operations strategy. Finally, the thesis ends with a summary of the key elements of the analysis and some suggestions for future research.

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1 INTRODUCTION

The operations management literature has requested several times to integrate operations strategy research with other related fields of study, such as strategic management (Adam and Swamidass, 1989; Miller and Roth, 1994). From this collision of perspectives could emerge innovative insights and solutions filling the gaps that the operations strategy has been challenged with for the past few years (Rungtusanatham and Anderson, 1996). Considering this, one field of study has been of particular interest. Indeed, the resource-based view theory features important complementarities with the operations strategy literature (Pilkington and Meredith, 2009).

First of all, operations strategy views operations as a strategic procedure engaged in the competitive positioning of operational resources and capabilities. Therefore, since the resource-based view is focusing on the acquisition and bundling of unique resources and capabilities that are leveraged to achieve a sustainable competitive advantage, we can easily see how this theory could support the progress of operations strategy as a field of study (Hitt, Xu and Carnes, 2016).

In today's hypercompetitive environment, it has been widely accepted that perceiving operations strategy through a resource-based view perspective could be more profitable for firms (Gagnon, 1999). For example, regarding strategic analysis, Wernerfelt (1984) claimed that a shift of attention should be operated from product market positioning toward the development and leveraging of the unique set of resources and capabilities on which the firm is relying to achieve long-term profitability. Regarding operations analysis, Hayes (1985) reached the same conclusion. He suggested that successful firms were focusing more on the development of basic internal resources and capabilities than on the satisfaction of a specific market position or financial goal. The long and firm-specific process of incremental advances would result in the development of either more general resources and capabilities, like a really precise procedure of quality control, or specific ones with more of a knowledge orientation. Then, as soon as new business opportunities were available, these companies would take

advantage of the ones that were particularly responsive to their unique resources and capabilities (Hayes and Pisano, 1996).

Therefore, firms cannot go on with a market-based view of strategy or it will jeopardise its business strategy, leaving it with fundamental inconsistencies. In the current competitive circumstances, marketing is not entitled anymore to set the priorities and let the operations function align with them. Therefore, a resource-based view could be a nice alternative for firms operating in rougher competitive conditions and also a good solution for changes in operations strategy to happen (Gagnon, 1999).

1.1 PURPOSE & SCOPE OF THE STUDY

Both theories are characterised by an extensive literature. Nevertheless, although they show an obvious potential for complementarity, only a few authors risked themselves to link the two paradigms (Gagnon 1999; Schroeder, Bates and Junttila, 2002; Coates and McDermott, 2002). Therefore, the purpose of this work is to try bridging this gap and expanding our understanding of how the application of the Resource-based view could help the manufacturing function to reach higher levels of hierarchy in strategy making and assist the firm in achieving a sustainable competitive advantage.

Throughout this thesis, the analysis will be focused on the general manufacturing firm which is buying raw materials from suppliers, producing from these raw materials its own products and selling and distributing them to one or several markets. Concerning the resources and capabilities, the scope is narrowed down to these operational assets linked directly to the production system and helping the firms to buy, produce and deliver its products efficiently.
More precisely, **a resource**, according to Daft (quoted in Barney, 1991), can be defined as all the firm attributes, knowledge or information enabling the firm to develop and implement strategies improving the plant's efficiency and effectiveness. We can classify the resources into three different categories. Firstly, the **physical capital** resources including the physical technology employed by the plan, its facilities and equipment, geographic location and access to raw materials. Secondly, the **human capital** resources involving the training, judgement,

intelligence, relationships, and personal experience of each managers and workers in a plant. Lastly, the less related to our subject, the **organisational capital** resources. It concerns the formal reporting structure, formal and informal planning, controlling, and coordinating systems (Barney, 1991).

Capabilities, on the other hand, are "information-based tangible or intangible processes that are firm specific and are developed over time through complex interactions among the firm's resources "(Amit and Schoemaker, 1993, p. 35). They play a major role in making the deployment, allocation and coordination of resources unique and they enable the firm to deal more easily with its daily challenges (Amit and Schoemaker, 1993; Wu, Melnyk and Flynn, 2010).

Lastly, a clear definition of what is a sustainable competitive advantage is also required. A firm is said to enjoy a **sustainable competitive advantage** when it is developing and implementing a value generating strategy which is not being implemented at the same time by any current or potential competitors and when the reason for this is the impossibility to duplicate the advantages of this value-creating strategy (Barney, 1991).
Finally, the terms **operations** strategy and **manufacturing** strategy designate the same and unique concept and will be used interchangeably throughout the thesis.

1.2 THESIS'S QUESTIONS

Thus, to accomplish this, the analysis of the thesis will navigate through the four following research questions:

1) What are the managerial implications of applying RBV to different aspects of Operations Strategy?
2) What are the consequences of applying RBV for the firm-internal role of Operations Strategy?
3) Would RBV yield a different final strategy outcome than a Hill-Skinner type strategy?
4) Under what circumstances would RBV provide application advantages to the firm?

1.3 METHOD

This piece of work will be divided into 5 parts, beginning with this introduction. The second part will consist of a literature review going through the fundamental aspects of both theories. In the third part, to answer the thesis's questions, a conceptual and taxonomical analysis will be conducted in the form of an attempt to integrate the main concepts of both paradigms. This trial will provide great insights on how the RBV application could affect the Operations strategy and its multiple aspects. These insights will then be discussed more deeply in the fourth part of this study, providing appropriate outcomes for managerial implications. Finally, the fifth and last part will try to synthesise the main points of the thesis and propose new directions for future research.

2 LITERATURE REVIEW

2.1 OPERATIONS STRATEGY'S THEORY

2.1.1 WHAT IS OPERATIONS STRATEGY?

First of all, there are three primary levels of strategy in a manufacturing firm. A corporate one, a business one and a functional one. Each of these corresponding roughly to the organisational units responsible for formulating and pursuing each level of strategy (Wheelwright, 1984).

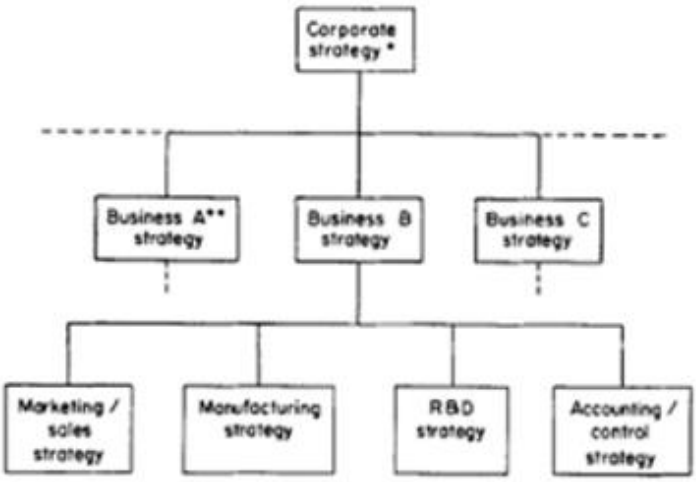

Figure 1: Levels of strategy
Source: Wheelwright, 1984, p. 83

At the level of the Corporate strategy there are two areas of interest to the corporation: the determination of the businesses in which the corporation will operate and the acquisition of corporate resources and their allocation among each of those businesses. In a wide-diversified group, it may be necessary to define a specific strategy for each of several sectors. Thus, the businesses in which the sector or group will and will not participate, and an allocation of resources (Wheelwright, 1984).

At the level of the business strategy there are generally two critical tasks that must be carried out by each *strategic business unit* (SBU). Firstly, the specification of the scope of business in a way that operationally ties the business strategy to the corporate strategy. Thus, defining the product/market/service to be addressed by the business unit. This is important if the

corporation is to avoid competition between its own business units. Secondly, the specification of the basis on which that business unit will attain but also maintain a competitive advantage. For success, this advantage must fit the business unit's resources, the requirements of the product/market/customer segments to be pursued and acknowledge competitors' strategies (Wheelwright, 1984).

At the level of the functional strategy, each function is to support the business unit's strategy. A business might have a wide range of functional strategies like a marketing/sales strategy, a manufacturing strategy, a R&D strategy, an accountability/control strategy, … A functional strategy defines how that function will assist the desired business strategy and how it will fit with the other functional strategies. To be effective, each functional strategy must support the competitive advantage being sought by the business strategy through a consistent pattern of decisions and trade-offs on competitive priorities (Wheelwright, 1984).

The preceding definition of a functional strategy implies that:

> An effective **manufacturing operation** is not necessarily one that promises the maximum efficiency, or engineering perfection, but rather one that fits the needs of the business, that is, one that strives for consistency between its capabilities and policies and the business's competitive advantage. Translating the business strategy into an appropriate collection of bricks, mortar, equipment, people and procedures requires resources, time and management perseverance to ensure that the large number and variety of manufacturing decisions are complementary and mutually supportive (Wheelwright, 1984, pp. 83–84).

According to Schroeder, Anderson and Cleveland manufacturing strategy consists of:

- The **mission** of manufacturing. Refined or derived directly from the business strategy and from the market, the mission defines what operations must achieve for the success of the business unit. It states the purpose of the manufacturing function (Schroeder, Anderson and Cleveland, 1986).

- The **manufacturing objectives**. Measurable terms should be used in order to define the manufacturing objectives as part of the manufacturing strategy. To this extent, the manufacturing function can state specific expected results (Schroeder, Anderson and Cleveland, 1986).
- **Policy areas** for manufacturing. The resources or tasks that must be carried out by manufacturing usually define these policies. Policies formulation should aim to assist the manufacturing objectives and missions. Therefore, the policies should be coherent with each other and reinforce what is intended to be achieved by manufacturing (Schroeder, Anderson and Cleveland, 1986).
- **The distinctive competence.** This is what differentiates manufacturing from the competition. It's what makes the manufacturing function of a firm unique. The distinctive competence gives the ability to manufacturing in dealing with the competition (Schroeder, Anderson and Cleveland, 1986).

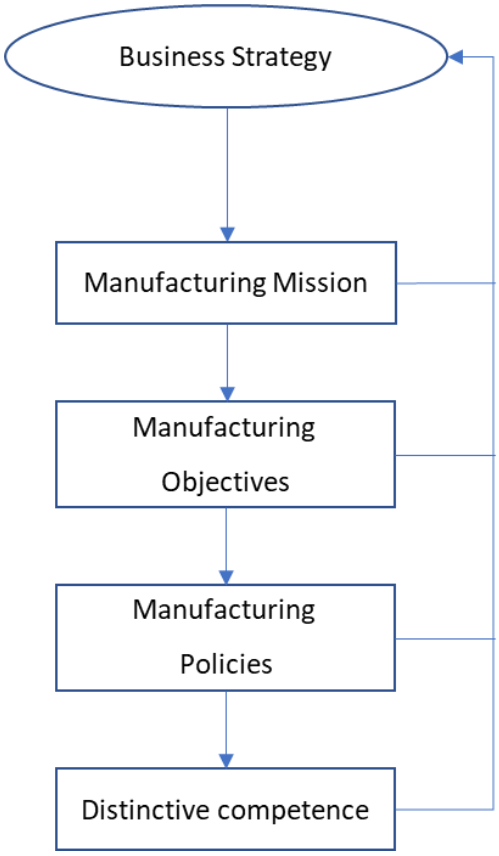

Figure 2: Interactive relationships between business strategy & the different components of manufacturing strategy
Source: Schroeder, Anderson, Cleveland, 1986, p. 413

In other words, the **business strategy** determines the **manufacturing mission**, which subsequently drives manufacturing **objectives**, **policies**, and **distinctive competence**. While this is more of a reactive approach to the manufacturing function, there also exists a more proactive attitude of manufacturing. In that case, elements of the manufacturing strategy influence directly the business strategy. Thus, the relationship is more of an interactive one than a unilateral one as it is demonstrated by Figure 2 (Schroeder, Anderson and Cleveland, 1986).

2.1.2 THE CONCEPT OF FOCUS

According to Skinner (1974), a firm, to compete successfully, need a clearly defined manufacturing mission. This allows manufacturing to assist the overall business strategy by focusing its efforts as effectively as possible. Taking into consideration a specific competitive position, a manufacturing strategy has to make sure that the competences being developed are the right ones. It cannot be expected to perform well by every yardstick. Instead, in order to perform well, manufacturing should concentrate itself on a limited subset of competences (Corbett and Van Wassenhove, 1993).

Within one incoherent set of manufacturing policies, the traditional firm tries to accomplish too many conflicting tasks. The logical result is non-competitiveness. To be competitive, the factory's policies need to be focused on the one key and essential manufacturing task relative to its industry (Skinner, 1974).

Indeed, Skinner stipulates that

> A factory that focus on a narrow product mix for a particular market niche will outperform the conventional plant, which attempts a broader mission. Because its equipment, supporting systems, and procedures can concentrate on a limited task for one set of customers, its costs and especially its overhead are likely to be lower than those of the conventional plants. But, more important, such a plant can become a competitive weapon because its entire apparatus is focused to accomplish the particular manufacturing task

> demanded by the company's overall strategy and marketing objective (Skinner, 1974, p. 114).

According to him, there are three basic concepts fundamental to focused manufacturing:

- There are multiple ways to compete besides by producing at low cost.
- **A firm cannot perform greatly on every yardstick.** There are trade-offs to be made. Certain tasks must be left aside to meet others. Because of the unavoidable limitations of resources, equipment and process technology, tasks cannot all be achieved equally well. Therefore, managers need to know: "What must we be especially good at? Cost, quality, lead times, reliability, changing schedules, new-product introduction, or low investment.
- **Simplicity and repetition breed competence.** Indeed, focuses manufacturing is built on the idea that simplicity, repetition, experience and homogeneity of tasks breed competence. In addition, derived from corporate strategy, the same objectives must be shared by each key functional area in manufacturing. This congruence of tasks provides a manufacturing function that does a few things but very well, thus designing a powerful competitive weapon.

Hayes and Wheelwright (1984) further emphasise the importance of focused manufacturing by stating that

> It is difficult (if not impossible) and potentially dangerous for a company to try to compete by offering superior performance along all of these dimensions, since it will probably end up second best on each dimension to some other company that devotes more of its resources to developing that competitive advantage (quoted in Boyer and Lewis, 2002, p. 11).

The focus factory gives an amazing approach to stop jeopardise each element of the manufacturing system. No strategy, no market nor task can be satisfied with the conventional general-purpose, do-all-plant. Focus provides well-defined objectives which can be easily

understood and incorporated by members of an organisation. It provides a clear sense of direction (Skinner, 1974). Focusing can be viewed as the management practice of conceiving a coherent structure to achieve a strategic task. By centralising their manufacturing policies around one manufacturing task, great benefits could be reaped by factories. The manufacturing task is seen as the mission to meet those particular objectives that would assist the strategic plan of the unit and generate competitive advantage (Skinner, 1996).

2.1.3 RECAP

To summarise, first, a manufacturing strategy is defined by the pattern of decisions and actions actually made by managers and not necessarily by what the business says its manufacturing strategy should accomplish. Second, for the manufacturing strategy to be effective, that pattern should be consistent in assisting the desired competitive advantage and hence the business strategy. Third, despite the fact that individual decisions are usually taken on behalf of specific products, markets or technologies, over the long term the main purpose of a manufacturing strategy is to mobilise and develop the set of manufacturing capabilities that will support the business in pursuing its current and future strategy and gaining a sustainable advantage over its competitors. The capacity to translate specific decisions into the development of general capabilities is an important management skill which is central to developing and implementing effective manufacturing strategy (Wheelwright, 1984).

In more explicit terms, at the level of operations, the decisions to be made usually involve cost, quality, variety, responsiveness … and result in the commitment to few specific priorities or a manufacturing task that should subsequently drive decisions concerning facilities, capacity, technology, quality management, and other important choices (Skinner, 1974). Hayes and Wheelwright (quoted in Demeester, De Meyer, Grahovac, 2014) pointed out that this approach to manufacturing strategy implies a top-down method in which business level strategy drives competitive priorities for the operations function.

Finally, focused manufacturing must be drawn from a clearly and well-defined corporate strategy. Therefore, the choice of focus should not be taken independently by production

people. Instead, an extensive analysis of the company has to be made. Aspects of the firm like its resources, strengths and weaknesses, position in the industry or the assessment of competitors' moves, and forecast of future customer motives and behaviour have to be precisely identified. Reciprocally, the choice of focus should not be made without taking into account the existing factory. Indeed, a given set of facilities, systems, and people skills can only perform well on certain aspects of manufacturing and within a given period (Skinner, 1974).

The operations strategy's literature is divided into two main approaches. Firstly, the content approach of operations strategy is concerned with the particular decisions regarding competitive priorities, objectives, and action plans that define the operation's strategic direction (Kim, Sting and Loch, 2014). Secondly, according to authors like Slack and Lewis or Swink and Way, "the process approach of operations strategy comprises the activities and dynamics of strategy formation and implementation" (quoted in Kim, Sting and Loch, 2014, p. 2). Now, I'll get into more details about the multiple elements of these two approaches.

2.2 THE CONTENT APPROACH

2.2.1 COMPETITIVE PRIORITIES

According to Skinner (quoted in Boyer and Lewis, 2002), competitive priorities are a key decision variable. They express a strategic emphasis of the firm on developing certain manufacturing capabilities in the aim of improving a plant's position in the marketplace. Such emphasis is meant to drive decisions concerning the production process, capacity, technology, planning, and control. A lot of researchers perceive operations strategy as determined by the relative weighing of competitive priorities, including cost, quality, flexibility, and delivery. Compromises have to be made by plants given that cost, quality, flexibility and delivery capabilities need distinct operational structure and infrastructure for support (Boyer and Lewis, 2002).

Boyer and McDermott explained that:

> the critical factor in determining strategic success is not necessarily which priority is emphasised (e.g., flexibility or low costs), but whether the priority is translated into a consistent pattern of decisions that help develop the capability into a competitive advantage (quoted in Boyer and Lewis, 2002, p. 18).

Each of these competitive priorities are described below:

- **Cost:** Referring to the sum of all costs incurred by the firm engaged in developing, producing, delivering, servicing, and disposing of the product (Corbett and Van Wassenhove, 1993), manufacturing cost-related dimensions include production costs, productivity, capacity utilisation, inventory costs (Wheelwright, 1984) … Low-cost producers will pursue waste reduction and productivity increasing, often by designing and implementing line flow systems composed of relatively fixed machinery and standardised operator tasks (Boyer and Lewis, 2002).
- **Quality:** This dimension is concerned with all physical aspects of the process and product or/and service delivered by the firm (Corbett and Van Hassenhove, 1993). Plant emphasising quality is more concerned in providing high quality standard product or a product composed by features or performance attributes that are not found in competing products. While discussing quality, it is important to make the distinction between actual quality and perceived quality. The latter is more related to marketing and the ability to sell and advertise the product. A second differentiation has to be made between quality defined as the absence of defects and quality defined in terms of performance capabilities (Wheelwright, 1984).
- **Delivery:** There are two aspects to delivery: **delivery reliability** and **delivery speed**. According to Hill, **delivery reliability** is the capacity of a firm to deliver an order on or before the agreed on the due date (quoted in Handfield and Pannesi, 1995). In this case, the business unit probably do not possess the least costly nor the highest quality product, however, based on its superior ability to reliably deliver products when scheduled, the business unit will still be able to compete (Ward and Duray, 2000). Hill defines **delivery speed** as a firm ability to deliver an order faster than its competition

or satisfy a required delivery date while only a couple or even none of its competitors can do so (quoted in Handfield and Pannesi, 1995). Although the two dimensions can be taken separately, over the long run a plant will need to be able to deliver quickly with a high degree of reliability in order to succeed (Ward, Bickford and Leong, 1996).

- **Flexibility:** Similarly, to delivery, flexibility can be divided into two main dimensions: **product flexibility** and **volume flexibility**. On the one hand, competing on the basis of **product flexibility** will require the ability to manage difficult, non-standard orders and to lead in new product introduction. On the other hand, businesses that compete through volume flexibility will focus on their ability to accelerate or decelerate production very quickly (Wheelwright, 1984). Highly flexible plants may orientate themselves toward a job shop design, looking for fast response to varying customer demands and product specifications (Boyer and Lewis, 2002).

In his article *Manufacturing Strategy: Defining the missing link*¸ Wheelwright gives a nice summary of the concept of competitive priorities:

> Within a given industry different companies (different **business units**) emphasise each of these four competitive dimensions – **price**[1], **quality**, **dependability**[2] and **flexibility** – to varying degrees. It is both difficult (if not impossible) and potentially dangerous for a company to try to compete by offering superior performance along all of these dimensions simultaneously. Instead, a business must attach definite priorities to each, and those priorities determine how that business will be positioned relative to its competitors - in terms of its **competitive advantage**. It is the specification and clarification of these priorities and their pursuit in the manufacturing function that determine the competitive role of that function… Unless these **trade-offs** are made in a **consistent manner over time**, the business will slowly lose its competitive distinctiveness. Without such consistency, it does not matter how much effort the organisation puts into formulating and expounding its strategy; it will not have an efficient one (Wheelwright, 1984, p. 81).

[1] In this passage, price corresponds to cost.
[2] In this passage, dependability corresponds to delivery.

2.2.2 DECISION CATEGORIES

While manufacturing strategy must be extensive in its content, the intricate network of decisions that it's made of must be broken down into analysable pieces. Fine and Hax designed a framework displaying nine of these analysable pieces. Their model is composed of the following decisions categories: facilities, capacity, vertical integration, processes and technologies, scope and new products, human resources, quality, infrastructure, and vendor relations (Fine and Hax, 1985).

Because of their long-term effects, the first four decision categories are considered as structural or strategic in nature. Indeed, plants will have difficulty of changing or undoing them once they are in place. Furthermore, these decisions often require substantial capital investment to implement, alter or even extend. The last five decision categories demonstrate a more tactical orientation. They usually do not require large capital investments at a single point in time and they embody a multitude of on-going decisions that need to be linked to particular operating aspects of the business (Wheelwright 1984). However, Hayes stated that they are still critical to the success of the manufacturing strategy as the cumulative impact of patterns of decisions in these categories can be as challenging and expensive to alter than the first four categories (quoted in Wheelwright, 1984).

The structure and capabilities of a manufacturing organisation are defined by the collective pattern of decisions in these nine categories. Consequently, a manufacturing organisation will be able to do several things well but perform poorly on a bunch of other things. This intrinsic set of strengths and weaknesses stems directly from the patterns of decisions pursued by the organisation (Wheelwright, 1984).

The characteristics of the different decisions categories are summarised below.

Structural decision categories:

- **Facilities:** There are three key elements to consider while devising policies about facilities: the size, the location and the focus of the facility (Wheelwright, 1984).

Skinner stated that when managing a multifacility organisation, the key step is to choose how to specialise or focus each facility (quoted in Fine and Hax, 1985). Subsequently, a well-thought-out strategy for facility focus naturally provides a clear direction to the firm in defining the size, location, and capabilities of each facility. Facilities can be focused on the basis of geography, product group, process type, volume, or stage in product lifecycle. This decision usually depends on the economics of production and distribution (Fine and Hax, 1985).

- **Capacity:** Capacity and facility decisions are closely related. Indeed, capacity is highly dependent on the plant, equipment, and human capital managed by the firm. Crucial decisions regarding capacity deal with whether to add capacity in anticipation of future demand or to answer the current demand, how to handle capacity decisions to influence the capacity decisions of competitors… (Fine and Hax, 1985)
- **Processes and technologies:** According to Hayes and Wheelwright, the traditional approach to process and technologies decisions consists of choosing among the primary generic process type (project, job shop, batch, assembly line, continuous flow) and matching those process characteristics with product features (Fine and Hax, 1985).
- **Vertical integration:** Operations managers are the first one in line to get affected by decisions to integrate vertically. That's because they are the one in charge for integrating and coordinating the bigger more complex structure that arises from them. Such decisions consist of taking a market mechanism over which the operations managers have restricted control and replacing it with an internal mechanism, which is their sole responsibility. Ahead of taking such decisions, a firm has to make sure that it can conceive and manage an internal mechanism that will be more efficient than the market it takes over. The critical element for success of integrated operations is not ownership of the series of productive processes but their management and coordination in the acquiring firm (Fine and Hax, 1985).

Infrastructural decision categories:

- **Scope and new products:** The range of products and processes (Skinner, 1974) as well as the rate of new products introductions influence highly the level of complexity of the manufacturing management task. When managing rapid frequent product

introductions or broad product lines, firms must set up flexible, responsive, efficient manufacturing organisations (Fine and Hax, 1985).

- **Human resources:** According to Peters and Waterman, the most critical and complex aspect of a firm to manage are the human assets (quoted in Fine and Hax, 1985). Hax stated that in human resource management, principal concerns are selection, promotion, and placement of personnel; appraisal of employee performance; rewards and motivational support; management development; and employee relations (quoted in Fine and Hax, 1985). The role of human resource managers is to create policies to drive employees to collaborate as an efficient team to accomplish the firm's goals. A well-define system will integrate all these elements to promote quality, efficiency, and employee satisfaction (Fine and Hax, 1985).
- **Quality management:** Quality can be divided into two categories: design quality and conformance quality. In terms of manufacturability, manufacturing managers should be concerned with design quality. However, their most central role is conformance quality. Important topics regarding conformance quality are quality measurement and allocation of responsibility for quality (Fine and Hax, 1985).
- **Manufacturing infrastructure:** A strong and stable organisational infrastructure is required to assist the decision-making and implementation. Other crucial elements are planning and control systems, operating policies, and well-defined lines of authority and responsibility. The manufacturing organisation is also responsible for decisions on materials management, production planning, scheduling, and control. The key aspect in implementing the delivery systems is whether the system should produce to stock or to order. As scheduling is complex, flexibility is critical in a make-to-order configuration. The system should be able to answer immediately to varying customer requirements. Generally, make-to-stock shops are less often under pressure since they enjoy finished goods inventories to relieve the production operation from customer demand; however, this system generates considerable holding costs (Fine and Hax, 1985).
- **Vendor relations:** The two most popular school of thought regarding purchasing and vendor relations strategy are the competitive approach of Porter (1980) and the cooperative/Japanese approach described by Schonberger (1992). These two views are diametrically opposed. On the one hand, the competitive approach suggests

establishing multiple sources for material inputs. Several firms will compete with each other to win supply contracts. All of these contracts will formally take into account many contingencies. Firms must keep away from supplier dependence as far as possible. On the other hand, the cooperative approach suggests establishing long-term and trustworthy relationships based on mutual dependence. Therefore, single sourcing is a common thing. In case of inadequate performance, suppliers are provided with guidance and training for improvement. Since contract are informal, most contingencies will be dealt with as they happen (Fine and Hax, 1985).

These decisions are points at which key trade-offs are made. Therefore, it is crucial that they are consistent with the decisions taken at other points in time and in other categories. Progressively, they must lead to the type of manufacturing strategy and capabilities necessary for the business strategy to be effective. It is this pattern of structural decisions over time that constitutes the 'manufacturing strategy' of a business unit. In simpler terms, the manufacturing strategy enables the business unit to reach its intended competitive advantage (Wheelwright, 1984). Manufacturing managers have to keep in mind that such choices not only influence the current firm's operations, but also have important, and fairly predictable, repercussions on its ability to acquire new operating capabilities in the future (Hayes and Pisano, 1996).

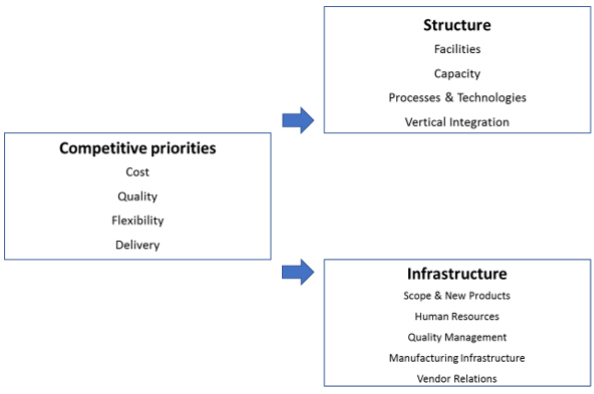

Figure 3: A model of operations strategy: Priorities driving structural and infrastructural decision categories
Source: Boyer and Lewis, 2002, p. 10

Finally, Leong, Snyder and Ward proposed that the success of a manufacturing strategy is defined by the level of consistency between emphasised competitive priorities and analogous decisions concerning operational structure and infrastructure (quoted in Boyer and Lewis, 2002). In developing operations as a competitive weapon, it is critical to match the plant's practices to its competitive priorities (Boyer and Lewis, 2002).

2.2.3 COMPETITIVE PRIORITIES' RELATIONSHIP

Although the general framework for operations strategy has been well defined (Boyer and Lewis, 2002), and fairly robust despite the years passing by, a transition to a totally different industrial competition horizon, and a constant flow of questions and scepticism (Hayes and Pisano, 1996), debate over competitive priorities' relationship still goes on. This argument concerns three perspectives: the trade-off, cumulative and integrative models (Boyer and Lewis, 2002).

2.2.3.1 THE TRADE-OFF MODEL

First postulated by Skinner (1969), the trade-off model is the most established of them all. This model suggests that companies must decide which competitive priorities should be granted with the most investment of time and resources. As stated by Hayes and Wheelwright, managers are responsible for choosing a manufacturing priority and then allocate their limited resources accordingly (quoted in Boyer and Lewis, 2002). Afterwards, Skinner suggests that they must design and implement the corresponding manufacturing system, working intensively on the development of assets and routines that will support them in reaching their objectives. As said earlier, each competitive capability involves different operational structure and infrastructure for support, therefore plant should only focus on one priority at a time (Boyer and Lewis, 2002).

In order to determine which competitive priorities to focus on, Hill (1992) introduces the notion of qualifying criteria and order-winning criteria. First of all, he suggested that a firm must at least satisfy the qualifying criteria of a market in order to enter and remain in this market. However, this will not enable the firm to win orders, it will barely avoid the company

from quickly losing orders to its competitors. Following the fulfilment of these qualifying criteria, the firm has to turn its focus on these order-winning criteria by achieving above superior performance on one or two competitive dimensions highly valued by the market. Still, attaining superior performance on one or two competitive dimensions will mean nothing if the qualifying criteria required by the market are not met on the other dimensions. There is a minimal threshold to be met in order to remain sustainable in business. Therefore, competitive priority choices should be carefully aligned with what the market desires. The qualifying criteria and order-winning criteria concept is mainly concerned with conditions for competitiveness, but these can be turned into competence requirements that can be found in the manufacturing mission (Corbett and Van Wassenhove, 1993).

2.2.3.2 THE CUMULATIVE MODEL

In contrast, proponents of the cumulative model, like Corbett and Van Wassenhove (1993), declare that intense global competition and advanced manufacturing technologies made trade-offs inappropriate. This model argues that competences are not mutually exclusive. Instead, competitive priorities are regarded as complementary, as an existing capability could reinforce the development of other capabilities and improve the overall performance. *World Class Manufacturers*[3] are the perfect illustration of this concept as they excel along multiple dimensions.

According to the advocates of the cumulative model, there are two reasons that make trade-offs neither desirable nor necessary. First, globalisation of the competition has put more pressure on plants to develop along all four dimensions. Again, *World Class Manufacturers* achieved this by improving capabilities that strengthen one other. The most notorious case, as reported by Schonberger, is of high quality allowing firms to enhance their responsiveness to customer needs, their reliability in terms of delivery, and their efficiency in terms of costs

[3] General term to designate firms which are characterised by best practice in total quality, lean production, manufacturing systems, logistics, organisation and practice (Voss, 1995).

(quoted in Boyer and Lewis, 2002). Second, advanced manufacturing technology (AMT)[4] makes it possible for plants to improve different capabilities simultaneously as, according to Corbett and Van Wassenhove (1993), they enable plants to produce diversified customised products with greater precision, speed and efficiency (Boyer and Lewis, 2002).

Ferdows and De Meyer (1990) support this model and even propose a sand cone model. It consists of developing capabilities sequentially, beginning with high quality (Boyer and Lewis, 2002). Indeed, the two authors view quality as a prerequisite to all lasting improvements in manufacturing performance. Once the basis for quality has been set up, a firm can start to also turn its focus toward delivery. In the meantime, the firm should keep developing its quality improvement efforts. Afterwards, while still strengthening contradictory attempts to enhance quality and delivery, flexibility improvement should be included in the mix. In the end, while all the previous capabilities are still being developed at an increasingly higher pace, cost reduction programs can be added (Corbett and Van Wassenhove, 1993). Once minimum performance of the preceding capabilities has been reached, the subsequent capability becomes the main focus of development (Boyer and Lewis, 2002).

2.2.3.3 THE INTEGRATIVE PERSPECTIVE

The integrative perspective attempts to make the two other models come together. Its proponents claim that both the trade-offs and cumulative models bring answers to different aspects of operations strategy. According to Schmenner and Swink (1998), they both study operations strategy from distinctive, but potentially complementary perspectives. They propose that “the law of trade-offs is reflected in comparisons across plants at a given point in time, whereas the law of cumulative capabilities is reflected in improvements within individual plants over time. The two laws are not in conflict” (quoted in Boyer and Lewis, 2002, p. 12).

[4] General term referring to computer-based technologies solution enabling the firm to be more flexible and efficient (McDermott and Stock, 1998).

In order to integrate both models, they go further by explaining that plants are characterised by an operating and an asset frontier. The asset frontier is defined as the maximum performance achievable based on a plant's structure which englobes all the major physical investments. Given a set of assets, the operating frontier is defined as the performance achievable thanks to infrastructural choices which englobes the major operating policies. This means that more operational choices will be available to plants as far as they are from operating on their asset frontier. Consider a major technological change which extends the asset frontier, this extension will provide more space for progress allowing plants to improve multiple capabilities simultaneously, which corresponds to the cumulative model. Yet, as a plant gets more and more close to its asset frontier, and thus becomes fully utilised, more resources are needed to develop capabilities increasing the need for focus. Therefore, while operating near their asset frontier, the trade-off model is more adequate (Boyer and Lewis, 2002).

The progress in the management and technological fields have certainly altered the nature of trade-offs by moving the overall performance frontier forward (Boyer and Lewis, 2002). However, through their structural and infrastructural policies, managers are still getting challenged with critical trade-offs, but now these are more subtle as they do not only concern competitive dimensions themselves, but also their rates of improvement (Hayes and Pisano, 1996).

As Skinner nicely puts it

> The purpose of manufacturing strategy is to design the expensive, time-consuming, relatively inflexible structure of a manufacturing system. A design of anything involves taking into consideration the physical, technical, informational, and human realities that exist and limit the performance of the system. Those limitations keep changing, but cannot be ignored without peril to the success of the design. So, the objective in MCS is to identify, quantify, and make as precisely as possible the strategically important performance objectives and the relationships between them, learning when they conflict or relate and need to be 'traded off' against each other… So, while trade-off relationships change and performance on most criteria improves with new technologies, this does not mean that trade-offs go away. The trade-offs will be different in kind, their mathematical

> relationships altered, and new and different performance criteria become more important for success or failure (Skinner, 1996, pp. 8–9).

2.2.4 ALIGNMENT

Skinner (1974) is the one who implicitly conceptualised first the need for alignment of competitive priorities throughout the manufacturing organisation. The condition for alignment achievement is the presence of a consensus at various levels of the firm within an organisation regarding what is most important for the organisation success (Boyer and McDermott, 1999). More explicitly, alignment is "the level of agreement within an organisation regarding the relative importance of cost, quality, delivery and flexibility to the organisation's operational goals, as well as the relationships between these competitive priorities and operational policies" (Boyer and McDermott 1999, p. 290).

There are two categories of alignment:

1) Internal fit which, according to Skinner (1974), is referring to the consistency between the manufacturing task and manufacturing policies and practices (Joshi, Kathuria and Porth, 2003).
2) External fit stems from the idea of Skinner (1969) that a firm need to align operations strategy with business and corporate strategies (Joshi, Kathuria and Porth, 2003).

Ward and Bickford (quoted in Joshi, Kathuria and Porth, 2003) stated that achieving alignment is presumed to bring enhanced performance for the organisation, just as misalignment is expected to deteriorate performance. Supporting this assumption, Lingle and Schiemann stated that "effective organisations are organic, integrated entities in which different units, functions and levels support the company strategy and one another" (quoted in Joshi, Kathuria and Porth, 2003, p. 354). Meaning that, in theory, each level of strategy, and strategic priorities are consistent, linked, and mutually supporting (Joshi, Kathuria and Porth, 2003).

2.2.4.1 ALIGNMENT AND MANUFACTURING STRATEGY

At the functional level, strategic priorities have to align with and support business level strategies (Joshi, Kathuria and Porth, 2003). According to Skinner (quoted in Joshi, Kathuria and Porth, 2003), the manufacturing strategy has to be developed and implemented in total alignment with the firm's goals and strategies. Hayes and Wheelwright (quoted in Joshi, Kathuria and Porth, 2003) have also argued that a positive repercussion on performance can be drawn from alignment between a firm's strategies at the business and functional levels. They explained that "Manufacturing can be a formidable competitive weapon if managed properly, and the key to doing that is the development of a coherent manufacturing strategy works in unison with business strategy" (quoted in Joshi, Kathuria and Porth, 2003). Therefore, high degree of alignment together with an appropriate strategy will lead to superior performance (Boyer and McDermott, 1999).

2.2.4.2 ACHIEVING ALIGNMENT

The firm needs an operations strategy which is clearly defined, broadly understood and enable flexibility to adapt to changes in the environment. Therefore, the manufacturing organisation should provide a general framework for individuals in order to breed alignment. For a strategy to be effective it must be appropriate, meaning well-fitted to its competitive environment but it must also be communicated and widely shared throughout the organisation (Boyer and McDermott, 1999). Indeed, "since operating decisions are made thousands of times per day by virtually every individual in the organisation, a crucial prerequisite to effective decision-making is that everyone has a shared understanding of the organisation's operations strategy" (Boyer and McDermott, 1999, p. 290).

However, another critical factor for developing alignment is a clear definition of strategic objectives and how they are measured. Without detailed strategic plan, a poor alignment of priorities between groups of individuals within an organisation may appear, resulting in a strategy that is quite different from the one that was initially intended. This is because these groups may work to pull the organisation in different directions (Boyer and McDermott, 1999).

As a result, organisations require some combination of a detailed strategic plan and a more general framework in order to achieve alignment. Indeed, a highly structured, largely written strategy equips employees with a detailed roadmap to follow accurately. However, it is often inflexible in responding to environmental changes and may not be truly shared and understood all employees.

In contrast, a strategy whose main elements are broadly disseminated and genuinely felt by all individuals in the organisation, enable firms to adapt to environmental changes and should demonstrate better performance. A detailed strategic plan is still central for a successful operations strategy due to its ability to guide high level, long-term and expensive decisions. However, it cannot pretend to be detailed enough to provide clear guidance for every decision that must be made on a daily basis. The total of operating decisions that must be made on a daily basis makes it impossible for the firm to definitely specify a method for making every decision. Therefore, a more general framework is also needed, one that provides comprehensive direction for numerous 'fuzzy' decisions where the organisation's detailed strategy cannot possibly give a definite course of action in thousands of different situations (Boyer and McDermott, 1999).

2.3 THE PROCESS APPROACH

2.3.1 THE PROCESS OF OPERATIONS STRATEGY FORMATION

There are two broad schools of thoughts regarding the operations' strategy formulation process. On the one hand, theory stipulates that manufacturing tasks should assist the organisation in achieving its corporate objectives, as a company's favoured positioning in the market should define the competitive priorities of operations (Skinner, 1969). Therefore, operations strategy formation has been represented as a top-down process, where its formulation and implementation should be comprised within the guidelines of overall corporate strategy (Kim, Sting and Loch, 2014). In contrast, multiple authors like Barnes or Slack and Lewis (quoted in Kim, Sting and Loch, 2014) support the existence of an alternative process which emerges more favourably in the absence, or lack of a clear corporate, or strategic business unit, strategy, the bottom-up process.

2.3.1.1 TOP-DOWN PROCESS

As described by Kim and Arnold (quoted in Kim, Sting and Loch, 2014), the top-down process consists of the planned management of intentions and actions to achieve particular goals set by a central authority. In this context, top management establishes its long-term objectives, intentions and means before taking actions (Kim, Sting and Loch, 2014). It corresponds to the very detailed strategic plan that each organisation needs in order to guide its high level, long-term and expensive decisions. According to multiple authors like Bower, Burgelman, Mintzberg and Waters (quoted in Kim, Sting and Loch, 2014, p. 464), this plan should be translated into a set of collective actions aligned with the transparent central authority intents. Based on its initial outcomes, the detailed strategic plan is appropriately reinforced or modified by top management (Kim, Sting and Loch, 2014).

2.3.1.2 BOTTOM-UP PROCESS

In contrary, as explained again by Bower, Burgelman or Mintzberg and Waters (quoted in Kim, Sting and Loch, 2014), a bottom-up strategy may emerge from an unplanned pattern of decisions and actions that may ply realise outcomes not initially intended by top management. However, as remarked by Mintzberg and Waters (quoted in Kim, Sting and Loch, 2014), no action occurs in the total absence of intention. Indeed, top management may propose some broad direction and intentionally refrain from defining a detailed course of actions for every operational decision that have to be made daily (Kim, Sting and Loch, 2014). This corresponds to the more general framework that should be widely disseminated throughout the organisation enabling the firm to be more flexible in the face of environmental changes. In this context, Burgelman and Grove (quoted in Kim, Sting and Loch, 2014) explained that middle managers can autonomously undertake strategic initiatives to establish specific actions that will serve their objectives as long as these objectives are aligned with firm's broad directions. According to Slack and Lewis (quoted in Kim, Sting and Loch, 2014), a bottom-up perspective of operations strategy has the effect of shaping objectives and action through the knowledge that lower-level workers gain from their day-to-day activities.

In sum, a top-down strategy and a bottom-up strategy differ in terms of the initiative's origin and the series of events regarding the intentions, actions and outcomes. On the one hand, top-down strategy is sparked by top management's intentions and manifests in the performance results of established actions. Bottom-up strategy is triggered by lower managers' actions portraying their own interpretations of the company's directions, which may partially differ from top management's initial intentions (Kim, Sting and Loch, 2014).

2.3.1.3 TOWARD AN INTEGRATIVE PROCESS

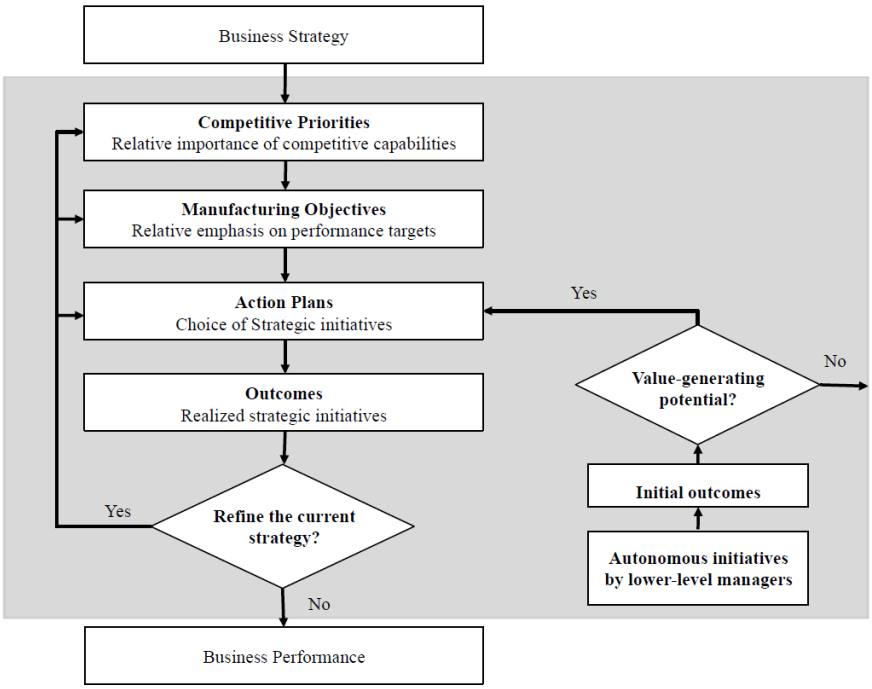

Figure 4: An integrated model of the operations strategy formulation process
Sources: Kim, Sting & Loch, 2014, p. 469

In conclusion, analogous to the Alignment section conclusion, the operations strategy should be formed through an iterative process of integrating competitive priorities, objectives, and action plans that are partially initiated by top-down planning and partially arise from bottom-up learning. Top-down action plans are the reflection of the top management's long-term objectives with regard to the organisation's specified priorities while bottom-up action plans tend to arise in the areas of operational practices and processes pursuing diverse opportunities for improvement. Bottom-up action plans tend to be outside top management's main focus and represent more the expertise and tacit knowledge of lower level workers. Regardless of their origins, all action plans should be evaluated based on their contributions

to the organisation's objectives. Therefore, top-down and bottom-up actions plan play complementary roles in the formation of operations strategy (Kim, Sting and Loch, 2014).

2.4 THE RESOURCE-BASED VIEW'S THEORY

2.4.1 WHAT IS THE RESOURCE-BASED VIEW?

The strategic management field is organised around one main research question: *Why do some firms persistently outperform others?* This question implies that in some cases, persistent performance differences will exist between firms, and these differences cannot be analysed nor explained by traditional economic theories of performance. These traditional economic theories suggest that usually performance differences among firms should be uncommon and certainly not persistent. When, they exist theories justify this by the presence of anti-competitive collusive or monopolistic actions on the part of firms. The resource-based view (RBV) has come up as one of multiple important explanations of persistent firm performance differences in the field of strategic management (Barney and Arikan, 2001).

By analysing firms from the resource side rather than from the product side, we can say that the RBV rather takes an introspective stance on why organisations succeed or fail (Wernerfelt, 1984). In seeking to explain the degree to which an organisation may be able to sustain a competitive advantage, the theory takes the resources hold by the firm as the unit of analysis (Lockett, Thompson and Morgenstern, 2009).

The RBV theory considers that "firms are profit-maximising entities directed by boundedly rational managers operating in distinctive markets that are to a reasonable extent predictable and moving towards equilibrium" (Bromiley & Papenhausen, 2003, pp. 420–421). The RBV theory also accepts that information about the future value of a resource is asymmetrically distributed. If the firm's managers are able to assess the future value of a resource better than their competitors or in more rare circumstances are simply lucky, this provides their firms with *ex-ante* [5] sources of sustainable competitive advantage (SCA) (Kraaijenbrink, Spencer and Groen, 2009). Finally, the development and implementation of isolating mechanisms that

[5] In other words, potential to obtain a SCA.

preclude other firms from competing superior rents away provide the firm with *ex-post*[6] sources of SCA (Mahoney, 1995).

Two assumptions are fundamental to the RBV: (1) resources are distributed heterogeneously across firms, and (2) these productive resources cannot be transferred from firm to firm without cost so that heterogeneity can be long-lasting. These assumptions are the axioms of the RBV. Two elemental arguments can be drawn from these assumptions.

First, resources that are both valuable and rare can produce competitive advantage. Valuable resources are crucial for firm efficiency and effectiveness as they enable the organisation to exploit opportunities and neutralise threats in its environment. Rare resources are limited in supply and not balanced in terms of distribution along the firm's current and potential competition. Second, when such resources are also simultaneously not imitable and not substitutable, those resources may become sources of competitive advantages that are sustainable (Barney, 1991). Inimitability refers to the degree to which resources are difficult to reproduce by other firms. Dierickx and Cool (quoted in Barney, 1991, p. 107) propose that social complexity can be a reason for that. Other Factors like causal ambiguity[7] and specific historical circumstances surrounding the resource development or acquisition may also be involved. Non-substitutability of resources implies that one resource cannot be simply replaced by another one in order to conceive of and implement the same strategies as efficiently or effectively as the original resource.

These types of resources are called VRIN resources – valuable, rare, inimitable and non-substitutable and they are more likely to become the sources of sustainable competitive advantage (Barney, 1991).

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[6] In other words, the ability to protect the newly obtained SCA.

[7] ***Causal ambiguity***, as explained by Barney (quoted in Lockett, Thompson and Morgenstern, 2009, p. 16), "relates to the difficulty faced by outsiders – and perhaps even insiders – in isolating the particular factors responsible for a firm's competitive advantage."

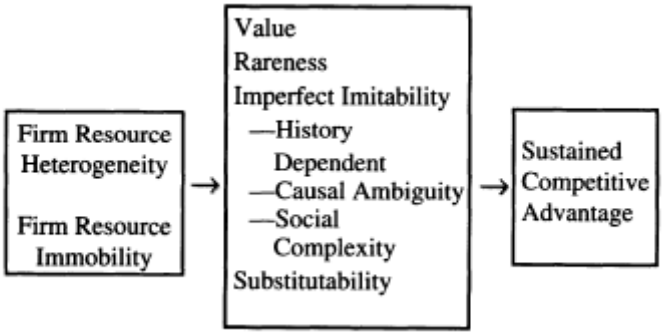

Figure 5: The relationships between firm resources characteristics and sustained competitive advantage
Source: Barney, 1991, p. 112

2.4.2 RESOURCES' MAIN CHARACTERISTICS

Currently the concept of **resources** is described as "the tangible and intangible assets firms use to conceive of and implement their strategies" (Barney and Arikan, 2001, p. 138). Their economic and strategic value varies. Generally, resources are valuable when by using them firms can design and implement strategies lowering the firms' net costs and/or increasing a firm's net revenues beyond what would have been the case otherwise. We can also assess the value of resources in regards with their ability to allow firms to develop and implement strategies that fit the market within which the firm operates (Barney, 1991).

Common tangible resources may include a firm's financial capital like equity capital, debt capital, retained earnings, leverage potential and so on. It could also include physical capital like the machines, technologies, equipment and building that the firm owns. Traditional intangible resources include a firm's human capital like all the training, judgement, intelligence, relationships, experience and insights of individual managers and workers in a firm. Less evident but as much important is organisational capital like the attributes of collections of individuals associated with a firm including a firm's culture, its formal reporting structure, its reputation in the marketplace, etc. (Barney and Arikan, 2001).

In most cases, it's not the leveraging of single resources that enable a firm to develop and implement an efficient strategy, but rather bundle of such resources. Indeed, it can be quite difficult to understand how different resources interact to enable the strategy to achieve competitive success. Therefore, isolating the main sources of these unusual competitive

advantage is highly complex. The advantages that can be drawn from this is the fact that it also keeps away competitors from understanding the sources of this superior performance and prevent them from imitating these valuable networks of resources. Maintaining the competitive distinctiveness is critical. Indeed, a firm that holds valuable bundle of resources does not always demonstrate persistent superior performances. If its competitors own the same resources and employ them to develop and implement the same strategies, these resources will not be sources of a sustainable competitive advantage. Therefore, possessing valuable bundle resources is a necessary, but not sufficient, requirement for firms to gain superior performance. There must be some isolating mechanisms to protect the resources from being simply imitate or substitute (Barney and Arikan, 2001).

2.4.3 STRATEGIC FACTOR MARKETS

Strategic factor markets are defined as the markets where firms acquire or develop the resources they need to implement their product market strategies. If they are perfectly competitive, these markets will anticipate the added-value that these newly acquired resources will produce when used to implement product market strategies (Barney, 1986). This means that even if these valuable resources come in a limited number in a strategic factor market and only a small number of firms can acquire these resources, the product market strategies that will result are likely to yield competitive advantages but no superior economic rents. Indeed, perfectly competitive factor markets will correctly anticipate the value that can be enjoyed from these resources. Therefore, the price that a firm will pay to acquire these resources will reflect their value in implementing a product market strategy. In this case, a firm may enjoy a competitive advantage by being one of a small number of firms implementing a product market strategy, but not earn a superior economic rent (Barney and Arikan, 2001).

Fortunately, strategic factor markets are not always perfectly competitive, enabling some firms to simultaneously enjoy a competitive advantage and earn an economic rent. Strategic factor markets can be imperfectly competitive when (1) the commonly held expectations about the future value of resources underestimate the actual value that can be drawn from them in developing and implementing product market strategies or (2) when a couple of firms holds specific insights regarding the future value of resources than other firms (Barney, 1986).

For the first form of imperfect competition to occur, the market must be characterised by a considerable level of uncertainty regarding the future value of a resource. For the second form of imperfect competition to occur, different firms must possess different expectations about the future value of a resource (Barney, 1986). These distinct expectations are the reflection of the other resources that a firm already controls (Barney, 1991). Indeed, expectations regarding the future value of a resource will also depend on the resources that a firm already possesses and the synergy that can be built by acquiring those new resources.

Taking advantage of opportunities and dodging errors, firms with specific insights will be granted a competitive advantage yielding important economic rents (Barney and Arikan,2001).

2.4.3.1 ACHIEVING SUSTAINABLE COMPETITIVE ADVANTAGE HETEROGENEITY

A fundamental assumption of the resource-based view theory is that bundle of resources and capabilities are heterogeneous across firms (Barney, 1991). In a manufacturing context, we can say that those productive factors in use holds intrinsically different levels of efficiency, thus some are more valuable than others. Firms holding such resources can produce more efficiently and/or better satisfy customer wants and will earn superior economic rents. Heterogeneity in an industry may reflect the existence of superior productive factors which are in limited supply and maybe fixed, meaning that they cannot be expanded anymore. In most cases, they are quasi-fixed, meaning that their supply cannot be expanded rapidly. Thus, inferior resources are brought into production as well. (Peteraf, 1993)

2.4.3.2 EX POST LIMITS TO COMPETITION

The condition of heterogeneity must be relatively long-lasting to add value. If the heterogeneity is a short-lived phenomenon, the competitive advantage will not be sustainable and the economic rents will be fleeting. Therefore, the firm need to put in place some ex-post limits to competition, some forces which will limit competition for those rents. By increasing the supply of scarce resources, the competition may dissipate the profits that could be gained

from such valuable resources. Resource-based view emphasise two critical factors which limit ex post competition: imperfect imitability and imperfect substitutability (Peteraf, 1993).

Rumelt (quoted in Peteraf, 1993) created the term isolating mechanisms to refer to phenomena which protect individual firms from imitation and secure their rent streams. Some are evident like property rights, information asymmetries, and other kinds of frictions which preclude imitative competition. And others seem less obvious like causal ambiguity which is a notion of interest. This refers to uncertainty regarding the causes of efficiency differences among firms (Lippman and Rumelt, 1982). It occurs when a firm drives superior performances from an intricate network of resources and capabilities. In this case, it can be hard for competitors to dismantle this complex network of resources to identify what exactly is the source of this superior performance. Thus, causal ambiguity prevents would-be-imitators from knowing exactly what to imitate or how to go about it (Peteraf, 1993).

According to Rumelt (quoted in Peteraf, 1993), other isolating mechanisms include producer learning, buyer switching costs, reputation, buyer search costs. Dierickx and Cool (quoted in Peteraf, 1993) propose that resources are inimitable when they are subject to time compression diseconomies [8], are causally ambiguous, are characterised by high interconnectedness [9] among asset stocks, or subject to asset mass efficiencies [10]. Such resources are great in limiting imitation as they display a strong tacit dimension and are socially complex. Their development is path dependent meaning that it depends on the previous levels of learning, investment, asset stocks, and development activity. It seems impossible for imitators to find out and repeat the exact developmental process. Importantly, assets of this nature are also immobile and thus bound to the firm.

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[8] ***Time compression diseconomies*** is defined as "the observed tendency of the costs of asset accumulation to rise within a given time interval. The more a firm tries to reduce the time horizon associated with asset accumulation, *ceteris paribus*, the more costly the process will be" (Lockett, Thompson and Morgenstern, 2005, pp. 15–16).

[9] ***Asset interconnectedness*** indicates that "the cost of adding an increment of resource A to the firm's stock may be related to its existing stock of resource B" (Lockett, Thompson and Morgenstern, 2005, p. 16).

[10] ***Asset mass efficiency*** "describes Dierickx and Cool's (1989) proposition that the marginal cost of specific asset accumulation falls with the size of the existing relevant asset base" (Lockett, Thompson and Morgenstern, 2005, p. 15).

Therefore, we can conclude that the resources a firm developed in-house and already controls are more likely to be sources of sustainable competitive advantages and superior economic rents for firms than resources that it acquires from external sources (Barney,1986). Resulting in complex bundles of resources and capabilities, these types of assets prevent competitors to identify the main sources of persistent superior performances, thus impeding imitation and substitutability (Peteraf, 1993).

2.4.3.3 IMPERFECT MOBILITY

Resources are perfectly immobile if they cannot be transferred. More explicitly, Williamson (quoted in Peteraf, 1993) explained that resources are perfectly immobile when they are idiosyncratic to the degree that they have no other use outside the firm. Thus, resources are imperfectly mobile when they are to a certain extent specialised to firm-specific needs. They are closely linked to the firm specific operations and remain available for use over the long run. Thus, they may be a source of sustained advantage. Furthermore, as they play a specific role in the sequence of processes and operations of the firm, their opportunity cost of use is considerably less than their actual value. Such resources are less likely to be imitable than other kinds. But even together with heterogeneity and ex post limits to competition, imperfect mobility is not yet sufficient for sustained competitive advantage (Peteraf, 1993).

2.4.3.4 EX ANTE LIMITS TO COMPETITION

One last condition must be met for a firm to sustain competitive advantages and superior economic rents. There must be *ex-ante* limits to competition as well. Indeed, prior to any firm's establishing a superior resource position, there must be limited competition for that position. A superior and inimitable resource position can only be a source of superior economic rents if some firm have the foresight or good fortune to acquire it in the absence of competition. Otherwise, in the presence of fierce competition for that privileged resource position the anticipated returns will be outbalanced by the costs of acquiring it (Peteraf, 1993).

The economic performance of firms depends not only on the returns that can be drawn from them but also on the cost of developing and implementing them (Barney, 1986).

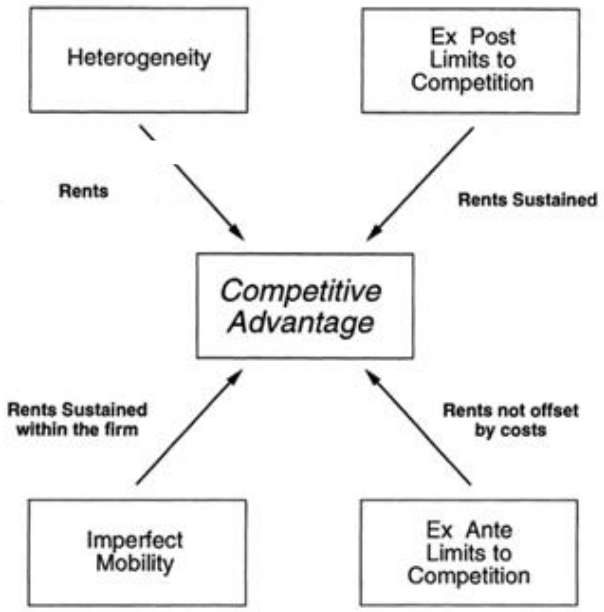

Figure 6: A model of the four necessary conditions for obtaining a competitive advantage
Source: Peteraf, 1993, p. 186

In sum, four conditions must be met for a firm to enjoy sustained superior economic rents. Resource heterogeneity generates rents. Ex-post limits to competition protect these rents from being competed away. Imperfect factor mobility ensures that valuable factors remain with the firm and that the rents are lasting. Ex-ante limits to competition keep costs from negating the rents. Finally, we should keep in mind that how the superior resources are used and the ability of a firm to design and implement a strategy based on resource superiority will in the end determine the efficiency and productivity of these superior resources (Peteraf, 1993).

2.4.4 MANAGERIAL IMPLICATIONS OF THE RBV

According to Mosakowski (quoted in Barney and Arikan, 2001), the resource-based logic can also have important implications for management practice. Indeed, this logic can be employed by management teams who are facing strategic disadvantages and using to achieve a somewhat strategic balance by identifying those valuable and rare resources their firm

currently does not own and analysing if they could be duplicated either through imitation or substitution.

Resource-based logic can also assist managers in firms that have the potential for achieving sustained competitive advantages, but cannot seem to fully realise this potential. By helping managers to understand how resources can be fully utilised to generate sustained competitive advantages, the resource-based logic can be an amazing framework to assess the full range of a firm's resources and then exploiting the most critical resources to finally achieve sustainable competitive advantages (Barney and Arikan, 2001).

Finally, resource-based logic can also be used by managers to ensure that they nurture and maintain those resources that are sources of a firm's current competitive advantages. Competitive advantages for firms are often based on bundles of related resources. Some of these resources are likely to be valuable, but either not rare, or not imperfectly imitable, or not non-substitutable. Armed with this understanding, managers in an organisation may be less inclined to make decisions that have the effect of destroying the very resource that is generating a sustained competitive advantage for their firm (Barney and Arikan, 2001).

3 RESULTS

3.1 WHAT ARE THE MANAGERIAL IMPLICATIONS OF APPLYING RBV TO DIFFERENT ASPECTS OF OPERATIONS STRATEGY?

Firstly, the principal aspect that fundamentally differentiate the two schools of thought is the subject of focus itself.

Indeed, like any other functional strategy, the operations strategy has to support the business's unit strategy. Designing a business strategy consists of first, defining the market, product and/or service that the business will focus on. Secondly, the manufacturing firm will have to determine on which basis it will attempt to achieve and maintain a competitive advantage in this specific product market. Thus, the resources that the firm will need to be able to attain and sustain a competitive advantage (Skinner, 1969, 1974; Wheelwright, 1984). In contrast, by analysing firms from the resource side rather than the product side (Wernerfelt,1984), the resource-based view reverse totally the perspective from which the manufacturing firm derive its strategy. Indeed, the introverted orientation of the RBV will first focus and evaluate the strengths and weaknesses of the plant in order to define the basis on which the plant will compete. And then only, the firm will make decisions concerning the scope of business in order to make the most of the valuable resources that the plant owns (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993).

Therefore, adopting a resource-based view of the firm when attempting to formulate and implement an operations strategy can surely have serious implications on the decision-making process and the strategy that will result from such pattern of decisions. We have, on the one hand, a theory that focus on a market position from which the whole strategy of a firm will derive (Skinner, 1969, 1974; Wheelwright, 1984; Hill, 1992), and on the other hand, a theory that turn its attention toward the resources that a firm owns and on which it will base its whole strategy (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993).

3.1.1 THE MANUFACTURING MISSION

In latter context, the manufacturing mission will be completely different. Instead of being derived from the business strategy and directly from the market (Schroeder, Anderson and Cleveland, 1986), the mission of operations will be oriented toward these resources that enable the firm to achieve a sustainable competitive advantage. To this extent, the purpose of operations will be to either acquire in the strategic factor markets or develop in-house valuable, rare, inimitable and non-substitutable resources (Barney, 1991). Then, the operations function has to make sure that it nurtures and maintains those resources (Barney and Arikan, 2001). To do so, the manufacturing firm will have to put in place some isolating mechanisms to prevent other firms from competing its rents away and protect their resources from imitation and substitution. That's what will make the plant differentiate itself from the competition and enable it to enjoy a competitive advantage for the long-term (Peteraf, 1993; Mahoney, 1995).

This approach presumes that the operations function plays a more proactive role in the process of strategy making of a firm. In this case, by turning the attention toward the unique set of resources a plan owns, the manufacturing mission will influence directly the type of businesses that the firm will invest its scarce resources in (Hayes and Pisano, 1996). Because there still needs to be fit between the resources and the market the firm will operate in (Barney and Arikan, 2001). However, through the RBV lens, the relationship between those two is reversed. The resources of the firm will determine the market(s) in which it will compete (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993).

3.1.2 CHANGE OF FOCUS

By applying the RBV, the manufacturing function will still need to focus its efforts and its policies toward a limited number of manufacturing tasks. There is no firm nor theory that can perform or enable the firm to perform equally well on every yardstick (Skinner, 1974). Therefore, the manufacturing function must focus on acquiring and developing a unique and coherent set of resources allowing the plant to build operational capabilities in order to

perform the manufacturing tasks required for the firm to achieve a sustainable competitive advantage (Skinner, 1974; Barney, 1991).

Taking into consideration a specific resource position (strengths and weaknesses), manufacturing will have to make rational decisions regarding the resources that it wants to invest its time and money in. A kind of synergy is expected between the resources for the plant to perform well. Therefore, the resources already owned have to be taken into account when choosing the new ones to be developed or obtained (Barney, 1991; Barney and Arikan, 2001). Indeed, synergy will benefit the plant in two different ways.

First, synergy between resources will enable the manufacturing function to conceive complex bundle of resources (Peteraf, 1993). Initially, some of these resources might not satisfy the VRIN criteria, however, taken together and embedded in an intricate network of resources they will enable the firm to implement an efficient strategy (Barney and Arikan, 2001). The great advantage of bundles resides in the fact that they are hard to decipher from the competitors' point of view. They cannot clearly define what exactly are the sources that enable the firm to develop and implement its effective strategy (Peteraf, 1993). Therefore, it prevents the competition from imitating those bundles.

Second, focusing on designing a cohesive set of resources will also enable the firm to take advantage of the strategic factor markets. Indeed, firms might have different expectations about the future value of a resource reflecting the other resources that a firm already owns. This relative attractiveness due to synergistic considerations can enable a firm to acquire a resource at a cost lower than the actual value that the firm will derive from it. The manufacturing function should capitalise as often as they can on these types of resources (Barney and Arikan, 2001).

In conclusion, employing an RBV perspective to manufacturing does not change the fact that the focus factory is still an amazing tool to protect operations from compromising itself, by developing and acquiring resources with no links between them whatsoever. Focus provides a well-defined manufacturing mission and a clear direction toward which the members of the firm have to guide their efforts (Skinner, 1974). Keeping coherence between resources is a

requirement for operations success and enables the firm to design and implement an efficient strategy that will support the firm in deploying its resources in the appropriate markets and achieving a sustainable competitive advantage over its competitors (Peteraf, 1993; Barney and Arikan, 2001). By consolidating its manufacturing objectives and policies toward the building of unique bundles of resources and the capitalisation of these lower value resources that yield high relative value considering the resources the firm already controls, huge benefits could be enjoyed by the manufacturing function (Skinner, 1996; Barney and Arikan 2001).

3.1.3 DECISION CATEGORIES AND COMPETITIVE PRIORITIES

Usually, the manufacturing function will first determine the different degrees of emphasise of competitive priorities and then the decisions concerning the structure and infrastructure of manufacturing will reflect the level of weighing of these competitive priorities in the strategy (Boyer and Lewis, 2002). However, by applying the RBV, as the focus is shifted toward the resource position occupied by the firm, thus the resources and capabilities that it already controls, the decision categories will play a more leading role in determining the tasks that the manufacturing function will be able to perform well (Hayes and Pisano, 1996).

3.1.3.1 THE DECISION CATEGORIES

In a sense, decision categories can be viewed as the choices of resources that the firm will develop or acquire. Indeed, taking into consideration decisions regarding facilities or processes and technology, these are tangible and intangible assets that the firm owns and deploys in order to achieve its strategic tasks (Fine and Hax, 1985). Consequently, these are key decisions that will play a crucial role in determining the type of resources and capabilities that the firm will need to acquire and develop in order to attain a competitive advantage. Therefore, they will have to be consistent with the manufacturing mission consisting of acquiring, developing and deploying VRIN resources (Schroeder, Anderson and Cleveland, 1986; Barney, 1991). When making choices regarding the decision categories, the manufacturing function will also have to plan how it will protect these resources and

capabilities from competition imitation and substitutability (Peteraf, 1993; Mahoney 1995, Barney and Arikan, 2001).

A way of doing this could be by emphasising human resources management decisions. In most cases, the workforce of the firm is the first element to be in contact with the resources. By managing them in their daily routines, they are the one who are the most affected by them. Over time, they can gain tacit knowledge regarding those resources. In return, they will apply this knowledge to better use the resources and get better performance out of them (Kim, Sting and Loch, 2014). These types of knowledge add complexity to the capabilities a firm is able to perform, making them hard to imitate or substitute (Peteraf, 1993). To benefits from these capabilities, decisions regarding the Manufacturing infrastructure should promote participation of the workforce into strategic decision-making and encourage them to share their knowledge with the management of the manufacturing firm, as they have better insight on how to use resources and capabilities at their finest (Kim, Sting and Loch, 2014).

In conclusion, similar to the initial operations strategy, it is the pattern of structural and infrastructural decisions that will define the type and value of the resources that the firm will possess and thus the strategy that it will design and implement. For synergy to happen and benefit from it to be enjoyed, this pattern of decisions has to be coherent over time (Wheelwright, 1984; Barney and Arikan, 2001). Finally, another point in common with the usual operations strategy, is that choices regarding this decision does not only influence the strategy now, but will also have repercussions on the type of resources that the firm will need to acquire and the capabilities that it will be able to develop in the future (Hayes and Pisano, 1996).

3.1.3.2 THE COMPETITIVE PRIORITIES AND THEIR RELATIONSHIPS

In this paradigm, the manufacturing function is not designing and implementing a strategy around a market position anymore. This will have a huge impact on the way it views its competitive priorities and their relationships.

By turning its attention toward the unique underlying resources and capabilities that it controls, the manufacturing function will be able to satisfy multiple priorities at the same time (Coates and McDermott, 2002). Indeed, it's pretty easy to demonstrate how a resource or a bundle of resources can have an impact on multiple dimensions over time. Let's assume a manufacturing firm holds specific knowledge and expectations about a machine that could fit perfectly its production system (Barney, 1986). By acquiring this specific machine, the plant will use its exclusive knowledge and synergistic features to get the most of its newly acquired resource (Barney and Arikan, 2001). Then, as soon as the machine will be mastered and well-implemented into the production system, it will enable the firm to improve its productivity; cost (Boyer and Lewis, 2002) by producing more, with a lower rate of defects; quality (Wheelwright, 1984), and faster which will also have an impact on its lead time; delivery (Handfield and Pannesi, 1995).

However, it still does not change the fact that a plant should not try to compete by offering superior performance along all of these dimensions simultaneously (Wheelwright, 1984). By turning its attention on the unique bundles of resources, and not solely on market requirements anymore, to achieve strategic success (Barney, 1991), the firm will be able to improve on multiple competitive dimensions at the same time but at varying degrees, as resources will impact these competitive priorities to various extents (Wheelwright, 1984). The great difference resides in the reversed approach concerning the relationship between resources and competitive priorities (Boyer and Lewis, 2002).

To conclude, the coherent pattern of choices regarding the decisions categories will result in the development of unique and valuable bundles of resources and capabilities that will provide the firm with a competitive edge (Wheelwright 1984; Barney and Arikan, 2001). Therefore, it's at the level of the decision categories and the resources that the firm will choose to develop or acquire that strategic trade-offs have to be made. Trade-offs are required if the firm wants to maintain synergy and not lose its competitive uniqueness. These trade-offs will then be reflected in the levels of performance along the different competitive dimensions (Skinner, 1974; Wheelwright, 1984). This in turn will enable the firm to be aware of how it is positioned relative to its competitors, regarding its competitive advantage (Wheelwright,1984).

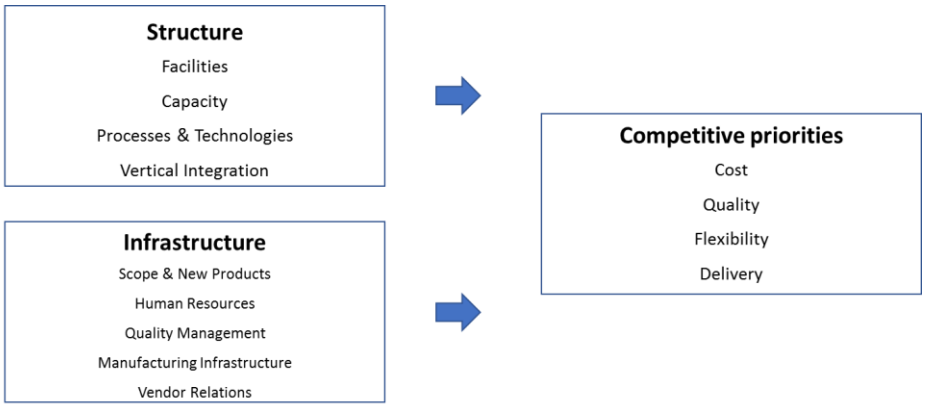

Figure 7: The reversed relationship between decision categories and competitive priorities
Sources: Boyer and Lewis, 2002, p. 10

In the end, instead of focusing on the competitive priorities, the RBV perspective emphasises the firm-specific resources and capabilities which determine the plant's ability to shine in achieving these competitive priorities (Coates and McDermott, 2002).

3.1.4 ALIGNMENT

When employing an RBV perspective, alignment should be focused on the level of agreement regarding the relative importance of the resources and capabilities and how well they fit the production system and policies. In other words, how well they support the firm in achieving a sustainable competitive advantage over its competitors (Boyer and McDermott, 1999). This will help the firm in realising which resources are the most critical. These resources should be given special attention in order to realise their full potential. They should be nurtured and maintain inside the firm as they are the sources of the competitive distinctiveness of the firm (Barney and Arikan, 2001).

Alignment is also important in understanding the different decisions surrounding the firm strategy, policies and objectives in regards of its resources. Indeed, alignment should bring a clear understanding of how the different resources and capabilities interact (Boyer and McDermott, 1999), saving the firm from undermining itself by underestimating and abandoning these at-first-sight-lower-value resources but that brings a lot to the company in interaction with other resources (Barney and Arikan, 2001). By sticking to the manufacturing mission, the firm should keep in mind that their resources and capabilities will be embedded

in synergistic and highly complex network of knowledge and assets which are contributing greatly to the competitive success of the manufacturing firm (Barney, 1991; Peteraf, 1993). The ability of the manufacturing function to support the manufacturing mission is defined by the multiple decisions taken over an extended period of time. A clear understanding of these decisions is needed in order to use them to achieve strategic goals (Wheelwright, 1978).

A major difference from the usual operations strategy is the fact that, for strategic success to occur, the business strategy must be aligned with the manufacturing mission and policies and support the deployment of the bundles of resources and capabilities which represent the core of the manufacturing function. It is crucial as these sets of resources and capabilities will define the type of businesses the firm will be able to compete in, and not the other way around anymore. By aligning its business strategy with the manufacturing mission and policies, the strategic as well as the day-to-day decisions will be made in consistent manner over time and will result in an overall strategic success (Wheelwright, 1984). It is highly important that there be a widespread agreement within the company regarding the overall strategy. Employees at every level of the business unit will make coherent decisions over time, contributing to the development of the valuable, rare, hard to imitate and non-substitutable resources and capabilities that will enable the firm to achieve its strategic tasks and maintain a competitive advantage over the long run (Boyer and McDermott, 1999).

3.1.5 THE STRATEGY FORMULATION PROCESS

As already explained earlier, top-down and bottom-up action plans serve complementary roles in operations strategy (p. 26). While top-down action plans are the reflection of the top management's long-term objectives with regard to the organisation's specified priorities, bottom-up action plans tend to arise in the areas of operational practices and processes pursuing diverse opportunities for improvement (Kim, Sting and Loch, 2014).

In an RBV context, the firm will need that top-down plans stipulate general guidelines, and thus infuse the clear direction that the manufacturing firm wants to take regarding the strategic management of its resources and capabilities. The top-down plans should also

encourage the workers and employees of the firm closely linked to the usage of the resources and capabilities to pursue bottom-up action plans, as they hold tacit knowledge about the resources and capabilities and have a better insight on how these interact (Kim, Sting and Loch, 2014).

Employee-led initiatives do not spark out of anything, but rather in an environment where diverse ideas are valued and can be easily shared among organisational members. That's why it is the role of top managers to establish an organisational environment that encourages employees to try new ideas that could improve their work and that provides communication channels to share ideas with other members in the organisation as well as across organisational hierarchy (Kim, Sting and Loch, 2014).

Finally, the strategy formulation process should integrate mechanisms to gather all this tacit knowledge and formalise it in order to disseminate it throughout the whole firm (Peteraf, 1993). Through employee involvement, cross-functional communication, and feedback across all organisation layers, the firm will be able to keep track of the interactions between those resources embedded in a complex network, with tacit knowledge adding complexity and making it more difficult to determine which resources are central sources of competitive edge (Peteraf, 1993). This will result in unique highly mastered capabilities enabling the firm to achieve a SCA (Schroeder, Bates and Junttila, 2002).

4 DISCUSSION OF THE RESULTS

4.1 WHAT ARE THE CONSEQUENCES OF APPLYING RBV FOR THE FIRM-INTERNAL ROLE OF OPERATIONS STRATEGY?

Usually the Operations strategy is expected to take a more reactive stance regarding strategy making. The business strategy sets the general direction taken by the firm while functional level strategy has to align with these guidelines, if strategic success is to be achieved (Wheelwright, 1984). However, by applying the RBV, the Operations strategy is really pushed to play a proactive and even leading role in the firm strategy making. As the attention is shifted toward these resources and capabilities that yield the potential to make firms attain a sustainable competitive advantage, Operations strategy holds on the power to become the main strategic weapon of the firm (Gagnon, 1999).

Indeed, first and foremost, competitive advantages are built based on the unique resources and capabilities which have their origins in the operations area. In most cases, it is true that "the knowledge and implementation of processes and practices associated with the effective transformation of goods lies at the core of operations" (Coates and McDermott, 2002, p. 437). Therefore, it is important that the business strategy is aligned with the manufacturing mission and policies, and not the other way around anymore. The organisational structure and infrastructure should be designed to support manufacturing in acquiring, developing and leveraging bundles of resources and capabilities, and then deploying them to achieve its strategic tasks (Wheelwright, 1984; Barney and Arikan, 2001). Also, Teece and other authors implied that human and organisational factors play a major role in the creation of competitive advantages (quoted in Schroeder, Bates and Junttila, 2002). Hence, bottom-up action plans should play a more crucial role in strategy making, as lower-level workers are the closest element to the resources and capabilities used in achieving competitive distinctiveness. Thus, the firm's organisation should create an environment where this type of initiative is encouraged and valued, enabling the firm to fully enjoy the tacit knowledge hold by its workforce (Kim, Sting and Loch, 2014).

In conclusion, through the RBV lenses, the manufacturing function could become the leader regarding strategy making, making sure that the firm's resources and capabilities are correctly employed as competitive weapon and providing clear guidelines to develop, protect, and leverage those assets (Gagnon, 1999). By taking a more introverted orientation to manufacturing, the RBV emancipates its overlooked strategic importance and helps to understand resources and capabilities rooted in operations as something more than just strategising around product market positioning (Pandza, Horsburgh, Gorton and Polajnar, 2003). The Operations Strategy's literature, and more particularly the four-stage model of Hayes and Wheelwright (1984) share the same insights. Indeed, in their model, the most advanced stage includes the use of operational resources and capabilities leading to a manufacturing based competitive advantage while the lower stages display a market-driven focus (Schroeder, Bates and Junttila, 2002).

4.2 WOULD RBV YIELD A DIFFERENT FINAL STRATEGY OUTCOME THAN A HILL-SKINNER TYPE STRATEGY?

It's true that, to a certain extent, both theories promote the use of resources and capabilities to achieve competitive advantage (Hitt, Xu and Carnes, 2016). However, the path taken and the divergent central aspects on which each theory is focusing affect the strategy outcome in two different ways.

4.2.1 OPPORTUNITY FOR DIVERSIFICATION

Firstly, by turning its attention toward the development, protection and leveraging of unique and valuable bundles of resources and capabilities, the firm avoid locking itself into a logic of satisfying the requirements of a specific market. By applying the RBV, firm can concentrate on the building of core assets that may hold the potential to create competitive advantages in a range of markets. Therefore, the RBV eases the deployment of the firm's strengths by making it more flexible and dynamic regarding the industries it wants to operate in (Prahalad and Hamel, 1990). However, the different markets in which the company decides to invest its time and scarce resources still have to be linked in some kind of way. Indeed, the firm is limited

regarding the type of industries in which it can succeed. Due to trade-offs being made and since the assets hold by the firm are resulting from a coherent set of decisions to guide the firm toward the tasks that it can perform well, it cannot afford to accomplish everything with them (Wheelwright, 1984; Barney and Arikan, 2001).

The RBV enables the firm to look beyond the simple service of a specific market. Its resource orientation grants the firm with the opportunity to engage in a range of end products and markets, instead to only be committed to a precise product/market determined by a specific priority set (Coates and McDermott, 2002). Diversification is justified by the RBV as it enables the firm to benefit from additional value that can be extracted from its operational resources and capabilities, given that they are not designed to satisfy a singular market (Teece, 1980 and 1982, Montgomery and Wernerfelt,1988).

4.2.2 PROTECTION OF A COMPETITIVE ADVANTAGE POSITION FROM IMITATION BY COMPETITORS

Globally, the operations strategy's theory never really mentions competition when trying to explain how to achieve a competitive advantage. It does not consider the fact that when profits are made, it attracts other firms, forcing the manufacturing company to fiercely fight to maintain its competitive edge. Indeed, by analysing the adoption and implementation of specific operations practices and their effects on performance, manufacturing strategy fails to address the impact of competition imitating those successful operations practices and innovations (Schroeder, Bates and Junttila, 2002).

Therefore, the RBV has the appropriate theoretical structure to complement operations strategy, addressing the shortcomings in this field of research. Indeed, the RBV perspective brings a useful framework giving insights on how to protect its resources and capabilities from imitation and substitutability, which are primary prerequisites to gain sustainable competitive advantages. The RBV suggests that operational resources and capabilities can only contribute to competitive advantages when isolating mechanisms are in place in order to prevent competitors to duplicate or replace them (Schroeder, Bates and Junttila, 2002).

4.3 UNDER WHAT CIRCUMSTANCES WOULD RBV PROVIDE APPLICATION ADVANTAGES TO THE FIRM?

The application of the RBV has the potential to bring real advantages to the firm. Nevertheless, like any other theoretical framework it has limitations. Therefore, if the firm wants to fully benefit from the application of the RBV, certain conditions have to be met (Barney and Arikan, 2001; Barney, 2001; Priem and Butler,2001; Kraaijenbrink, Spender and Groen, 2009).

Firstly, according to Barney (quoted in Gagnon, 1999), the firm will need a highly proficient management team when applying the RBV. Indeed, the management team must be able to design and implement efficient enough policies and mechanisms that will allow the firm to keep control over its complex bundle of resources and capabilities. This is mandatory if the firm wants to keep track of its sources of competitive edge and continue to nurture and protect them. This is the only way that the management team will be able to maintain this competitive distinctiveness over the long run (Gagnon, 1999). Otherwise, isolating mechanisms like social complexity or causal ambiguity surrounding these bundles will not only prevent competitors from imitation but will also impede the management team's capacity to efficiently manage its resources and capabilities and take advantages of opportunities in the imperfectly competitive strategic factors market (Gagnon, 1999; Coates and McDermott, 2002).

Secondly, the RBV theory highlighted the fact that a firm could become more flexible and dynamic in the type of businesses it decides to invest its scarce resources in (Prahalad and Hamel, 1990). However, as Barney pointed out (quoted in Kraaijenbrink, Spender and Groen, 2009), the RBV application is particularly limited by the fact that it is only viable in markets where the rules of the game remain fairly fixed. Indeed, in unpredictable environments, in which new technologies and opportunities emerge frequently, the value of the resources and capabilities in which the firm has invested considerable time and money can drastically change. Therefore, even if the firm grow into a more dynamic and flexible entity through the application of the RBV, the markets in which it agrees to compete still have to yield some

stability in order for the firm to fully enjoy the potential of their bundles of resources and capabilities (Kraaijenbrink, Spender and Groen, 2009).

Finally, it may be really difficult for a firm to use the RBV to design and implement a strategy yielding the potential for attaining sustainable competitive advantages, when the firm does not already hold this potential for such advantages (Barney and Arikan, 2001). Any theory that pretends to give the opportunity for any firms to succeed in any type of situations is proposing a **rule for riches**[11]. However, it is well known that such theory cannot exist. Indeed, if simply applying a theory to a company without any particular predisposition for success results in the creation of competitive advantages for that firm, then the application of this theory to any other firm will also result in the creation of competitive advantages. Consequently, there would not exist any competitive advantage anymore as any firm could get one by simply following the theory. Fortunately, in the case of the RBV theory, the causal ambiguity, social complexity and all the shades surrounding the management of the bundles of resources and capabilities keep it from becoming a rule for riches. In the end, the initial resource-position of the firm plays a determining role in its success and should already yield the potential for sustainable competitive advantages (Barney and Arikan, 2001).

[11] "If the application of a theory to a firm without any special resources can be used to create competitive advantages for that firm, then it could be used to create competitive advantages for any firm, and the action undertaken by any one of these firms would not be a source of sustained competitive advantage. Even if a "rule for riches" created economic value, that value would be fully appropriated by those that invented and marketed this rule" (Barney and Arikan, 2001, p. 173).

5 CONCLUSION

5.1 BRIEF SUMMARY

The Operations Strategy and the Resource-based view embark on different paths to explain a sustainable competitive advantage. On the one hand, we have a perspective that's focusing on the satisfaction and strengthening of a market position, stipulating that manufacturing should align its mission and policies with the business strategy and support it (Skinner, 1969; Wheelwright, 1984). On the other hand, a perspective that's focusing on the acquisition/development, protection and leveraging of a firm's unique resources and capabilities to achieve competitive advantages in a small range of linked markets (Wernerfelt, 1984; Barney, 1991).

Therefore, the application of the RBV to Operations strategy will have clear repercussions on its different aspects, its role in the firm and the resulting strategy. First of all, as the attention is shifted toward the resource position of the firm, the manufacturing function will dedicate its mission, policies and main objectives to the nurturing and protection of the resources and capabilities representing its sources of competitive distinctiveness (Schroeder, Anderson and Cleveland, 1986; Barney and Arikan, 2001). The profitability and constant improvement of its resource position will be defined by the consistency of the pattern of decisions shaping the structure and infrastructure of the manufacturing organisation over time. Eventually, it will result in the building of synergistic and highly complex network of knowledge and assets which are critical to attain and especially maintain competitive advantages (Lippman and Rumelt, 1982; Peteraf, 1993).

Secondly, the RBV enables the manufacturing function to play a more leading role in strategy making. Indeed, by making the firm realising that the unique resources and capabilities lying in the operations area are the main sources of competitive advantages, the RBV postulates that business strategy should be designed in alignment with the manufacturing mission, policies and objectives. Thus, the business strategy should play a more reactive and supportive role by ensuring that the clear guidelines ensuring that the resources and capabilities are correctly employed as competitive weapons are well disseminated throughout the whole firm.

It should also assist manufacturing by emphasising the importance of the process of development, protection and leveraging of those assets (Hayes and Pisano, 1996; Gagnon, 1999).

Finally, the strategy resulting from the application of the RBV to Operations strategy yield two interesting outcomes. Firstly, by focusing on its resource-position, the firm is able to diversify its activities. Indeed, as manufacturing does not attempt to satisfy the requirements of a specific market, it opens itself up to more opportunities for diversification. However, due to trade-offs in resources and policies still limiting the performance of the firm along the different competitive dimensions, the markets in which it decides to compete in have to be linked in some kind of way (Skinner, 1974; Wheelwright, 1984; Prahalad and Hamel, 1990). Secondly, the RBV is a useful framework bringing clear insights on how to protect a firm's competitive distinctiveness. Inimitability and non-substitutability are major requirements to achieve sustainable competitive advantage. Therefore, the firm will need isolating mechanisms in the form of property rights, causal ambiguity or social complexity to preclude competition imitation (Schroeder, Bates and Junttila, 2002).

In conclusion, the RBV framework could become an amazing tool for Operations strategy, pushing it to the top of the strategy making hierarchy (Gagnon, 1999; Hayes and Pisano, 1996). Nevertheless, the firm will still need a highly proficient management team in charge to handle all the casual ambiguity and social complexity surrounding bundles of resources and capabilities (Lippman and Rumelt, 1982 Peteraf, 1993; Gagnon, 1999). Also, markets in which the firm is operating must display some stability if the manufacturing organisation does not want to see its resources and capabilities lose value from one day to the next (Kraaijenbrink, Spender and Groen, 2009). Lastly, to achieve sustainable competitive advantages, the firm must already demonstrate some potential for success. A firm starting from a poor resource position cannot pretend to be able to achieve strategic success just by applying the RBV. Otherwise, the RBV theory is proposing a rule for riches which cannot be possible (Barney and Arikan, 2001).

5.2 FUTURE RESEARCH

In the end, applying an RBV perspective to Operations strategy has proven to be quite difficult to operationalise, primarily because of causal ambiguity, social complexity and path dependency surrounding firm-specific resources and operational capabilities. These abstract concepts turn each company into a unique case of study, thus making it hard to draw general conclusions and understand how exactly resources and capabilities interact to achieve sustainable competitive advantages. Therefore, it could be more interesting to study how the firm takes advantage of these vague and unintentional isolating mechanisms emerging in most cases at the operational level (Lippman and Rumelt, 1982; Peteraf, 1993; Kim, Sting and Loch, 2014). Such study should analyse how the firm manage to keep track of its most critical resources and capabilities embedded in a complex network of assets and tacit knowledge in order to keep protecting and nurturing them over the long run.

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