

# Operations Strategy, Environmental Management and Sustainability – There is a New Competitive Priority of the Operations

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## Abstract

The aim this qualitative research was to verify if the environment factor could be a new competitive priority in the Operations Strategy (OS), together with Cost, Delivery, Flexibility and Quality. The relationship between Environmental Management (EM) and OS in market-leading and ISO-14001 certified industrial companies was analyzed: *Natura Cosmetics*, *Tilibra Stationery Products* and *Companies X and Y*. The data were obtained from bibliographic research, semi-structured interviews, systematic observations and documentary consultation. The approach was deep enough to get yours results. The need to deal strategically with the environmental issue is not incorporated in OS theory. The exemplary companies studied indicate a path to success with any Generic Competitive Strategy (CS). The environmental factor has a strategic potential for competitive differentiation, it allows reducing costs (water, energy, etc.) and attending the stakeholders. Differentiation with a focus on the environmental factor allows greater profit margin, a support for unfeasible environmental measures from the perspective of Low Cost. The environmental factor can compose the OS as a qualifying factor for attend so the legislation, the market, and the customers. Thus, the environmental factor can/must be considered a new competitive priority for Operations; however, it must be combined with Sustainability and the Innovation.

## Keywords

Operations Strategy, Environmental Management, Sustainability, *Natura*, *Tilibra*.

## 1. Introduction

There seems to be a consensus among researchers about the need to consider the treatment of environmental issues, within companies, as strategic. However, rare studies indicate the need to integrate this issue in the Operations Strategy (EO), which can occur considering it as a new competitive priority for Operations. (Jabbour et al. (2012).

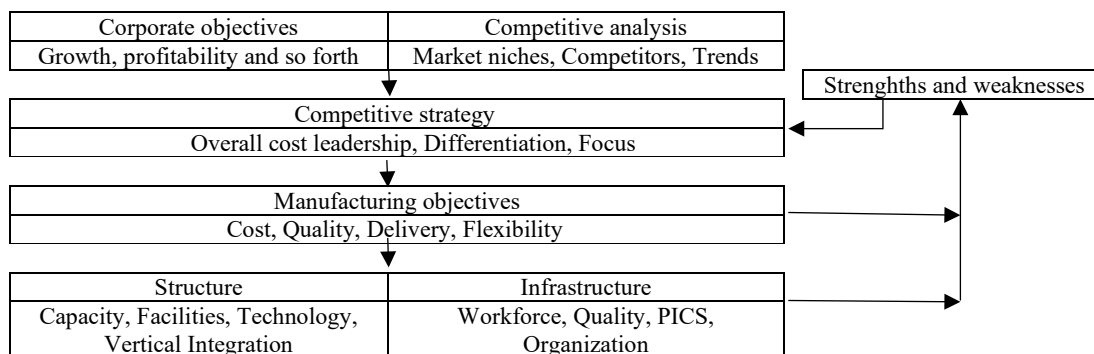
Thus, the question of this research is whether the environmental factor can be considered in EO as a new competitive priority and included along with the traditional ones - Cost, Delivery, Flexibility and Quality. The justification for this research question arose from the urgency in responding to the environmental question, coupled with its possible strategic potential for companies. This article portrays, then, the case studies carried out in the leading industrial companies in their markets and certified by ISO-14001 *Natura Cosmetics Public Company*, *Tilibra Stationery Products* and *Companies X and Y*, all with relevant participation in the environmental to different degree. It was worked a qualitative approach, considering that these companies can indicate an exemplary path for the competitive improvement of companies in general, and thus answering the research question.

It should be noted that Jabbour et al. (2012), through a quantitative approach, analyzed a sample of ISO-14001 certified Brazilian companies and concluded that Environmental Management (so they call it) could not be considered a competitive priority because, in most companies in their sample, it was not treated in a way strategic but preventive focus on eco efficiency. However, they conclude that it can positively influence the traditional competitive priorities of Operations and that there were companies, in a minority in their sample, that met the necessary conditions and their Environmental Management could then be considered a competitive priority for Operations. As a result, according to this quantitative approach, one has to wait until the environmental factor as a competitive priority occurs in most companies so that it can be considered in the theory of Operations Strategy. On the contrary, this present study adopts a qualitative approach, where the answer given by emblematic companies can be adopted, right now, so that companies in general can follow this path pointed towards competitive success.

## 2. Competitive and Operations Strategy

According to Hayes et al (2005), a company can achieve “a defensible competitive advantage in a number of ways, including some generic ones”: (1) *low cost / high volumes*, (2) *product innovation and unique features*, and (3) *customized service in select niches*. According to Porter (1991), three competitive strategies are possible to face the five competitive forces present in a given industry: *Cost Leadership and Differentiation Leadership* in large markets, and *Focus* in restricted markets. For Strategic Planning, in the Industrial Organization's view, Operations Strategy is a functional strategy that should underpin the Competitive Strategy. Thus, “each type of strategy demands certain production tasks and specifies certain objectives called competitive priorities” (Cerra et al., 2009, p.159). According to Albuquerque, Silva (2002), the consistency between the competitive and operations strategies is the determinant of the organization's competitive success.

According to Skinner (1969, p.138, 139), formulator of the Operations Strategy (OS) concept, Competitive Strategy (CS) brings “specific requirements for the production function” and operations, and conversely, it must be “specifically designed to fulfill the task required from strategic plans”, having cause and effect factors determining this link. Figure 1 shows the classical, widely adopted, model of OS structure according to Horte, Lindberg, Tunalv (1987, p. 1574), which makes it clear that it is a “summary of how different authors (Hayes e Wheelwright 1984, Fine e Hax 1985, Skinner 1978) treated manufacturing strategies concept”. As for the “Strategic Manufacturing Planning Process”, the model brings the OS derived from CS and being split into structural and infrastructural decision areas. The CS contemplates Porter's (1991) generic strategies, suffering influences from the macro environment, and being deployed in the traditional objectives (Cost, Quality, Delivery and Flexibility).



**Figure 1** – The Manufacturing Strategic Planning process.  
 Source: HORTE, LINDBERG, TUNALV (1987, p. 1574)

### 2.1 Competitive Priorities – Trade-Offs, Qualifying Factors and Order Winners

According to the model by Horte, Lindberg, Tunalv (1987, p. 1574) the "manufacturing objectives" are cost, quality, delivery and flexibility. Garvin (1993) states that most strategy authors cite these four objectives, which continues to occur: as for example, in Slack (2018) - textbook widely used in business schools and Operations disciplines - whose authors continue to cite these traditional goals, dividing only "delivery" into "reliability" and "speed".

According to Jiménez and Lorente (2001), competitive priorities of the Operations occur when they meet two basic requirements: they are obtained within the scope of manufacturing and can create a clear competitive advantage for

the company. From meeting these two requirements, working with environmental demands can be considered in OS as a new competitive priority

These objectives or competitive priorities of Operations can be classified into Qualifying Factors (QF) or Order Winners Factors (OWF). The first ones are those that, if they are below a certain level of performance, customers will not even consider the company's product compared to competitors. The OWF are those considered by customers to choose and buy the company's product (HILL, 1989).

## **2.2 Operations Strategy Decision Areas**

Skinner (1969, p.140), considering the notion of trade-offs in operations decisions, already pointed to the existence of areas in which “top management needs to recognize the alternatives and get involved in the design of the production system”, in order to select between more appropriate alternatives to the operations task “determined by corporate strategy”.

Decision areas can be structural or infrastructural. The following are definitions of those most widely accepted in the literature. According to Maia et al (2016, p.60, 61) structural decision areas have a long-term impact and require large investments, resulting in “determining organizational capacity”, being composed “according to what is most widely accepted in the literature” from: installation; capacity; technology and vertical integration. The infrastructural decision areas, with less difficulty, may be changed during the company's activities, according to Maia et al (2016, p. 61): Human Resources, Quality Management, Production Planning and Control, and Organization.

## **3. Competitive and Operations Strategy, Sustainability and Environmental Management**

The vast majority of scientists "recognize in human actions the source of the major problems that have negatively affected environmental and socioeconomic resources in different parts of the planet." The productive sector has long ignored "the negative effects of anthropogenic activities on the environment.", but this situation has changed radically. “Today, a company that risks breaking environmental laws risks receiving high fines and having a bad image with its customers” (ADISSI, ALMEIDA NETO, 2013, p.2).

The new environmental awareness “places the protection of the environment as one of the most fundamental principles of modern man” (CAMPOS; SELIG, 2002).

With regard to companies, production management "must include all its factors (materials, people, equipment, processes) ... functional aspects (productivity, quality)"; and there is also a need to manage "production process dysfunctions", the negative impacts “on working people (Occupational Health and Safety Management) and the environment (Environmental Management), as well as possible harm to consumers of their products (Customer Satisfaction Management). ” (ADISSI, 2013, p 3)

From the business point of view, Environmental Management can be considered a “global management function that addresses, determines and implements an environmental policy in the organization”, leading to the inclusion in the company's management of the externalities caused by its activities (TEIXEIRA; BESSA, 2009, p.5).

About sustainability, the concept adopted in this research is the created by Elkington (1994), the approach to expanding the traditional business model, when dealing with Environmental Management, i.e., of Triple Bottom Line, taking into account the company's environmental and social performance, as well as the economic and financial evaluation factors. This concept is also known as 3P (People, Planet and Profit). (OLIVEIRA ET AL., 2010).

Regarding Competitive Strategy, Operations Management, Environmental Management and Innovation, Porter and Van der Linde (1995, p.374) denounce a static mentality, by various social actors, behind the incorrect conduct of the debate on the relationship between competitiveness and environment. According to the authors, it focus on the costs of regulation and ignores the offsetting benefits of innovation - higher productivity. Competitiveness can be increased by reducing pollution, which means inefficient resource use and economic waste. In this sense, they point out that innovation can reduce or eliminate what was once considered fixed, and that companies that will recognize environmental improvement as a first, economic and competitive opportunity, rather than "annoying cost" or "inevitable threat", and adopt “innovation-based solutions” will reap great competitive benefits.

In other contribution, Porter and Kramer (2011) propose the *Creation of Shared Value (CSV)*, a new way of managing the company's competitive advantage, through the generation of economic value meeting socio- environmental needs as part of the core business, obtaining profit by addressing socio-environmental issues, seen not as cost, but as opportunity to generate economic value. It is about improving environmental performance making the company more profitable, managing its value chain creating competitive advantage, discovering potential opportunities born from the social and environmental issues surrounding its activities (PORTER; KRAMER, 2011)

The environmental theme came to be considered by companies and academia a short time ago and this was due to the negative impacts on the environment mainly arising from industrial operations, in order to characterize the so-called environmental issue with all its consequences. In this line, Lucato et al. (2012) state that companies are being obliged to consider the environmental requirement also in their strategies.

Barbieri (2011) points out that environmental concern entered the agendas of governments and segments of society only from the 1970s, and even more recently in business, from the moment that such concern began to arouse interest outside the restricted circles of experts and affected communities. According to Barbieri (2011), the environmental theme reached the streets, auditoriums, media etc. and the vocabulary of social agents. Despite the undisputed globalization of environmental issues, and companies having at the center of this process from the outset, the author states that there is no effective practice of change. For most companies, this concern has not yet become effective administrative and operational practices. For if this were already happening, the accumulation of environmental problems that endanger all living things would certainly not be so intensely seen. (BARBIERI, 2011, p. Viii)

On the other hand, in the first half of the 1990s, in the initial period of the treatment of the environmental issue in Brazil, Donaire (1996), in an article based on her 1992 thesis (year of UNCED-1992), puts the environmental factor as a strategic element for the company.

Dangayach and Deshmukh (2001, p.911) state that the emphasis on Total Quality Management, Business Process Reengineering (BPR), Green or Clean Manufacturing has led to a strategic shift in productivity issues towards green productivity or eco-efficiency. "It means operating manufacturing operations in a more innovative, responsive and ultimately sustainable competitive manner".

In a literature review, Jabbour et al. (2012, p.12) already pointed out in the early 2010s, that EM appeared "as an emerging and important competitive priority for manufacturing, given companies' growing responsibility for reducing environmental impacts related to their activities". However, the authors also pointed out that by researching in more than a dozen studies, they find that the "influence of the environment on competitive production priorities" was variable and specific characteristics of the industry, company, region or country where they meets could influence the results.

#### **4. Methodological Procedures**

As for the methodological approach, it was a qualitative research of the theoretical-practical, exploratory and explanatory type. The method used was the Case Study, applied to four industry-leading companies in their markets and ISO-14001 certified, three with Competitive Strategy (CS) of differentiation and one with CS of low cost, according to Porter (1991). As for data collection instruments, were used bibliographic research, semi-structured interviews with executives of the companies in the environmental and industrial areas, systematic observations in the companies' factories, and documentary consultation on their websites.

The model presented in Figure 1, by Horte, Lindberg, Tunalv (1987), guided the study, having been used to obtain field data. Thus, it was identified the company's CS, its competitive priorities and how they occur in its various structural and infrastructural decision-making areas, mainly regarding the issues of the environmental and sustainability. However, why was this model chosen? - Because until today it is consolidated, and being used among researchers, authors and professors of Operations Strategy.

The number of companies studied is appropriate to the type of research that is qualitative. It is not on the agenda to have a representative sample as occurs in quantitative studies. In this sense, the choice of companies occurred due to the leadership in their markets, particularly regarding their contribution to the concrete practice of Sustainability: *Natura*, today a multinational Corporation, is consistently cited as an example in dealing with this issue. *Natura* and

*Company X* are certified carbon neutral. *Company Y* brings new elements in the treatment of the theme, and *Tilibra* has the role as raw material, which has the stigma of being environmentally unsustainable.

#### 4.1 Propositions

P1 - The OS theory has remained the same in that it does not incorporate the treatment of the environmental issue;

P2- Significant advances are being made in the treatment of the environmental issue by certain companies, in which the environmental factor is considered in the OS as a new competitive priority, differentiation factor and winner of orders;

P3 - For these companies, addressing the environmental issue is part of their CS as a differentiating factor;

P4 - For companies adopting the Differentiation Strategy (Porter, 1991), which focuses on addressing the environmental issue, the differential profit margin that it obtains through the permissible practice of a premium price at the OS level serves as the backing to adopt measures environment that would not be viable in a Low Cost perspective;

P5 - On the other hand, there are companies that deal with the environmental issue mainly motivated by the compliance with the legislation, and due to qualification requirements with their clients, markets or their headquarters. Even in this case, the environmental factor can compose its OS as a qualifying factor;

P6 - For companies that adopt the Least Cost CS (Porter, 1991), the environmental factor can compose Operations competitive priorities as a qualifying element with customers or the market, and Environmental Management can contribute to cost reduction.

### 5. Competitive Strategies of the Companies Studied

Following is a presentation of the companies studied and yours Competitive Strategies, chosen due to the industrial sector, ISO-14001 certification and leadership in the markets in which they operate. The four companies analyzed belong to industrial sectors that offer great pressure for a proactive environmental stance, to a greater degree for *Natura* and *Company Y*. For the first, derived from its strategy of using Pan-Amazonian extracts. *Company X* and *Tilibra* have the same main customers, which influence the adoption of environmental certifications, being the main ISO-14000 and Forest Stewardship Council (FSC). *Natura* does not suffer corporate influence; the other three have a strong influence: *Tilibra* and *Company X* in the sense of reducing costs and increasing productivity, and in *Company Y*, in addition, to obtain economic-financial-environmental gains in the plants of the client companies.

#### 5.1 *Natura Cosmetics Public Company*

*Natura Cosmetics* (Public Company) – Its operations involve three product categories - Perfumery, Makeup and Body - produced in three industrial plants in Cajamar-SP. This company is considered exemplary in the adoption of sustainability as strategic, and may contribute to advance the theory of OS.

*Natura* has the Competitive Strategy (CS) "Differentiation in Market Broad" (Porter, 1991) and "Product Innovation, and Unique Features" (Hayes et al., 2005). This CS has the Quality, Innovation and Sustainability (TBL) guidelines as differentiating elements directing its goals and indicators deployed to all areas in a top-down model. *Natura* declares itself "a company committed to generating a positive environmental and socioeconomic impact on all businesses, brands and geographies in which it operates". It was "the first publicly traded company to receive *Company B certification* in the world in 2014, renewed in 2017. The *System B* movement characterizes companies that give equal weight to their economic and social and environmental results" (*Natura*, 2017, p.8). . It is ranked among the "Top 20 Most Sustainable Companies in the World" in the *Corporate Knights Global 100 Ranking* (*Natura*, 2016). For the fifth time, in 2017, it received *the world's most ethical company award* from the *Etisphere Institute* (*Natura*, 2017). A carbon neutral company since 2007, it has set goals for becoming a "positive impact generating company" in its *2050 Sustainability Vision* with periodic cycles (*Natura*, 2017). It was the first in Latin America (and the only one in the world in the cosmetics sector), according to *Natura* (2016, p. 64), to publish in July 2016 its full *EP&L - Environmental Gains and Losses* - translation of the environmental impact into financial values.

As for the Competitive Strategy, *Natura* has a very large product line, a limited possibility to work with low cost / high volume. However, there is a lot of work on innovation, development and launch of new products. It works with the model of direct sales through consultants, recently expanded for sale by relationship in one multichannel model, starting to be present in physical stores, direct and franchised, in drugstore chains and mainly on the Internet, seeking to expand its relationship and valuation of the selling consultants, seeking to strengthen their CS.

### **5.2 Company Y**

*Company Y* - Unauthorized identification - This is a specialty chemicals manufacturer, headquartered in the United States, with several units located in several countries, and its focus is in Brazil located in a city in the interior of one of its states. Its products are focused on process improvement in determined types of industries, including: Leather, Water Treatment, Paper and Chemical Performance, Sugar and Ethanol, Petrochemical and Inks.

*Company Y's* Competitive Strategy has Focus on Differentiation (Porter, 1991), practicing customized service leadership in select niches (Hayes et al., 2005) through expanded products and *ROE (Return on Environment)* and *ROI (Return on Investment)*. Its differential is the prevention and resolution of complex problems in customers' plants, placing itself as a reference for an environmentally friendly chemical company, with one "Green Project" to help customers see opportunities for environmental improvement; that is, a service associated with the product, called an extended product. Your service may be restricted to consulting. The restrict product is not the differentiator, but the knowledge of the expanded Operations personnel to apply it, control the process and provide consultancy at the customer plant.

### **5.3 Tilibra Stationery Products Limited Company**

*Tilibra Stationery Products, Limited Company* - The activities of the industrial plant in Bauru-SP for the manufacture of paper products were studied, the main one being the copybook. However, its activity also includes wholesale trade in the full range of other school and office products, the production of which is outsourced.

*Tilibra* (like *Natura*) has a Competitive Strategy "Differentiation in the wide market" (Porter, 1991) and "unique product innovation and characteristics" (Hayes et al., 2005). The main product is the hardcover spiral copybook with featuring art and image of licensed characters and fashionable highlight color, plus plastic bag, sticker sheet etc.; it also enjoys quality image in the market. This configuration is part of the differentiation that the company achieves with its customers, also achieved with focus on Delivery, Quality and expanded mix. As for *Product Leadership* characteristics, it seeks to achieve customization in a product that has commodity characteristics. On the other hand, the characteristics of the product (copybook) allow standardizing the assembly work to some extent, depending on the level of product customization, in order to obtain larger volume with less variety, lower cost and higher productivity. However, in general, frequent set-ups on equipment are necessary to contemplate the variety of different items that make up this main product of the company (type of lines and of the customization, number of divisions / disciplines, plastic bag, adhesive sheets and different artwork on the covers, with licensed characters, etc.).

### **5.4 Company X**

*Company X* - Unauthorized identification - This is a multinational, the largest manufacturer of its main product in the world, founded a long time ago. The focus was on its main factory located in the interior of a Brazilian state, with 1,700 employees, where it produces the company's flagship product in Brazil in two versions. In this unit, a corporate management of sustainability and quality is exercised in relation to the other units of the company in Brazil.

*Company X's* CS is "Differentiation in broad market" (Porter, 1991), as it has a tradition of quality and market leadership with its well-known flagship product, in both versions, leading to premium pricing. From Hayes et al. (2005), their CS can be placed as "product innovation and unique characteristics". However, *Company X* is transitioning to low-cost CS (Porter, 1991) or low-cost / high-volume CS (Hayes et al., 2005) as a way to face increasing competition. Porter (1991) warns of the difficulty of oscillating CS. However, the mentioned transition will bring coherence between *Company X's* CS and OS, as it will focus both on Cost, which already occurs and will continue to occur on your OS.

## **6. Operations Strategy and New Competitive Priority: Environmental Factor**

According to *Natura's* Industrial Board, its *Beliefs, Essence* and *Vision* "need to be materialized", being the "Reason for Being" of its Operations, translating "Sustainability as a Strategy", *Natura's Essence* into Competitive Advantage

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According to *Natura* (2017), its Manufacturing Management is based on the *Total Productive Maintenance (TPM)* system, with emphasis on (1) Cost and Productivity, (2) Quality, (3) Delivery, (4) Safety, Health and Environment. Additionally, this research found that for its Operations in general, the competitive priorities are: (1) Delivery and Quality; (2) Cost; (3) Environmental factor; (4) Innovation; (5) Flexibility. It should be noted that the environmental dimension is treated as a competitive priority for Operations as part of Sustainability in the *TBL* concept. In its OS, a highlight is that the company has been considered carbon neutral since 2007, which was achieved by reducing emissions, complemented by the purchase of carbon credits from social and environmental projects.

For *Natura*, the environmental factor has a high impact and is treated as a Competitive Priority for Operations, according to Jiménez and Lorente (2001): the Environmental Management influences the operational performance it and has been able to create a clear competitive advantage for the company. The environmental factor, as it is treated at *Natura*, influences all the structural and infrastructural decision areas, and creates a real competitive advantage for the company, being explicit the sustainability guideline from its Business Model, through its CS and deriving to its OS, with goals and indicators for all of its Operations, including Supply Chain, Logistics and Manufacturing.

*Tilibra* also has *TPM*-based Manufacturing Management, emphasizing Production, Productivity and Quality, and internal and external audit programs. Its competitive Operations priorities are: (1) Cost (to increase profit margin, emphasizing increased productivity and efficiency); (2) Delivery; (3) Quality; (4) Flexibility; (5) Environmental Factor; (6) Service (customer troubleshooting). The environmental factor has low impact on Operations and is worked as Sustainability-TBL. However, the potential of this dimension is not yet fully realized, what would happen if it will work as a competitive priority of Operations. Its focus is qualifier with customers and stakeholders. The environmental factor has low impact on Operations. Although it is generated from manufacturing, it is not used for competitive advantage, being directed to comply with legislation and assisting the priority of reducing costs and increasing productivity, especially saving water, energy, cleaning cloths, recycling etc. For *Tilibra*, Environmental Management helps to reduce costs and improve image. A highlight is the FSC certification of its main raw material (paper).

*Company X* has been practicing a low-cost / high-volume Strategy and Operations Management, driven by the low variety of a significant portion of its processes, focused on a single flagship product. Recently, *Company X* is feeling its market share decline for competing products, which are approaching the level of quality it offers. This OS and Operations Management, combined with CS Differentiation has allowed *Company X* to increase profit margins. Currently, its CS tends to spell out the pursuit of Low Cost by lowering price and profit margin to face increasing competition. Thus, historically, based on Porter (1991), *Company X* has practiced an opposition between its CS (Differentiation) and its OS (Cost and Productivity).

*Company X* Manufacturing Management is based on Enterprise Resource Planning (ERP) modules and use of Excel spreadsheets. Its competitive Operations priorities are: (1) Cost (to increase profit margin), (2) Quality, (3) Delivery, (4) Environmental factor and (5) Flexibility. The Environmental is a Qualifying Factor (QF) with its customers, due to its medium impact to Operations, and its Environmental Management (EM) is associated with Sustainability (*TBL*), being generated from manufacturing. Despite being a qualifying factor (CF), the environmental has the potential to generate a competitive differential. Note that *Company X* is carbon neutral certified; its Operations have carbon sequestration surpluses derived from its environmentally sustainable forest operations.

*Company Y* Manufacturing Management is based on process control software, having completed in 2017 the implementation of a corporate ERP. Your competitive priorities considering your expanded product or service are: (1) Service including Environmental factor and Innovation, (2) Quality, (3) Cost, (4) Delivery and (5) Flexibility. These Competitive Priorities relate to Extended Operations. In manufacturing, the competitive priorities are: (1) Delivery; (2) Quality; (3) Cost (to increase profit margin); (4) environmental factor; (5) Flexibility. As the Environmental is a high impact factor for Operations (internal and expanded), its treatment is generated from manufacturing and used to

obtain competitive differential, with greater emphasis on economic and environmental, as environmental measures aim to reduce cost and increase productivity, with less emphasis on the social aspect.

Garvin (1993) mentioned the fifth competitive priority “Service”, which appears as the first in *Company Y*, however, considering the expanded product and operation, including operations and services performed at client company plants. The goal is to reduce costs, increase productivity and achieve economic and financial gains, but through environmental improvements derived, for example, from saving water, energy, inputs, speeding up reactions, etc. Note the quantification of these gains through the Return of Environmental (ROE) indicator, which is disclosed to clients together with the Return of Investment (ROI). Thus, it can be considered that, for *Company Y*, the Environmental factor is worked as a competitive priority of Operations.

Given the above, as noted, the environmental factor - term referred to at OS level, the environmental issue posed by CS - can, in all cases studied, be treated as a competitive priority. The difference is that this new competitive priority can be order winning, important in that the environmental factor is highlighted in CS and a higher status within the organization structure, as occurs in *Natura*. In other companies, such as *Tilibra* and *Company X*, the environmental is a qualifying factor, and the Environmental Management (EM) is important, but not to differentiate the product from the company. In addition, if these companies do not take care of the environmental factor through all the OS decision areas, they will not be able to produce and deliver their products accordingly, as they need to meet environmental and social legislation and expectations, in addition to customers, their headquarters and/or other stakeholders.

Thus, addressing environmental issues in CS, with the consequent placing of the environmental factor as a competitive priority in OS, leads to its being considered in general in all structural and infrastructural decision areas. As for EM, considering its management function, it makes it belong to the infrastructure, having a specific scope. However, there are structural issues that must be decided with the participation of this area, such as types of equipment, technology, processes etc.

## 7. Competitive and Operations Strategies in the Top Down Model

Regarding the deployment of Sustainability CS in the OS, particularly in its Decision Areas, the experiences of the companies studied point to the basic theoretical model that guides this research. In this model, particularly in *Natura's* experience, this process occurs exactly as regards the strategic configuration of the areas, so called structural and infrastructural decision areas, not involving day-to-day decisions.

The choice of sustainability has already made when it installed the reactors, the equipment, when it installed the production process. Therefore, this choice ends up not happening in everyday life. These great choices then support a well-grounded floor that only has to work with delivery, deadline organization and so on. (Verbal information from *Natura* Industrial Director, 2018).

This result is consistent with Corrêa and Corrêa (2012, p.39) who place Operations Strategy at the senior management's decision-making level because it deals with more aggregate and longer-lasting decisions. In addition, Operations Management deals with decisions and “issues more concrete of the day-to-day” within a time horizon of up to one year, with more specific and “detailed resource and process decisions” at a lower hierarchical level.

*Natura's* experience also informs that the deployment of the Competitive Strategy of Sustainability in Operations Strategy and decision areas can be done effectively through a top-down cascading flow structure from the company's Strategic Planning, composed of long-term (five-year) guidelines, goals and priorities and shorter-term guidelines - CO<sub>2</sub> reduction and water consumption, for example, is a goal for all areas. In this context, all areas have goals and it work in multidisciplinary and multi-area groups in the listed projects. This process remains in place by setting clear goals to meet by all areas, and the executives receiving returns from the company, including financial bonuses through as a reward for the positive results in the treatment of the environment, in addition to the bonuses received by the economic and financial results (EBTDA).

## 8. The Environmental Factor as a New Competitive Priority for Operations

Regarding the “business gain” represented by customers who choose to buy the product because the company has environmental certification and the competitor does not, in the case of ISO-14000 this is a qualifying factor and not a differentiation, since the common it is the leading companies in their markets to have this certification. *Tilibra*, *Company X* and *Company Y* have first-layer customers other companies and not the final consumer, and have ISO-



14001 because their customers demand it and their competitors have this certification. For *Natura*, the only one of the four that directly serves the end customer, this position in the supply chain, coupled with the type of industry it participates in and the choice it has made to use Pan-Amazonian socio-biodiversity inputs, contributes to treat the environmental factor and your management as competitive priority.

*Company X* is currently seeking recognition in the environmental and sustainability dimension. In this sense, it has an important component represented by the amount of carbon sequestration performed in obtaining its main forest-based raw material, which exceeds its emissions, causing the availability of carbon credits. This has enabled it to be declare carbon neutral and this is a central component of its environmental and sustainability business communication.

It was found that companies *Y* and *Tilibra* have in common that the costs involved in the implementation of Environmental Management (EM) had a high impact at first, but later; with a process of Continuous Improvement (CI) this impact was decreases. At *Natura*, this also happens, and the reduction of impact is achieved with the innovation processes. These statements are consistent with the Porter, Van der Linde (1999) hypothesis.

Regarding the cost-benefit balance of Environmental Management (EM), important advances and contributions occur with the quantification of environmental impacts - Environmental Accounting - performed by *Natura* through *EP&L* and *Company Y* through ROE - used in addition to ROI - but directed to EM's Expanded Operations. Having an EM in order to earn money and save is not explicitly included in any formalized policy. It is usually stated that the company's sustainability policies are based on the *TBL*. This concern is perceived by the companies studied, allied to the need to comply with environmental legislation.

Having an environmental management in order to earn money and save is not explicitly included in any formalized policy. With the environmental factor at OS, in the competitive priorities of Operations, the company strategically understands that environmental issues must be raised in advance and will be addressed in the decision areas. Thus, it is part of the structural issues to decide the location, facilities, technology, etc., which are interlinked with the environmental issue and affect the performance of EM. Nevertheless, it makes sense to place EM as an infrastructure element, as it aims to address the specific operationalization of various environmental requirements, such as those linked to legislation. On the other hand, environmental treatment will also be addressed in other infrastructural, and structural, decision-making areas, such as in the decisions of technologies to be used in processes. Thus, proactivity in the treatment of environmental issues in the Operations Strategy will be contemplated and guaranteed.

The economic sustainability that makes up the *TBL* in the CS contemplates more than the Cost aspect, as it involves, for example, return on investment, levels of commercial performance, general and product-specific market share. The social component also includes, in addition to internal aspects, external aspects, stakeholders and the community concerned. Addressing environmental issues in the OS may include not only aspects of internal operations related to the production process, but also external aspects of the supply chain, such as the sustainable extraction of raw materials, the use of clean technologies in pre-arrival processing in the company, including packaging. An example is FSC certification that covers internal and external aspects.

The environmental factor can be worked on in the OS to support both the differentiation and low-cost CS (Porter, 1991), because competitive differentiation allows premium prices, with the highest profit margin allowing the company to work with trade-offs between the environmental and the cost. On the other hand, environmental treatment also reduces costs, mainly with inputs such as water and energy, being associated with innovation. This promotes environmental gains, reduces negative impacts of operations, increases productivity and reduces costs. In this sense, the environmental factor and environmental management (EM), as strategic elements, can be considered in the OS, respectively as competitive priority of the Operations and one decision area. This are related to the new Competitive Strategy by Porter and Kramer (2011), *Creation of Shared Value (CSV)*: to obtain profit by addressing socio-environmental issues, which are not seen as a cost, but as an opportunity to generate economic of value.

The competitive advantage if the company is a pioneer in raising and working the environmental banner is evident, as it is a clear factor of differentiation in the market. On the other hand, this pioneering spirit leads to a greater impact on the Competitive Strategy and the Operations Strategy that needs to be managed. In a second moment, if the competitors also take this flag, which would be healthy for everyone, the environmental factor could become qualifying, however, continuing to compose the company's Operations Strategy. Its association with innovation, transforming

environmental challenges into business opportunities worked in new ways, generating value for the customer, can maintain the potential of treating the environmental factor generating competitive differentiation.

## 9. Results Regarding Initial Propositions

P1 - True - Although numerous authors have stressed the need to address the environmental issue strategically and include it as the Competitive Priority of Operations, this has not occurred at the theoretical level. The reason is that, from the standpoint of a quantitative approach, it would be necessary for a majority of companies adopting the environmental factor as strategic in CS and OS to be able to include them in the classic model as a new competitive priority of Operations (see topic 4.1). However, from the qualitative point of view adopted in this research, the experience of flagship companies may indicate an exemplary path that can or should be followed, as was the case with *Lean Production* studies in the past.

P2 - True. *Natura* places Sustainability (*TBL*) in its CS and its business model, as well as in its OS. *Company Y* also places in its CS the *TBL*, and OS the environmental factor composing the competitive priority 'Service' - provided in its expanded operations in the plants of the client companies.

P3 - True. At *Natura* Sustainability is one of the core elements of your CS. In addition, *Company Y* places as its core element in its CS "Differentiation in Wide Market"(Porter, 1991) or 'Select Niches Custom Service' (Hayes et al., 2005), its Expanded Operations service, which emphasizes the returns of the Environmental Management.

P4 - True. *Nature*, with the singular example of using organic alcohol to generate steam in the boiler instead of fossil fuel, aiming to achieve its goal of reducing carbon emissions. Also *Company Y*, with the premium price of its extended products practiced exactly by the benefits measured in ROE in addition to ROI.

P5 - True. At *Tilibra*, whose CS is Broad Market Differentiation (Porter, 1991), its EM is designed with the primary purpose of qualifying to meet legal requirements, also of its customers and its parent. The focus is on reducing costs through continuous improvement projects and reducing consumption of inputs such as cleaning cloths, water and energy, as well as being energy saving certified (ISO-50000), in a clear application of the hypothesis of Porter and Van der Linde (1995). However, *Tilibra* did not include the environmental issue in its CS and is not mentioned in its Values, including at the corporate level. As for *Company X*, that statement is also valid, as its main clients in Brazil are the same as *Tilibra*. However, *Company X* places the environmental issue, treated as Sustainability, in higher status within the company, both in the hierarchy and in strategic components such as its Mission, Vision and Values. That is, even for the two companies that have EM driven by qualification factors, not order winner, the environmental factor treated as Sustainability (*TBL*) has the potential to be worked from the Strategic point of view. This is being done at *Company X* and *Tilibra* could include this treatment of the environmental factor (as Sustainability-*TBL*) explicitly in its Mission, Vision and Values statements.

P6 - True. The four companies studied have one Competitive Strategy of Differentiation, three in a large market and *Company Y* in a restricted market. However, *Company X* is transitioning to a Competitive Strategy of low-cost to face growing competition. The premium price it practices has sought to increase the profit margin, as its Operations Management aims to reduce costs and increase productivity on all fronts; and this is now being intensified. In other words, *Company X's* response to the competition is, instead of seeking to maintain and leverage its position and market results, resulting from a Competitive Differentiation Strategy, it is opting to change this Competitive Strategy to another of low cost, but becoming consistent with its Operations Strategy, which prioritizes cost reduction. In this context, its *EM* meets the legal and qualification requirements with the same customers as *Tilibra*. More recently, this *EM* started to be treated as Sustainability, having reached the board level along with Human Resources, due to its potential contribution to positioning and legitimacy with its consumer market (national and international). Thus, regardless of whether the Competitive Strategy is of Differentiation or Less Cost, the environmental factor treated as Sustainability (*TBL*) has strategic potential for the company. In addition, can contribute to cost reduction, as well as providing compliance with legislation, justifying its inclusion as a competitive priority for Operations.

## 10. Final Considerations

The overall objective of this research was to see if the environmental factor could be considered in Operation Strategy as a new Competitive Priority of Operations, along with the traditional Cost, Delivery, Flexibility and Quality priorities, by analyzing how Environmental Management and Operations Strategy relate in industrial and market-

leading companies in ISO-14001 certified. The framework that directed the research was the classic Operations Strategy model of Horte, Lindberg and Tunalv (1987).

That objectives were met. The addressing environmental issues at the CS level, happens with the environmental factor understood as Sustainability (*TBL*). The unfolding of this Sustainability in the OS is due to the insertion in it of a new competitive priority of Operations: environmental factor. This result is in line with the various authors who put this need for companies actually place this factor at in the strategic level. Thus, significant advances are being made in the treatment of environmental demands, while Sustainability (*TBL*), by the companies *Natura Cosmetics* and *Company Y*. In these companies, the environmental factor is considered as a competitive priority, differentiation factor and winner of orders. In *Company Y*, the environment is placed composing the competitive priority Service, together with Innovation, involving its product and operations expanded in the plants of the client companies. Thus, there is a meeting of environmental demands being part of Sustainability (*TBL*), being present in the company's CS, composing the differentiation in broad market (Porter, 1991) or the customized service in select niches (Hayes et al., 2005).

On the other hand, even working the environmental demands to meet the legislation, or to qualify towards to customers, markets or to meet guidelines of its headquarters, as it happens in the *Tilibra* and *Company X*, can still the environmental be placed in the Operations Strategy as one qualifying factor. In this case, the emphasis seems to be on the potential cost reduction present in the treatment of the environmental factor, through continuous improvement projects, reduction of input consumption, mainly water and energy, and the practice of the Porter and Van der Linde Hypothesis (1995), i.e., being it associated with Innovation. Even in these cases, environmental demands can also be placed at Competitive Strategy, be mentioned in the company's Mission, Vision and Values, and its Business Model. It should be noted that the status level in the hierarchy of the sector responsible for Environmental Management denotes the magnitude of the relationship between environmental impact and degree of importance given to the theme by the company. Thus, even though the environmental is treated as a qualifying factor, environmental demands can be considered at the company's strategic management level, and therefore also at its Operations Strategy.

For companies adopting the Competitive Strategy lowest cost (Porter, 1991) or low cost / high volume (Hayes et al., 2005) CS, the environmental factor can also make up the competitive priorities of Operations, being a qualifying element with customers and contribution to cost reduction. In this case, with the managing of the operations focused on reduce costs and increase productivity on all fronts, the environmental factor and its management meet only the legal and qualifying requirements of customers. However, it can compose the Strategies, Competitive and of Operations, achieving higher or lower status in the organization chart, but with the potential to contribute to the positioning, legitimacy and qualification of the company in its market. Thus, regardless of Competitive Strategy by Porter (1991) or Hayes et al. (2005), the environmental factor associated with Sustainability (*TBL*) and the Innovation has strategic potential for the company, justifying its inclusion in the Operations Strategy as a new competitive priority. However, it may have a (limited) cost reduction objective, combined with compliance with environmental and social legislation, and qualification next to the market and customers. Alternatively, it may have a higher goal of helping to leverage the company and differentiate it from competitors.

Environmental demands must be present in companies' Competitive Strategy and Operations Strategy; and the environmental factor must be considered a new Competitive Priority of Operations, just as Environmental Management is one of Operations Strategy's decision areas. The main scientific argument that underlies the conclusions of this research is its qualitative character: it is not a matter of extrapolating the results from a probabilistic sample, but of verifying but of verifying advanced strategies and trends that companies can follow in order to obtain competitive advantage. In this way, they can be motivated to work the environmental factor at a strategic level, minimally by its qualifying character with the clients. The environmental factor and your management deserve strategic emphasis, to reduce harmful consequences of the environmental issue, and because of their potential to contribute to the maintenance, survival and growth of the company. As for competitive differentiation, when many companies are working at the strategic level, this factor may no longer be a differentiating. However, it will have continuity as a qualifying factor. Its association with innovation, transforming environmental challenges into business opportunities that are worked on in new ways, generating value for the customer, can maintain the potential of environmental treatment generating competitive differentiation.

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