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ALIGNMENT BETWEEN THE SUPPLY, MANUFACTURING AND DISTRIBUTION STRATEGIES AND THE BUSINESS STRATEGY

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ABSTRACT: The study aims to identify the degree of alignment between the supply, manufacturing and distribution practices on the one hand and the generic business strategies suggested by Porter (1996): differentiation, low cost, focus on differentiation and focus on low cost on the other and to obtain some insights into how these relationships influence business performance. The *gestalt* and profile deviation (Venkatraman, 1989) approaches were used to identify the relationship between practices and the degrees of alignment in the respective strategy groups. When compared to other strategy groups, the group of companies predominantly devoted to the Focus on Low Cost strategy (49,25%) was found to have: greater consistency in the development of practices between supply, manufacturing and distribution, a high degree of alignment of most of these practices with that strategy, a greater tendency towards achieving better business performance.

Keywords: alignment, manufacturing strategy, supply strategy, distribution strategy

INTRODUCTION

The value of studies such as the present is increasingly apparent, since industrial companies are constantly introducing new knowledge and new technologies, of both a technical and managerial nature, which often causes internal misalignment between operations (Smaczny, 2001; Wheelwright, 1984). Misalignment is the result of low synergy between the processes, usually due to the difficulty that leaders encounter in clearly communicating the company's strategy to other levels within the company (Hax & Wilde II, 2001; Luftman, 2000; Papke-Shields & Malhotra, 2001). The likely effect of this is the development of practices that are disconnected from each other, reproducing flaws and imperfections throughout the production process, which can compromise the achievement of objectives and business goals and consequently performance. Strategic alignment in this context means that the decisions taken within the dimension of each sub-strategy should be mutually consistent and converge with the overall business strategy (Joshi, Kathruia & Porth, 2003; Sun & Hong, 2002).

The aim of this paper is to examine to what extent the supply, manufacturing and distribution practices are being developed in a manner coherent with each other and consistent with business strategy, and also attempt to evaluate the extent to which alignment and performance are related in the study sample.

The Business Strategy and the Supply, Manufacturing and Distribution Strategies

According to Porter (1989), the main competitive advantages that a company can have are low prices or differentiation. Combining them with the com-

pany's scope of operations, gives rise to four generic strategies - cost leadership, differentiation, focus on low cost and focus on differentiation - which allow the company to achieve above average performance in their respective segment or industrial sector. The hybrid strategy is a real option in companies, mainly in those within industrial supply chains and engaged in world-class manufacturing, which besides being competitive in terms of price also need to be competitive in terms of quality, flexibility, speed and reliability (Harrison, 1998; Hill, 1988). Decisions taken at the level of production and operations strategy in the scope of industrial firms – supply, manufacturing and distribution, are expected to converge with decisions concerning the generic business strategies (Skinner, 1969; 1974; Wheelwright, 1984).

The Manufacturing Strategy

The manufacturing strategy reflects how a company intends to compete in the market by making internal choices consistent with their competitive priorities of cost, quality, flexibility, reliability and speed of delivery to achieve global success (Hayes & Wheelwright, 1984; Hill, 1985; Skinner, 1969; Spring & Boaden, 1997). By setting the priority in a competitive dimension, for example, low cost, production goals and action plans should reflect this particular direction (Kim & Arnold, 1996; Neely, 1993; Richardson, Taylor & Gordon, 1985; Schroeder, Scudder & Elm, 1989). In the present study, these four structural aspects of decision-making (Hayes & Wheelwright, 1983) are considered attributes and correspond to the variables related to the manufacturing strategy (Chart 1): **Constant Capacity, Specialist Facilities, Flexible High Technology** and **Vertically Integrated Production**.

Chart 1: Theoretical and Conceptual References for the Production Strategy Attributes

Manufacturing Strategy Attributes	Theoretical and Conceptual Approach	Authors
Constant Capacity	Capacity is a key determinant in response time to customers. The increase in capacity utilization is directly related to the higher rate of return on capital.	Rajagopalan and Yu (2001); Wheelwright (1984)
Specialist Facilities	Represents a competitive weapon because its structure is dedicated to perform a particular production task, arising from the business strategy and marketing objectives, whose goal is to serve a niche or particular market segment.	Griffiths and Margetts (2000); Ketokivi and Jokinen (2006); Skinner (1974); Van Donk and Van Der Vaart (2007); Wheelwright (1984)
Flexible High Technology	The result of combining high technology with process flexibility is to achieve technical accuracy and the ability to execute different product designs.	Morita and Flynn (1997); O'Regan and Ghobadian (2005); Ward, McCreery and Anand (2007)
Vertically Integrated Production	Rests on the theories of RBV (Resource Based View) and TCE (Transaction Costs Economics) whose main reasons for its maintenance are: achieving higher profits, reduced costs, reduced risk of dependence on other firms and absence of a qualified supplier.	Ellison (2005); Fine (2000); Hoffmann and Schaper-Rinkel (2001)

The Supply Strategy

The supply strategy involves a set of definitions that depend on the primary decision "make or buy" (De Toni, Nassimbeni & Tonchia, 1994). Supply-related decisions are still eminently operational in a large number of companies. With the emergence of the supply chain management approach, there was a change of focus in relation to supply activities, which became a strategic area of business performance (Lee, Kwon & Severance, 2007; Tan, Kannan & Handfield, 1998; Vaart & Van Donk, 2006). For the present study, four supply strategy attributes are listed, two related to the interaction with suppliers dimension, **Strategic Relationship with Suppliers** and **Strategic Supplier Selection**, and two related to the procurement dimension, **Alternative Supply** and **Traditional Procurement Process** (Chart 2).

Chart 2: Theoretical and Conceptual References for the Supply Strategy Attributes

Supply Strategy Attributes	Conceptual and Theoretical Approach	Authors
Strategic Relationship with Suppliers	Partnerships, strategic alliances, joint ventures are explicit manifestations of resource sharing, technology, projects, research, cost savings between supplier - customer.	Chen, Paulraj and Lado (2004); Field and Meile (2008); Fynes and Voss (2002); Kouvelis, Chambers and Wang (2006); Paulraj, Chen and Flynn (2006)
Strategic Supplier Selection	Company focused on differentiation, in addition to technical criteria, trend to value quality and issues related to reputation, financial stability, honesty, culture, and confidentiality of key suppliers.	Fierro and Redondo (2008); Hsu, Kannan, Leong and Tan (2006); Juha and Pentti, (2008); Prajogo (2007)
Alternative Supply	By having more than one supplier the company aims to maximize return on investment by reducing acquisition costs and ensuring its needs are met.	Janda and Seshadri (2001); Swift (1995)
Traditional Procurement Process	This process is usually used with non-strategic suppliers, in policies involving large inventories, with long life cycle products and procurement-based businesses.	Cousins (2005); Gulbrandsen, Sandvik and Haugland (2009); Pressey, Winklhofer and Tzokas (2009)

The Distribution Strategy

The distribution strategy involves a number of decisions which are intended to determine how the company will serve the market and customers with its products and services (Pagh & Cooper, 1998; Stock & Lambert, 2001; Wanke, 2004). Such decisions must be consistent with the business strategy and the specifications of the client. For this research, four attributes have been listed (Chart 3) for the distribution strategy, two decisions pertaining to the more technical side of logistics - **Centralized Distribution and Responsiveness to the Customer**, and two belonging to the attitudes-service composite **Customer Oriented** and **Company-Customer Operating Collaboration**.

Chart 3: Theoretical and Conceptual References for the Distribution Strategy Attributes

Distribution Strategy Attributes	Conceptual and Theoretical Approach	Authors
Centralized Distribution	The results of this practice are: shorter and more reliable lead-times, lower inventory costs, constant transport costs and the more rapid introduction of new products.	Loomba (1998); Pagh and Cooper (1998)
Responsiveness to the Customer	It appears as an attribute of the service, being a component of market or client orientation, which has been measured using scales like MARKOR, SERVQUAL and SERVPERF.	Kohli, Jaworski and Kumar (1993); Parasuraman, Zeithaml and Berry (1985); Van Donk and Van Der Vaart (2007)
Customer Orientation	Involves a set of critical actions for company competitiveness that are intended to support the client: after-sales service, customized customer service, distribution logistics, information supplied on request, review of the delivery schedule, customer satisfaction assessment.	Blesa and Bigné (2005); Kohli et al. (1993); Mentzer, Rutner and Matsuno (1997); Saura, Francés, Contrí and Blasco (2008); Tucker (1994)
Company-Customer Operational Collaboration	This supplier-customer interaction tends to be marked by: information sharing on demand (quantity, delivery time and price) and regarding forecasts of demand and sales, exclusively commercial relationship.	Cousins (2005); Parker and Anderson Jr. (2002); Ring and Van De Ven (1992)

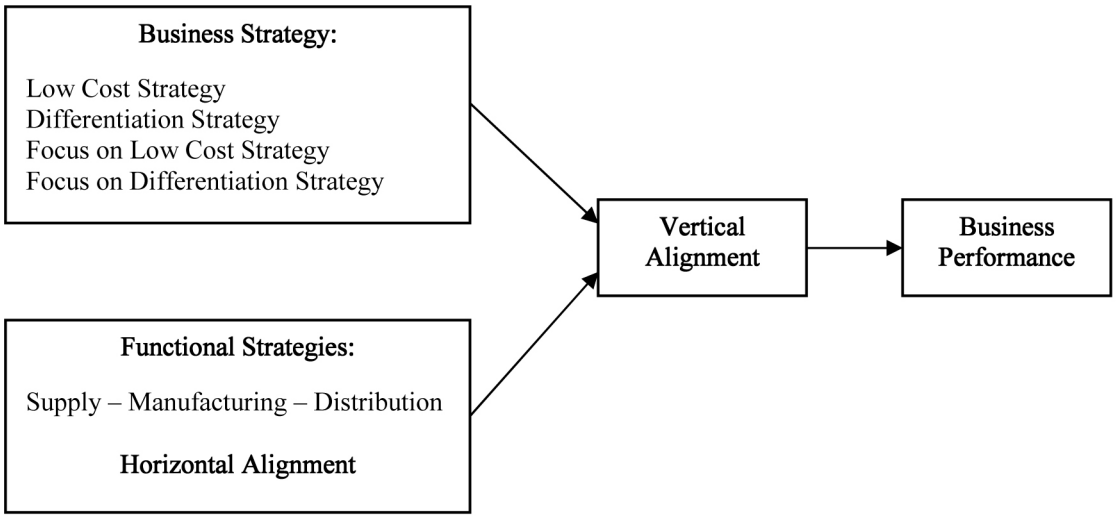
Alignment of Supply, Manufacturing and Distribution with the Business Strategy

Strategic alignment became a focus of study when it was found that companies in which the organizational structures were suitably adjusted to the business strategy performed better than others (Chandler, 1962; Rumelt, 1974). Since then, specific studies have been carried out on the alignment of resources and internal processes with business strategy and competitive advantage (Croteau & Bergeron, 2001; Decoene & Bruggeman, 2006; Defee & Stank, 2005; Edelman, Brush & Manolova, 2005; Scherpereel, 2006; Sussland, 2003; Venkatraman, 1989).

Figure 1 shows the alignment model that guides the following research question: *Does having the supply, manufacturing and distribution practices aligned with each other and with the business strategy lead firms to perform better?*

Vertical alignment (Figure 1) is achieved when the supply, manufacturing and distribution sub-strategies are developed in such a way as to reflect the business strategy (Hax & Wilde II 2001; Kathuria, Joshi & Porth, 2007). Horizontal alignment (Figure 1) becomes apparent when the development of a practice within a sub-strategy enables or supports the development of a practice in another sub-strategy, all of which are shaped by a particular business strategy (Venkatraman & Camillus, 1984). Studies have shown that the greater the horizontal and/or vertical alignment within a company the better it tends to perform in relation to its main competitors (Mcadam & Bailie, 2002; Sun & Hong, 2002).

Figure 1: Alignment in the Research Model



Theoretical Frameworks for the Analysis of Vertical and Horizontal Alignment

The four generic theoretical profiles that define the degree to which each variable in each functional strategy - supply, manufacturing and distribution - should be emphasized by the firms in the context of the four generic business strategies - low cost, differentiation, focus on low cost and focus on differentiation - are presented in Chart 4. These theoretical profiles were constructed based on a review of the literature together with the generic strategies from Porter (1989) and in studies using his typology (Allen & Helms, 2006; Miller & Friesen, 1986).

In Chart 4, the "+" sign suggests that the company should give more emphasis to that aspect of supply, manufacturing or distribution, if it is more directed towards that strategy. "Emphasis" means a "heavily biased action" by the company to develop that aspect. The "-" sign suggests that the company should not emphasize this point because it is not theoretically consistent with the scope of the dominant strategy. The symbol "0" means that aspect is irrelevant for the development of that strategy.

Chart 4: Theoretical Frameworks of Alignment of Supply, Manufacturing and Distribution with the Generic Business Strategies

Attributes of Supply, Manufacturing and Distribution	**Generic Business Strategies**			
	Low Cost	**Differentiation**	**Focus on Differentiation**	**Focus on Low Cost**
Supply 1) *Strategic Relationship with Suppliers - (RS)*	-	+	+	0
2) *Strategic Selection of Suppliers - (SS)*	-	+	+	0
3) *Alternative Suppliers – (AS)*	+	-	0	+
4) *Traditional Purchasing Process – (TP)*	+	-	-	+
Manufacturing 1) *Constant Capacity– (CC)*	+	-	-	+
2) *Flexible High Technology – (FT)*	-	+	+	0

3) *Vertically Integrated Production – (VP)*	+	-	0	+
4) *Specialized Facilities – (SF)*	-	+	+	+
Distribution 1) *Centralized Distribution– (CD)*	+	-	0	+
2) *Customer Oriented – (CO)*	-	+	+	+
3) Responsiveness to the Customer – (RC)	-	+	+	+
4) *Company-Customer Operational Collaboration – (OC)*	+	-	-	+

Research Methodology

This study is descriptive in nature and culminates in the development of all study employing a survey (Gil, 1999). The survey was conducted among industrial enterprises belonging to the metal-working sector in Caxias do Sul, Brazil. Of the 2,500 companies registered with the SIMECS (Union of Metallurgical, Mechanical and Electrical Material de Caxias do Sul), 500 responded to questions from the questionnaire by telephone. The respondent in each company had to be the company owner, the production manager or the sales/marketing manager.

Scales of the Survey Questionnaire

The questionnaire used to gather the data consisted of 17 variables-attributes for which scales were used containing multiple measurement items, whose scores were then standardized from 0 to 1 and represented the corresponding variable. Some of the scales are original, some adapted and previously validated, and some were developed from the literature review (Charts 1, 2 and 3) and their purpose is to identify the use of strategic practices by companies. For the variables of the business strategy and the attributes of the supply, manufacturing and distribution, the original scales used to collect data were interval of intensity ranging from 1 to 5 where 1 = totally disagree and 5 = totally agree. For the variables of business performance, a scale was used in order to measure the comparative performance of the interviewed company in relation to its major competitors, where 1 = much worse than competitors and 5 = much better than the competitors.

Validation of the Scales in the Survey Questionnaire

The **Content validity** or expression is meant to subjectively evaluate the degree to which the questions are understood (Hair, Anderson, Tatham & Black, 2005). To meet this requirement two verbal comprehension pre-tests were carried out with the first version of the questionnaire. Two university professors, one a PhD in Production Engineering and the other a PhD in Administration were involved. Some measuring items were replaced and others were eliminated because they failed to meet the required **orthogonality** of the remaining items in the same variable.

The **unidimensionality** of multiple scales for each of the 17 variables and **internal reliability** of the questionnaire were analyzed using two statistical tests involving pre-exploratory factor analysis with the principal components extraction method. Unidimensionality assumes that the items of the same scale or variable should be strongly associated with each other and represent a single concept (Hair et al., 2005; Malhotra, 2001). The reliability of the scale was assessed using Cronbach's Alpha (Hair et al., 2005). The first statistical pre-test was conducted with 40 students attending an MBA course in Production Strategy. The second statistical pre-test was conducted with 50 companies from within the study population.

Calculating the Alignment in the Research Model

Two approaches from Venkatraman (1989) were used to analyze the alignment in the research: *Gestalt* and the Profile Deviation in relation to the Theoretical Profile. In the *Gestalt* perspective, the horizontal alignment was evaluated through analysis of the correlation between the attributes-variables of the supply, manufacturing and distribution functional strategies in the specific context of each business strategy while taking into account the constructed Theoretical Profiles (Chart 4).

In the Profile Deviation Perspective, the misalignment or Euclidean distance is obtained from the

square root of the square of the difference between the score of each variable of the interviewed company for the attributes of the supply, manufacturing and distribution in the context of its dominant business strategy and the ideal theoretical values. The "+" and "-" signs and the symbol "0" that appear in Chart 4 assume, in the misalignment formula, the following numeric values: (+) = 1; (0) = 0.5, (-) = 0. The rate of alignment is obtained by subtracting the score of the theoretical maximum misalignment with that business strategy and the score of misalignment obtained in each respondent company in relation to that same business strategy (Kathuria et al., 2007; Sabherwal & Chan, 2001):

Alignment in each company = (Score for the maximum theoretical misalignment) – (Score for the misalignment obtained in each company).

The alignment score is sensitive to the scale used, so the values of the variables were standardized so as to vary in a range from 0 to 1. The misalignment formulas corresponding to the theoretical profiles of the four business strategies presented in Chart 4 are described in the following formulas (1) to (4).

Misalignment in the context of the Low Cost *(LC)* Business Strategy:

$$(1)\ M_{(LC)} = \text{root}\{\overbrace{[(X_{RS}-0)^2 + (X_{SS}-0)^2 + (X_{AS}-1)^2 + (X_{TC}-1)^2]}^{\text{supply attributes}} + \overbrace{[(X_{CC}-1)^2+(X_{FT}-0)^2 + (X_{VP}-1)^2 + (X_{SF}-0)^2]}^{\text{manufacturing attributes}} + \underbrace{[(X_{CD}-1)^2 + (X_{CO}-0)^2 + (X_{RC}-0)^2 + (X_{OC}1)^2]}_{\text{distribution attributes}}$$

Misalignment in the context of the Differential (*D)* Business Strategy:

$$(2)\ M_{(D)} = \text{root}\{\overbrace{[(X_{RS}-1)^2 + (X_{SS}-1)^2 + (X_{AS}-0)^2 + (X_{TP}-0)^2]}^{\text{supply attributes}} + \overbrace{[(X_{CC}-0)^2+(X_{FT}-1)^2 + (X_{VP}-0)^2 + (X_{SF}-1)^2]}^{\text{manufacturing attributes}} + + \underbrace{[(X_{CC}-0)^2 + (X_{CO}-1)^2 + (X_{RC}-1)^2 + (X_{OC}-0)^2]}_{\text{distribution attributes}}\}$$

Misalignment in the context of the Focus on Differentiation (*FD)* Business Strategy:

$$(3)\ M_{(FD)} = \text{root}\{\overbrace{[(X_{RS}-1)^2+(X_{SS}-1)^2+(X_{AS}-0{,}5)^2+(X_{TP}-0)^2]}^{\text{supply attributes}} + \overbrace{[(X_{CC}-0{,}5)^2+(X_{FT}-1)^2 + (X_{VP}-0{,}5)^2 + (X_{SF}-1)^2}^{\text{manufacturing attributes}} + \underbrace{[(X_{CD}-0{,}5)^2 + (X_{CO}-1)^2 + (X_{RC}-1)^2 + (X_{OC}-0)^2]}_{\text{distribution attributes}}\}$$

Misalignment in the context of the Focus on Low Cost (*FC)* Business Strategy:

$$(4)\ M_{(FC)} = \text{root}\{\overbrace{[(X_{RS}-0{,}5)^2+(X_{SS}-0{,}5)^2+(X_{AS}-1)^2+(X_{TP}-1)^2]}^{\text{supply attributes}} + \overbrace{[(X_{CC}-1)^2+(X_{FT}-0{,}5)^2 + (X_{VP}-1)^2 + (X_{SF}-1)^2]}^{\text{manufacturing attributes}} + + \underbrace{[(X_{CD}-1)^2 + (X_{CO}-1)^2 + (X_{RC}-1)^2 + (X_{OC}-1)^2]}_{\text{distribution attributes}}\}$$

In order for all the alignment scores in each respondent company to also vary from 0 to 1, the formulas used to calculate the alignment within the context of each business strategy are presented in sequence from (5) to (8).

For the Low Cost Strategy in formula (1), by replacing each variable with maximum values that contrast to the theoretical value in each term of the formula, the theoretical maximum misalignment for the Low Cost Strategy equals 3.46, then, formula (5) for the alignment of each respondent company with the Low Cost Strategy is equal to:

(5) $A_{(LC)} = 1 - (M_{(LC)}$ obtained in each company / 3.46)

The formulas for the calculation of alignment with other Business Strategies, by similarity, are presented in (6) (8).

Alignment in the context of the Differentiation Business Strategy (*D*):

(6) $A_{(D)} = 1 - (M_{(D)}$ obtained in each company / 3.46)

Alignment in the context of the Focus on Differentiation Business Strategy (*FD*):

(7) $A_{(FD)} = 1 - (M_{(FD)}$ obtained in each company / 3)

Alignment in the context of the Focus on Low Cost Business Strategy (*FC):*

(8) $A_{(FC)} = 1 - (M_{(FC)}$ obtained in each company / 3.12)

The Research Model Variables

The standardized scores of the variable Business Performance represented the dependent variable in the analysis of the vertical alignment (Figure 1) and the standardized scores of the vertical alignments with their respective business strategies - $A_{(LC)}$, $A_{(D)}$, $A_{(FD)}$, $A_{(FC)}$, represented the independent variables. The standardized scores of the original variables (Table 2), the attributes of Supply Strategy, Production Strategy and Distribution Strategy, were also used in order to be interrelated in the analysis of the horizontal alignments.

Statistical Techniques employed in the Analysis of the Research Model

Exploratory factor analysis was used together with Cronbach's alpha to confirm the validity of the scales of the variables and the questionnaire in the field research. Pearson's method of bi-variate correlation was used in the analysis of the horizontal alignments (*Gestalt*) in which the variables-attributes of the Supply, Production and Distribution and Strategies were related to each other. Multiple Linear Regression was used to establish the relationship among the supply, manufacturing and distribution attributes, and the dependent variable, business strategy.

Results

Final Sample

When sifting the data, cases in which all the items of a variable remained unanswered were excluded, thus negating the variable, likewise in cases with marking problems and bias in the responses. There was no confirmation of outlier cases. The final sample (*N*) consisted of 400 cases and was shown to be representative of the study population (Table 1), since the metal-working sector is previously characterized by a significant predominance of small businesses (SEBRAE, 1999), formed in supply chains and belonging to the metallurgical sub-sector.

Table 1 – Characteristics of the Metal-working Companies

Nr. Of Employees	Size of the companies	Frequency	%
2 a 19	Micro	277	69.25
20 a 99	Small	83	20.75
100 -500	Medium	13	3.25
Over 500	Large	4	1.00
Total	**-**	***400***	***100***
Industrial Subsector		**Frequency**	**%**
Metallurgical Industry		327	81.8
Mechanical Industry		57	14.3
Electrical material and communications		10	2.5
Transport Material		6	1.5
Total		***400***	***100***

Types of Customers	Frequency	%
Other industrial firms	271	67.8
Trade or service firms	83	20.8
Consumer or individual end user	46	11.4
Total	***400***	***100***

Validation of the Scales in the Study Sample

In Table 2, it can be seen that, with the exception of "Focus on Differentiation Strategy" all the other variables had Cronbach's alpha scores greater than 0.600, meaning that the items measuring the multiple scales of the variables are sufficiently interrelated to represent such variables. Some variables are also shown to have an explanatory power below 50%, which is the pre-set minimum percentage for the explained variance of each variable. Since none was below 40%, the analysis involving these variables must be carefully examined. The KMO index of all the variables was above 0.600, which is the minimum acceptable value for adequacy of the factor analysis because the study is descriptive in character (Hair et al., 2005; Malhotra, 2001).

Table 2 – Unidimensionality and Reliability of the Scales in the Study Sample

Variables of the research model	*Cronbach's* alpha	Eigenvalue	Explained variance (%)	KMO
I) Attributes of the Business Strategy				
1) Differentiation Strategy	0.834	3.300	55.00	0.810
2) Low Cost Strategy	0.700	2.284	45.68	0.737
3) Focus on Differentiation Strategy	0.599	1.669	41.73	0.604
4) Focus on Low Cost Strategy	0.687	2.287	45.75	0.734
II) Attributes of the Manufacturing Strategy				
5) *Constant Capacity*	0.710	2.334	46.68	0.737
6)*Flexible High Technology*	0.823	2.966	59.31	0.831
7)*Vertically Integrated Production*	0.727	2.411	48.21	0.724
8)*Specialized Facilities*	0.851	3.172	63.43	0.809
III) Attributes of the Supply Strategy				
9)*Strategic Relationship with Suppliers*	0.826	2.975	59.49	0.808
10)*Strategic Selection of Suppliers*	0.832	3.006	60.11	0.852
11)*Alternative Suppliers*	0.781	2.673	53.46	0.802
12)*Traditional Purchasing Process*	0.688	2.280	45.60	0.763
IV) Attributes of the Distribution Strategy				
13)*Centralized Distribution*	0.902	3.610	72.20	0.874
14)*Customer Oriented*	0.837	3.098	61.95	0.849
15)*Responsiveness to the Customer*	0.852	3.171	63.41	0.862
16)*Company-Customer Operational Collaboration*	0.832	3.002	60.04	0.817

V) Company Performance Measures				
17) *Business Performance*	0.893			
Net Profit in 2008				
Gross Sales Revenue in 2008				
Productivity in 2008		3.530	70.60	0.872
Sales Growth in 2008				
Market Share in 2008				

N = 400 valid cases. The overall Cronbach's alpha for the questionnaire is 0.93.

Assumption Inherent to the Multivariate Statistical Analysis

Analyses of the statistical assumptions of data normality, linearity between dependent and independent variables, equal variance over the entire domain of the independent variable, low multicollinearity among independent variables (Hair et al., 2005) were conducted with the scores for the variables previously standardized from 0 to 1.

Classification of the companies according to the dominant business strategy

The highest standardized score obtained from among the four variables of strategy was defined as the business strategy of each company. Five classes of business strategy were stratified in the study sample. Class 5 was formed by companies with scores tied in two or more business strategies (Figure 2). In more than 80% of the companies participating in the research the predominant business strategy was found to be that of low cost *(LC)*, Classes 1 and 2.

Figure 2: Descriptive Analysis of the Companies classified according to Business Strategies

Class 1 ***Low Cost Strategy (LC)*** 130 companies 82.3% belong to the Metallurgical Industry 69.2% have other industrial companies as clients 60.8% have up to 10 employees 3.2% have between 100 to 500 employees	Class 2 ***Focus on Low Cost Strategy (FC)*** 197 companies 82.2% belong to the Metallurgical Industry 66.5% have other industrial companies as clients 64.5% have up to 10 employees 3.5% have 100 to 2300 employees
Class 3 ***Focus on Differentiation Strategy (FD)*** 53 companies 83% belong to the Metallurgical Industry 71.7% have other industrial companies as clients 56.6% have up to 10 employees 3.8% have 150 to 400 employees	Class 4 ***Differentiation Strategy (D)*** 5 companies 80% belong to the Metallurgical Industry 60% have other industrial companies as clients 40% have up to 12 employees 20% have 2000 employees

Class 5

More than one Strategy

15 companies

66.7% belong to the Metallurgical Industry
60% have other industrial companies as clients
60% have up to 10 employees
20.1% have 90 to 170 employees

Horizontal Alignment in the Classes of Business Strategies

The internal consistency between the strategic supply, manufacturing and distribution practices (dyadic relationships) was assessed in accordance with the *Gestalt* perspective (Venkatraman, 1989) through bivariate correlation analysis (Figure 3) between the respective original variables.

In this analysis, only the relationships that correlated > 0.300 with a significance level of 0.05 and mutually consistent according to theoretical profile were presented. Based on the results in Figure 3, Class 3, corresponding to companies classified in the Focus on Differentiation Strategy presented the largest number of consistent relationships.

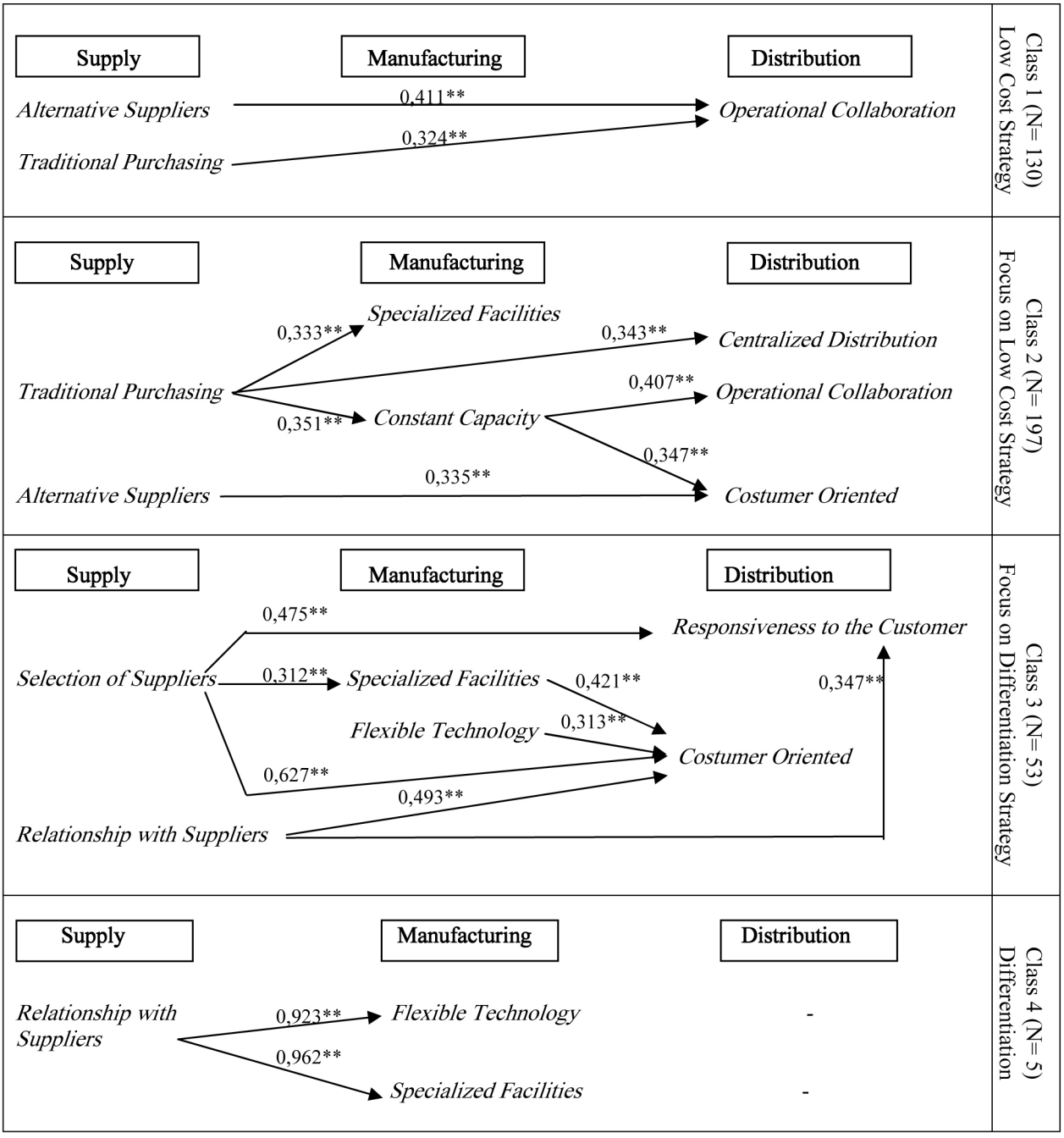
It is worth mentioning that no theoretical profile was developed beforehand for Class 5, More Than One Business Strategy, due to the difficulty of faithfully representing ambiguous practices. Thus, it was not possible to obtain consistent relations in this class of strategy. Class 4, Differentiation Strategy, shows the highest correlations between practices. Such correlations should be interpreted with caution due to the insufficiency of the sample size. In Figure 3, there is a trend for the relations between practices to be more present in the Supply - Distribution dyad than in the other two dyads, Supply - Production and Production - Distribution.

Vertical Alignment and Business Strategy Relationship

To check the internal consistency of the practices with the prevailing business strategy, linear regression was performed, in which the dependent variable is the business strategy and the independent variables are the functional practices of the supply, manufacturing and distribution strategies.

According to Table 3, the variables or attributes *Flexible High Technology (FT), Strategic Selection of Suppliers (SS)* and *Responsiveness to the Customer (RC)* were able to explain 39.8% in the dependent variable of Focus on Low Cost Strategy. However, only the variable-attribute *Responsiveness to the Customer (RC)* is consistent with the theoretical profile of Focus on Low Cost Strategy of Chart 4, and is also the biggest contributor to the overall model Focus on Low Cost Strategy, with a linear combination coefficient of 0.404. The linear regression model for the dependent variable Focus on Differentiation Strategy (Table 3) can be explained in 60.9% by the variables-attributes, *Vertically Integrated Production (VP), Responsiveness to the Customer (RC)* and *Customer Oriented (CO)*. The attribute *Responsiveness to the Customer (RC)* is also the most significant for the development of the Focus on Differentiation Strategy, since its linear combination coefficient has the highest value in relation to other variables in the model, $\Leftarrow$ = 0.456. Only the *Responsiveness to the Customer (RC)* and *Customer Oriented (CO)* achieve this internal consistency with this strategy.

Figure 3: Correlations in the functional dyads within the classes of Business Strategy



Pearson's Correlation. ** Significance at 0.01 two-tailed. Linear regression by the Enter method.

In Class 1, the Low Cost Strategy, the regression model had a low percentage of explanatory power (9.3%) by the only significant variable, *Flexible High Technology (FT)* which is not consistent with the theoretical profile of the Low Cost Strategy.

For Class 4, Differentiation Strategy, it was not possible to obtain a regression equation, due to the lack of cases in the sample. For Class 5, More Than One Business Strategy, the standardized score of each strategy (*LC, FC, D, FD*) was taken, one at a time as the dependent variable in linear regression analysis, and none of the attributes of the supply, manufacturing and distribution were found to have a linear combination coefficient with a minimum significance of 0.05 with any business strategy.

Statistical analysis according to the required parameters for significance and representativeness of the samples showed a tendency of the companies that are predominantly directed towards the Focus on Differentiation Strategy and Focus on Low Cost Strategy to have higher internal consistency between the supply, distribution and manufacturing practices and greater consistency among some internal practices for the development of the respective strategies.

Table 3: Multiple Linear Regressions for the evaluation of the Vertical Alignment

Classes of Business Strategy	Dependent Variable	*R*	R^2	*F*	*Sig. of F*	*b Coefficients*	Sig. of *b*
Class 1 – Low Cost *N = 130*	Score of the Low Cost Strategy	0.305	0.093	13.133	0.000	Const= 0.764 *FT* – 0.161	0.000 0.000
Class 2 – Focus on Low Cost *N = 197*	Score of the Focus on Low Cost Strategy	0.631	0.398	42.513	0.000	Const= 0.357 *FT* – 0.107 *SS* – 0.108 ***RC* – 0.404**	0.000 0.000 0.004 0.000
Class 3 – Focus on Differentiation *N = 53*	Score of the Focus on Differentiation Strategy	0.780	0.609	25.395	0.000	Const= 0.104 *VP* - 0.243 ***RC* - 0.456** ***CO* - 0.183**	0.250 0.000 0.000 0.034
Class 4*– Differentiation *N = 5*	-	-	-	-	-	-	-

Linear Regression by the Enter Method.

Standardized scores from 0 to 1 were used for all the independent and dependent variables.

*Multiple linear regressions were not performed due to the insufficient sample size.

– Variables of the model that are consistent with the theoretical profile constructed for this strategy (Chart 4).

Alignment versus Business Performance

The key question is to see which alignments with the theoretical profiles of the business strategies are related to business performance (Figure 1). This analysis was conducted using bivariate correlation with Pearson's correlation coefficient and a significance limit of 0.05 (Table 4) between the independent variable, the alignment with business strategies ($A_{(LC)}$, $A_{(FC)}$, $A_{(D)}$, $A_{(FD)}$) in the total sample and the stratified samples of class of strategy (Figure 2), and the dependent variable of the research model, the business performance. The business performance matched the standardized score of the sub-variables profitability, gross sales revenue, productivity, sales growth and market share.

Table 4: Correlation of the Alignment with the Strategies and the Business Performance

Class of Business Strategy	Related Variables	Pearson's Correlation Coefficient	Significance *two-tailed*
Global Sample *N* = 400	$A_{(LC)}$ *and Performance*	- 0.060	0.230
	$A_{(FC)}$ *and Performance*	**0.251**	**0.000**
	$A_{(FD)}$ *and Performance*	-0.062	0.215
	$A_{(D)}$ *and Performance*	**0.235**	**0.000**

Class 1 – Low Cost *N = 130*	$A_{(LC)}$ *and Performance*	-0.113	0.202
Class 2 – Focus on Low Cost *N = 197*	$A_{(FC)}$ *and Performance*	**0.218**	**0.002**
Class 3 – Focus on Differentiation *N = 53*	$A_{(FD)}$ *and Performance*	-0.201	0.149
Class 4 – Differentiation *N = 5*	$A_{(D)}$ *and Performance*	0.407	0.497

Scores standardized from 0 to 1.

The results in Table 4 revealed a trend towards improved performance with the increase in the alignment of supply, manufacturing and distribution with the Focus on Low Cost Strategy. A significant correlation at the 0.05 level between alignment and the Differentiation Strategy in the global sample was not confirmed in the stratified sample of the same strategy. The insufficient sample size constitutes a limitation to the results with this strategy.

2. DISCUSSION OF THE RESULTS

Upon analyzing the results, based on the theoretical profiles constructed for each business strategy, it was found that few of the supply, manufacturing and distribution practices contained in this research showed a significant relationship ($p \leq 0.05$) with each other with a correlation above 0.500 (Figure 3). This correlation would provide greater reliability in order to assert that a particular practice, when developed in a functional strategy allows the development of another practice in another functional strategy. Functional practices with significant correlations with each other are present in Classes of Low Cost, and Focus on Differentiation Strategies (Figure 3).

The linear regression (Table 3) indicated that the *Strategic Selection of Suppliers (SS)* practice in supply, the *Flexible High Technology (FT)* in manufacturing and *Responsiveness to the Customer (RC)* in distribution had an explanatory power of almost 40% in the Focus on Low Cost Strategy. Likewise, the *Vertically Integrated Production (VP)* practice in manufacturing, *Responsiveness to the Customer (CR)* and *Customer Oriented (CO)* in distribution explained 60.9% in the Focus on Differentiation Strategy. *Responsiveness to the Customer (RC)* emerged as a common practice which contributes to reaching targets both in the low cost and differentiation strategies. By the way, only in the alignment of the supply, manufacturing and distribution with Focus on Low Cost Strategy there was trend to obtain better performance.

3. FINAL REMARKS

Whereas firms rarely adopt a pure strategy, the results revealed that of the 400 companies in the sample, 96.25% (385 cases) had a dominant Business Strategy, and in the remaining 3.75% (15 cases) there was no single predominant strategy, but the coexistence of two or more strategies developed by the respective companies. In most firms (81.75%) the actions were predominantly directed towards cost, 32.5% for Low Cost and 49.25% for the Focus on Low Cost. Most of these companies, as well as other members of the other classes of business strategy within the metallurgical industry sub-sector, have up to 10 employees and other industrial companies as their main customers (Figure 2). These results corroborate a particular feature of this population - most companies in the metal-working sector in Caxias do Sul are members of large supply chains.

4. LIMITATIONS OF THE STUDY

The indices involving the alignment are dependent on the theoretical profiles constructed for the Business of Low Cost, Focus on Low Cost, Differentiation and Focus on Differentiation Strategies. Given the subjectivity involved when considering the emphasis attributed to the use of each practice in each Business Strategy (the "+", "_", "0" in Chart 4) and the risk of researcher bias in interpreting the approaches relat-

ing to business and functional strategies, there may be failures in the preparation of profiles and consequently the theoretical calculations of alignment.

The sample proved to be representative of the industry and significant in relation to the size, 400 cases, equivalent to 16% of the study population and yet, the analyses of the results are valid for all the studied companies.

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