FEDERAL UNIVERSITY OF SANTA MARIA
TECHNOLOGY CENTER
POSTGRADUATE PROGRAM IN PRODUCTION ENGINEERING

Adriana Yolanda Morales Garza

MODEL FOR STRATEGIC ANALYSIS OF COMPANY'S PARTNERSHIPS

Santa Maria, RS
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Dissertation work presented to the course of Post-Graduation in Production Engineering of the Federal University of Santa Maria (UFSM, RS) as a requirement for the obtention of the Degree of Master in Production Engineering.

Advisor: Prof. Dr. Andreas Dittmar Weise

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Morales, Adriana Yolanda
Model for Strategic Analysis of Company's Partnerships / Adriana Yolanda Morales.- 2018.
90 p.; 30 cm

Orientador: Andreas Dittmar Weise
Dissertação (mestrado) - Universidade Federal de Santa Maria, Centro de Tecnologia, Programa de Pós-Graduação em Engenharia de Produção, RS, 2018

1. Alianças Estratégicas 2. Modelo para avaliação de alianças estratégicas I. Dittmar Weise, Andreas II. Título.

Sistema de geração automática de ficha catalográfica da UFSM. Dados fornecidos pelo autor(a). Sob supervisão da Direção da Divisão de Processos Técnicos da Biblioteca Central. Bibliotecária responsável Paula Schoenfeldt Patta CRB 10/1728.

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Approved in January 12th 2018

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Santa Maria, RS
2018

ACKNOWLEDGEMENTS

My deep gratitude goes to my advisor, Dr. Andreas Dittmar Weise, who gave me the opportunity to complete a master's degree in a foreign country, which was one of my goals in life, and who steered me in the right direction whenever I needed help. Without his guidance this dissertation would not have been possible.

To Dr. Rodolfo Reinaldo Hermes Petter, for his willingness to help and share his knowledge about models for the evaluation of the performance of strategic alliances with me.

To my parents, for supporting all my decisions, even when they meant being away from them. I am what I am thanks to them.

I must express my very profound gratitude to my boyfriend Ricardo Simão Diniz Dalmolin Jr. for being a constant source of motivation in my life.

To the family Diniz Dalmolin, for all their love and support during the development of this master thesis.

I would also like to thank the Federal University of Santa Maria, for opening me the doors of this great university and providing me with resources for the development of this master thesis.

ABSTRACT

MODEL FOR STRATEGIC ANALYSIS OF COMPANY'S PARTNERSHIPS

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ADVISOR: PROF. DR. ANDREAS DITTMAR WEISE

Globalization has caused an increase in market competition; because of this, in the last decades, firms have been looking for different ways to survive and generate high profits. Strategic alliances have become popular among corporations, as a way to reduce costs, gain knowledge, generate more innovative products, obtain different distribution channels, among other advantages. However, these types of organizations are not always successful. There is a lack of models in the literature that can evaluate the performance of partnerships and of each individual company making part of it. Thus, this study aims to develop a new generic model that can evaluate the performance of horizontal and vertical alliances, and also provide information about the business strategy that each different alliance should focus on to improve its performance. The new 3D model is based on two existing models, the Weise Model (2005) and the Petter Model (2012). In order to prove its applicability, it was implemented in two different strategic alliances in Santa Maria, RS, Sonnen Energia and APL - Metal Centro. Results from the evaluation of the performance of these two strategic alliances using the 3D Model, provide the users key information to ensure success in their short and long-term goals.

Keywords: Partnerships; Strategic Alliances; Competitiveness; Business Strategies

RESUMO

MODELO PARA AVALIAÇÃO ESTRATÉGICA DE REDES DE COOPERAÇÃO

AUTOR: ADRIANA YOLANDA MORALES GARZA

ORIENTADOR: PROF. DR. ANDREAS DITTMAR WEISE

A globalização provocou um aumento da concorrência no mercado; devido a isto, nas últimas décadas, as empresas têm buscado diferentes maneiras de sobreviver e gerar altos lucros. As alianças estratégicas tornaram-se populares entre as corporações, como forma de reduzir custos, obter conhecimento, gerar produtos mais inovadores, obter diferentes canais de distribuição, entre outras vantagens. No entanto, esses tipos de organizações nem sempre são bem-sucedidos. Há uma falta de modelos na literatura que possam avaliar o desempenho de parcerias e de cada empresa individual fazendo parte dela. Assim, este estudo pretende desenvolver um novo modelo genérico que possa avaliar o desempenho de alianças horizontais e verticais e fornecer informações sobre a estratégia de negócios em que cada aliança deve se concentrar para melhorar seu desempenho. O novo modelo 3D baseia-se em dois modelos existentes, o modelo Weise (2005) e o modelo Petter (2012). Para provar sua aplicabilidade, foi implementado em duas alianças estratégicas diferentes em Santa Maria, RS: Sonnen Energia e APL - Metal Centro. Resultados da avaliação do desempenho dessas duas alianças estratégicas usando o modelo 3D, fornecem aos usuários informações importantes para garantir o sucesso em seus objetivos de curto e longo prazos.

Palavras-chave: Parcerias; Alianças estratégicas; Competitividade; Estratégias de negócios

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1 INTRODUCTION

In this chapter, the main aspects of this study will be discussed. First of all, contextualization of the topic will be explained, then the main problem regarding performance of partnerships will be defined, after this, research objectives will be presented and lastly, the relevance of the research will be explained.

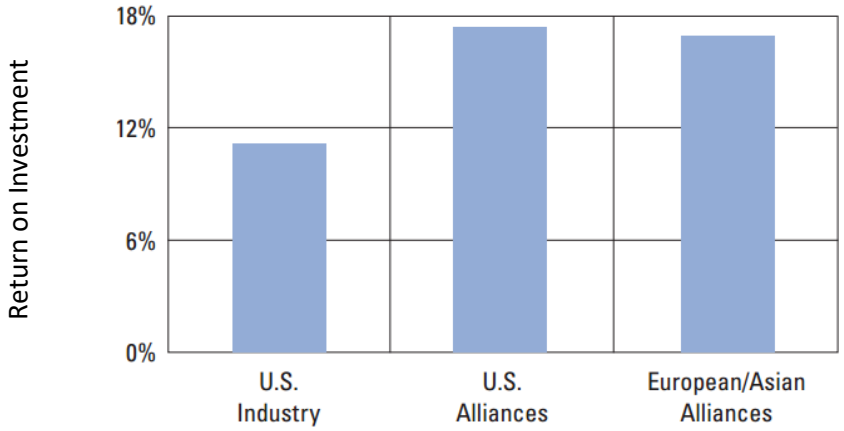
1.1 Contextualization

In the last decades, firms have been facing new challenges mainly due to globalization which generated an increase in market competition. There has been an increasing demand for costs reduction, value product innovations, better quality standards in production and this has made companies to focus on competitive strategies. The formation of partnerships between firms has been seen as a common way for companies to find and maintain competitive advantage (MOHR; SPEKMAN, 1994). Gulati (1998) describes an alliance as a voluntary collaboration between independent firms that involve exchange of knowledge, technology and product development, exchange of products, services and information to approach common objectives. Jack Welch, former CEO of General Electric, is well known by his famous quote "*If you think you can go it alone in today's global economy, you are highly mistaken.*" Strategic alliances are established between corporations to obtain mutual benefits, like costs reductions, competition advantages, gain knowledge, enter new markets, among others. In 1988 to 1992, the company Booz Allen studied 700 companies before and after alliances and they found out the return on investment was higher after the establishment of the alliance, this is shown in Graph 1.

However, it is the view of Brinkerhoff (2002) that there is a gap in the literature involving models specifically targeted at evaluating the performance of partnership relationships. Ansari, Phillips and Hammick (2001) state that there is a need for evidence that proves partnerships effectiveness.

According to Weise et al (2009) main decisions regarding alliance formation among corporations are based on a corporate strategy. In order to select the best strategy, firms must consider, from their internal environment, their strengths and weaknesses, and from the external environment, their opportunities and threats (DAS; TENG, 2000).

Graph 1. **Comparison of Return on Investment**



Source: Booz-Allen & Hamilton, (1998, p.2)

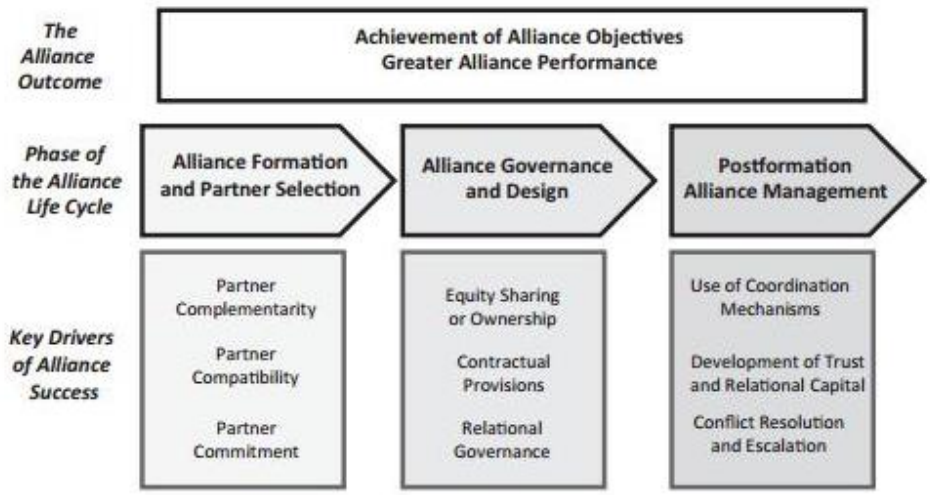
It is important for firms to identify their strengths and weaknesses to avoid risks in order to achieve strategic objectives. Bortolaso, Verschoore and Antunes (2013) describe the importance of corporate strategies in partnerships because in this type of organizations, strategies are no longer constructed in individual form, but in a collective form, approaching common goals.

For the formation of a partnership it is important to consider main success factors that could help generate positive outcomes. In Figure 1 it is presented an overview of key success factors (KSF) for the success of an alliance. Kale and Singh (2009) point out factors that are critical for an alliance success, these factors are divided in three periods of the life cycle of a partnership, being these: alliance formation, alliance governance and alliance post-formation. Partner selection is one of the main steps in the process of establishment of an alliance. A successful

strategic alliance bust be based on compatible goals and share of risks among the partners of it (BROUTHERS; BROUTHERS; WILKINSON, 1995).

Strategic alliances are a topic that has already been explored. There are several models in the literature that involve the formation process of an alliance (KASMAI; IIJIMA, 2002, LAMBERT; KNEMEYER, 2004, TUTEN; URBAN, 2001), but few of them analyze the performance of the alliance and of each firm individually (WEISE et al., 2009, PETTER, 2012).

Figure 1. **A Single Alliance: Key Success Factors**



Source: Kale and Singh (2009, p. 48)

Based on this context, and considering strengths and weaknesses of existing models in the literature, the next question arises: What would be a model, that could analyze the strategic performance of horizontal and vertical alliances and of each firm making part of a specific alliance individually?

1.2 Research Objectives

In this topic, the general objectives adopted for this research, as well as the specific objectives will be presented.

1.2.1 General Objective

The main aim of the present master thesis is to elaborate a new generic model for the analysis of horizontal and vertical partnerships.

1.2.2 Specific Objectives

The specific objectives that contribute for the general objective of this research are:

- Review literature about entrepreneurial strategies involving alliances;
- Analyze and compare existing models for the analysis of strategic alliances;
- Identify strengths and weaknesses of existing models;
- Elaborate a new generic model for the analysis of strategic alliances; and
- Evaluate the proposed model.

1.3 Research Relevance

Partnerships are becoming a popular strategy for corporations to reduce costs, acquire access to new technologies or markets, change a company's competitive position, reduce duplication of efforts, among other drivers (MOHR; SPEKMAN, 1994, MENTZER et al, 2000, LAMBERT; KNEMEYER, 2004). However, according to Zamir et al. (2014), along with the high rise in alliances there is also a high failure rate among them.

There are several studies which state that it is not uncommon for alliances to collapse, as the failure rate for this type of organizations can be as high as 70% (PORTER, 1987, ZINELDIN et al., 2015, VALANT, 2008). A clear example of an

alliance failure is the Volvo-Renault case. The authors Bruner and Spekman (1998) in their article *The Dark Side of Alliances: Lessons from Volvo-Renault* they describe the main issues that led to the collapse of the Volvo-Renault alliance. The establishment of the alliance was driven by the desire of both firms to gain competitive advantage in such a globalized industry and to reduce production costs. This alliance lasted just three years, mainly because of language and cultural differences between both firms and because of unclear strategies. Volvo and Renault managers were focused on fixing the business, ignoring main problems in the alliance. Another important aspect is that Renault was approximately four times the size of the company Volvo. Brouthers, Brouthers and Wilkinson (1995) state that symmetry is a key concept in getting to companies with different cultures together, alliances among firms work better when there is little size difference between the partners. According to Whipple and Frankel (2000) one of the main barriers for an alliance formation are the people, the costs for partners to modify their culture and adopt new ways of conducting their business are usually high.

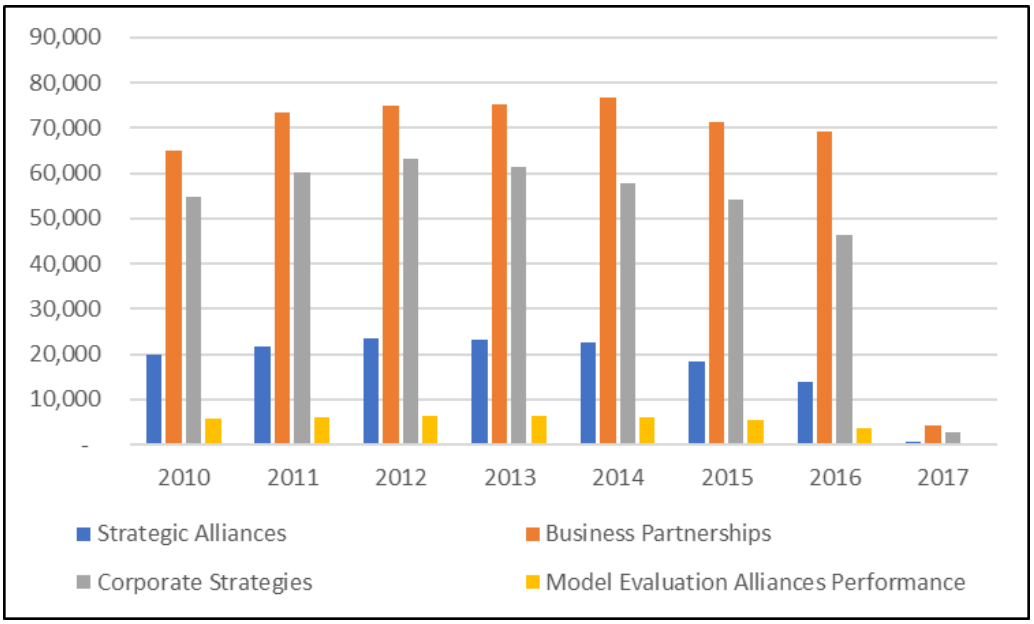
Another example of a strategic alliance failure in the automobile industry is the case of Volkswagen and Suzuki in 2009. The alliance was established in 2009 and finished in the year of 2011, it lasted less than two years. The main drivers for the formation of this alliance was technology and distribution channels sharing. According to Pandey and Kumar (2016), this alliance was ended because both firms had trouble understanding the cultural differences between them. Both companies, as well as the case of Volvo and Renault, had different organizational cultures and this made difficult the decision-making process for managers and, also, for the employees to match.

There is a lack of models in the literature which can explain the performance of strategic alliances. It is still unclear if collaborations among firms effectively enhances performance and if so, how do they do it (BRINKERHOFF, 2002). Gulati (1998) states that analyzing the performance of an alliance is as important as analyzing the performance of each firm entering an alliance.

Besides the observations made before, this study is also justified by the number of existing publications in the literature relating strategic alliances to models

for performance evaluation. In Graph 2 is demonstrated that the concepts of *strategic alliances* and *business partnerships* have been well explored in the literature in the last years, but compared to them, *models for the evaluation of alliances performance* is a topic that has deepening opportunities. The data base ProQuest was chosen because of its international scope.

Graph 2. **Number of keywords publications in ProQuest**



Source: Elaborated by the author

The relevance of this research is highly explained by the low number of publications related to the subject matter in comparison to other topics like strategic alliances, corporate strategies and business partnerships, and by the lack of existing models in the literature that can evaluate the performance of partnerships, as well as of each individual firm.

1.4 Work Structure

The present dissertation is composed from five chapters. The first one, the introduction, includes the contextualization, to provide a broad view of the research area, it also includes the general and specific objectives of this work and the relevance of the research. Following is the literature review, which is based on the description of terminology related to partnerships. Two existing models in the literature for partnerships evaluation and their main theoretical bases are discussed, as well as their main advantages and disadvantages. Next comes the methodology of the development of this master thesis. In chapter 4 the new model for the evaluation of strategic alliances' performance is presented. In the last chapter, the results from the implementation of the model in two different strategic alliances are discussed.

2 LITERATURE REVIEW

In this chapter aspects from relevant literature regarding corporate's partnerships will be discussed. First, the differences between the concepts *partnerships* and *strategic alliances* are explained. Additionally, theoretical aspects related to strategies, which are the bases for the model's structure, are analyzed, deepening in three main strategies: corporate, competitive and functional strategies. Finally, existing models in the literature are presented, Weise model (2009) and Petter model (2012).

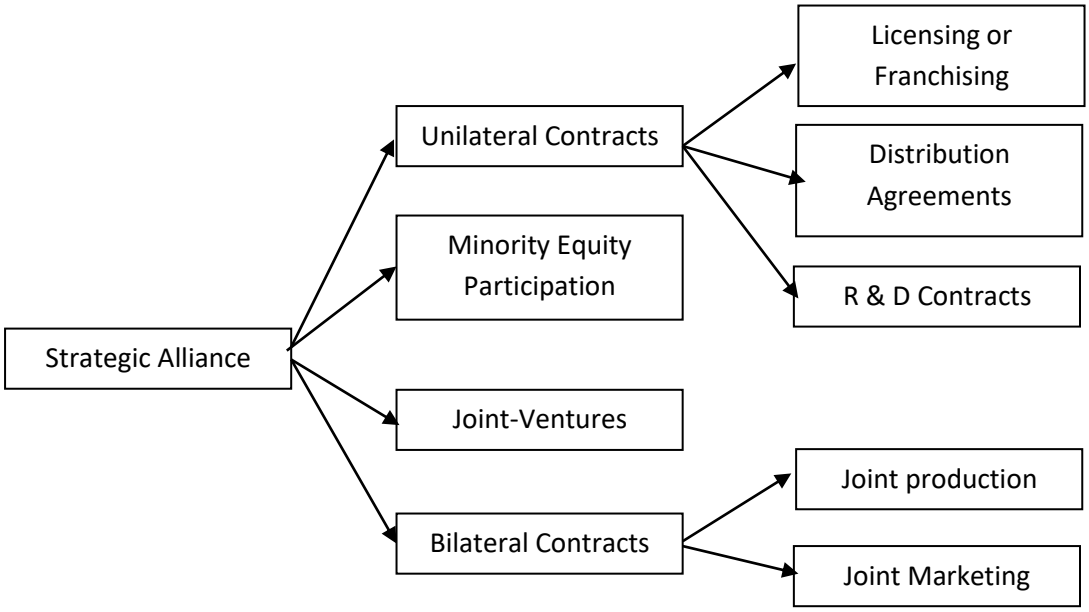
2.1 Partnerships and Strategic Alliances

The concepts of *partnership and strategic alliance* are often misunderstood. Alliances and partnerships are different forms of organization in which companies unite efforts to achieve goals, which can be common for all firms that make part of this organization, or could also be specific for each of them.

A strategic alliance is described by Gulati (1998) as a voluntary arrangement between firms involving exchange, sharing, or co-development of products, technologies or services. An alliance is a type of organization which allow partners to share risk and resources and often offer a competitive advantage (HITT et al., 2000, IRELAND; HITT; VAIDYANATH, 2002, DAS; TENG, 2000). There are different types of strategic alliances, each of them have a specific degree of collaboration and complexity. In Figure 2 are presented different types of strategic alliances which are common among firms.

According to the author Klotzle (2002), there are four main types of strategic alliances: unilateral contracts, minority equity participation, joint ventures and bilateral contracts.

Figure 2. **Types of Strategic Alliances**



Source: Adapted from Klotzle (2002)

Das and Teng (2000) have analyzed these types of alliance. They describe alliances based on unilateral contracts as firms that have defined a transfer of property rights, in this type of alliances firms use to work most of the time independently. Franchises contracts are in nature unilateral. Franchises obtain a license to use a brand or business technology in order to sell products or services. On the other hand, alliances based on bilateral contracts require cooperation and collaborative work from all the companies that form part of the alliance. This type of alliances does not apply transfer of property rights. Joint ventures are an arrangement between firms to put their resources together for accomplishing a specific task. A joint venture occurs when two or more firms pool of their resources within a common legal organization (KOGUT, 1988). When corporations agree to enter a joint venture, a new entity is created where the firms can make transactions, but they keep working as independent companies. In the last type of strategic alliance, minority equity participation, there is not a new entity created, but one or more firms take an equity position in the other firm that makes part of the alliance (BRUNET; BELZUNEGUI, 1999).

The term partnership is also a common way for companies to organize and acquire competitive advantage. In a partnership two or more firms share the revenues and costs of a venture business.

> "Partnership can be defined as a relationship either, contractually supported or otherwise, between two or more parties, each of whom shares joint and several liabilities for the actions of the whole" (Roberts and Wallace, 2011, p.6).

Partnerships vary from country to country because they are based on legal contracts, and each country has its own specific legal requirements.

For the purpose of this work, despite the differences mentioned before for the terms *partnerships* and *strategic alliance*s, these terms will be considered the same.

2.1.1 Horizontal Relationship

This type of alliances involves firms that act in the same industry and in the same level of the supply chain process. Cruijssen, Dullaert and Fleuren (2007) discuss that horizontal relationships are established often between competing firms to share information, facilities, or resources to reduce costs or improve their products or services.

Good examples of horizontal relationships are most common in the automobile industry. In the 1990's the firms Renault and Nissan decided to establish an alliance together. Both firms act in the same industry and with this alliance they intended to share knowledge and expected to generate economies of scale. By that time, Nissan showed a deterioration in profitability and market share due to mistakes in the overall product planning, while Renault showed strong financial and product performance (HELLER; FUJIMOTO, 2004). Renault's market was limited to Europe and some parts of Latin America and Nissan acted in a more international market, but it was not a leader either in Europe nor in Latin America. Both firms beneficiated from each other through the sharing of technology and knowledge.

2.1.2 Vertical Relationship

According to Mesquita and Lazzarini (2008), vertical relationships are established between firms that are specialized in a series of activities from a particular level in the supply chain process. One of the main advantages of this type of cooperation is a clear management structure, the function and responsibilities of each partner are well defined. However, vertical organizations usually have a large chain of management levels, causing difficulties in the communication. There are two main types of vertical relationship: upstream and downstream organization. An upstream or backward relationship is established when a firm search for another company that elaborates inputs that this firm uses in the production of its products. Contrary to upstream, or forward relationship, is when a firm search for a company that can manage its finished products, distributions centers are a common example in this case.

2.2 Strategies

The word strategy is a very common term in the business world, it is used to describe a number of activities of an organization to achieve specific objectives. There are different types of strategies, and it is important to identify the scope and the main characteristics of each for a proper decision making.

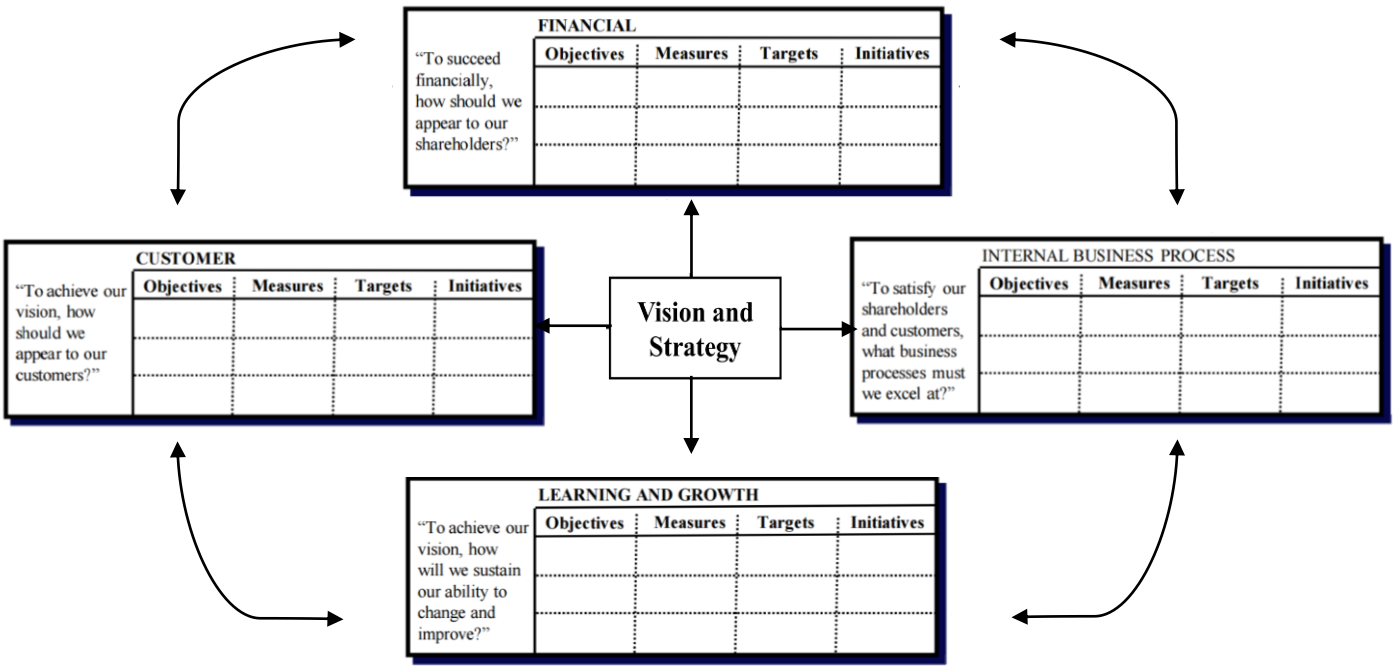
Competitive strategies, according to Tanwar (2013), are a set of actions that firm must adopt to create a defendable position in the industry. Firms search for a better competitive position in the market by implementing competitive strategies.

2.2.1 Balanced Scorecard

The Balance Scorecard is a strategic planning system introduced by Kaplan and Norton in 1992, in order to complement financial measures with three other perspectives: customers, internal business process and learning and growth

perspectives. The BSC translate a company's strategy into doable actions related to these four different perspectives. According to Kaplan and Norton (1996), the balance scorecard system has an advantage over traditional methods, which is that it links a firm's long-term vision and strategy with everyday actions. Figure 3 presents the four perspectives that are the base for this system.

Figure 3. **Four perspectives of the Balanced Scorecard**



Source: Kaplan (2009, p. 4)

a. Financial Perspective

Kaplan and Norton (1992) state that a firm must not get rid of financial measures to evaluate its performance. They argue that a well-designed financial control system can help a firm to generate higher returns. These measures are usually related to EVA, market share, profitability, cash flow, sales growth, among

others. Financial measures are a consequence of actions realized by a firm, managers should know how to translate operational improvements into financial success.

Depending on the vision and strategy of the firm, managers focus the actions towards a productivity or growth strategy. Productivity strategy involves costs reductions, usually by improving the cost structure or increasing assets utilization. A growth strategy is related to an increase in revenues, through the expansion of revenue opportunities or enhancing customer value.

It is important to note that financial measures are not enough to evaluate the performance of a firm, because the success of a firm goes beyond profitability, one should also evaluate customer satisfaction and employee motivation for example.

b. Customer Perspective

The mission and purpose of every business is to satisfy the needs of consumers (DRUCKER, 1973). The BSC considers the customer's satisfaction as an important factor of a company's strategy and vision. Customer's satisfaction is related to financial success of a firm, if customers are satisfied with the product or service sales will increase, this can be translated as positive financial results.

Kaplan and Norton (1992) mention four aspects that customers pay attention to: time, quality, performance and service, and cost. Time can be measured as the time needed for a product to enter the market, or the time for the delivery of a product or service. Quality in this context is how a product is perceived by the costumer in terms of defects, if the products meet consumers' expectations or not. Performance and service measures are concerned in creating value for the customer.

c. Internal Business Process Perspective

As mentioned before, a firm must have clear objectives to satisfy customers requirements and in this way, increase its profitability. These objectives have to be translated into actions that a firm must carry out internally to accomplish these goals.

A company has to identify activities which employees must excel to ensure improvements in the performance of the firm. There is a relationship between the four perspectives, for example, quality improvements in the internal processes can lead to an improvement in the perception of the customers, they can also lead to costs reductions, improving financial measures (KAPLAN; NORTON, 2001).

Kaplan and Norton (2004) discuss that internal processes can be grouped into four clusters, which are operations management, customer management, innovation and regulatory and social. Operations management involve processes that produce and deliver products or services. Customer management concerns with measures that add customer value. Innovation processes involves the research and development department to create new products or services. Lastly, regulatory and social processes involve measure to establish good relations with external stakeholders.

d. Learning and Growth Perspective

This perspective is focused on actions to continue improvements in a company and to create value. Learning and growth perspective focus on human capital, information capital and organization capital to support the firm's strategy (KAPLAN; NORTON, 2004). Human capital is the availability of skills and talent of the employees that can help to work under the firm's strategy. The category of information capital involves technology and information systems. Organization capital considers organizational climate and quality of work life. These intangible assets must be design specifically to support the company's strategy.

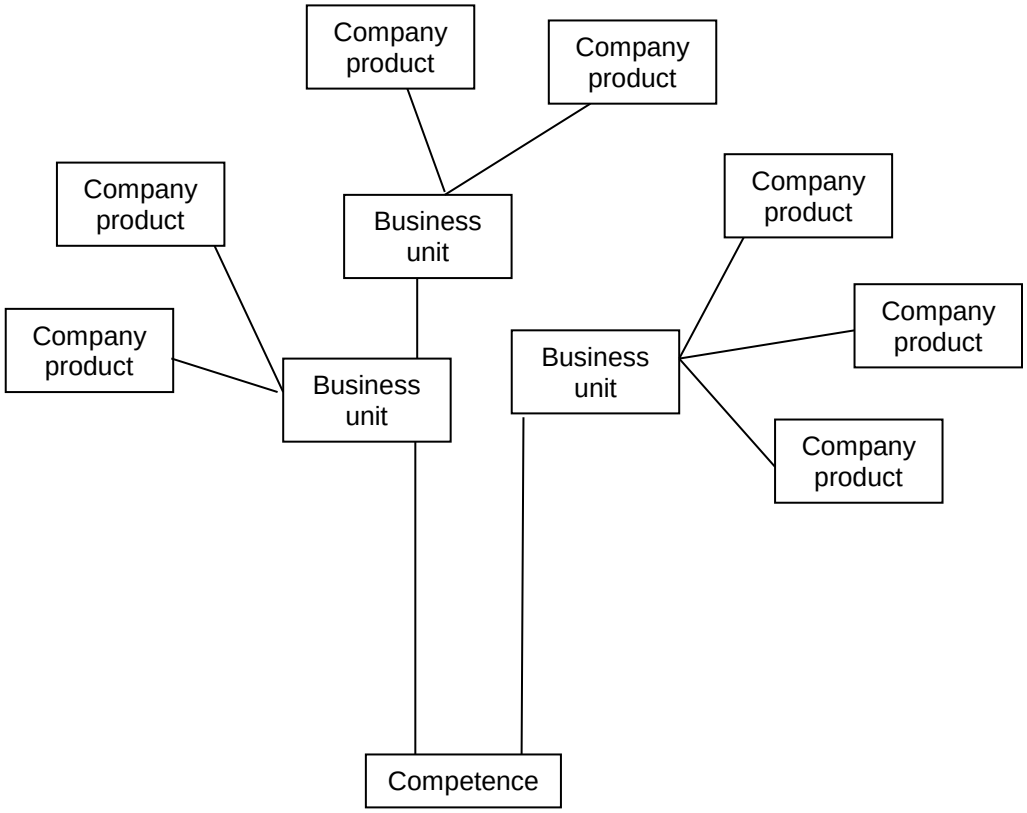
2.2.2 Core Competencies

Another competitive strategy is the Product Core Competencies Matrix from Hamel and Prahalad (1994). Core competencies are defined by Javidan (1998) as a company's strength, something they do very well. According to Prahalad and Hammel (1990), core competencies of a corporation must fulfill three criteria:

a. Provide potential access to a wide variety of markets;
b. Makes a significant contribution in the finished product related to the customer's perception; and
c. It should be difficult to imitate by others.

The authors of this strategy argue that the relationship between the products of a company and its core competences can be described using a tree metaphor. An illustration of the three metaphor is shown in Figure 4. The core competences are the roots of the three, while the products are the leaves. In order to analyze the capability of a firm one must see the big picture, and not focus on specific departments of a firm.

Figure 4. **Core competences as a tree metaphor**



Source: Frynas and Mellahi (2011, p. 120)

Identifying core competences of a corporation can offer different possibilities, for example, help to develop a more efficient use of resources to produce innovations or entry new markets.

Prahalad and Hammel developed a product core competencies matrix, Figure 5, in which they related the existing and new markets to existing and new core competences of the company.

Figure 5. **Product Core Competencies Matrix**

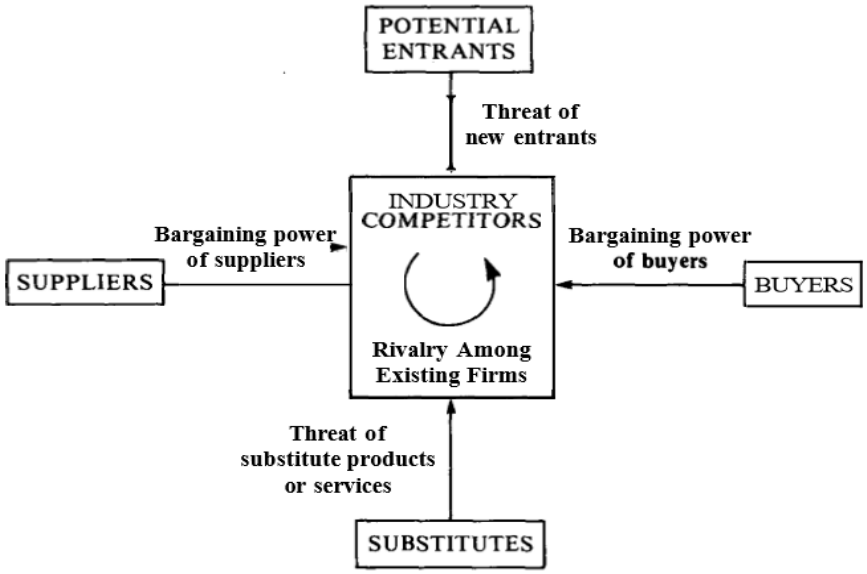
Core Competenc			
	New	**Premier Plus 10**	**Mega-Opportunities**
	Existing	**Fill in the Blanks**	**White Spaces**
		Existing	New
		Market	

Source: Adapted from Hamel and Prahalad (1994)

2.2.3 Porter's Generic Strategies

For a successful formulation of a strategy it is key for a firm to understand its industry structure. Michael Porter (1980) identified five forces of competition, Figure 6, which determine the profitability of an industry. Competition is a term that involves not only the competitors in a specific industry, but also suppliers, buyers, potential entrants and substitute product or services. Identifying the strongest forces in an industry can help to establish the correct strategy for a firm. The strength of each force is different for each industry and this place each firm in a different competitive position.

Figure 6. **Forces Driving Industry Competition**



Source: Porter (1979, p. 141)

Porter (1980) indicates three generic strategies for a firm to defend from the five forces of competition in an industry or to use them in their favor, generating a superior return on investment, these are: cost leadership, differentiation and focus. Figure 7 explains the main differences between these strategies. The following is an explanation more in detail of these strategies.

Figure 7. **Porter's Generic Strategies.**

		STRATEGIC ADVANTAGE	
		Uniqueness Perceived by the Customer	Low Cost Position
STRATEGIC TRAGET	Industrywide	DIFFERENTIATION	OVERALL COST LEADERSHIP
	Particular Segment Only	FOCUS	

Source: Porter (1980, p. 54)

2.2.3.1 Cost Leadership

Cost leadership is attained by a firm by lowering products or services costs but still being able to have positive revenues. With this strategy, a firm must offer lower prices than competitors. Implementing a cost leadership strategy provides a firm from a defense against competitors, additionally, it provides flexibility to the firm in case of cost increases from suppliers. Porter (1980) states that implementing a low-cost strategy can protect a firm from the five forces of competition.

2.2.3.1.1 Cost Management Methods

According to Mijoč, Starčević and Mijoč (2014) the main objective of costs management methods is to reduce the costs involving in the developing and manufacturing of products meeting the requirements and expectations of customers. A firm that fails to reduce costs as rapidly as its competitors will find its profit margins squeezed and its existence threatened (KULMALA; PARANKO; RAUVA, 2002).

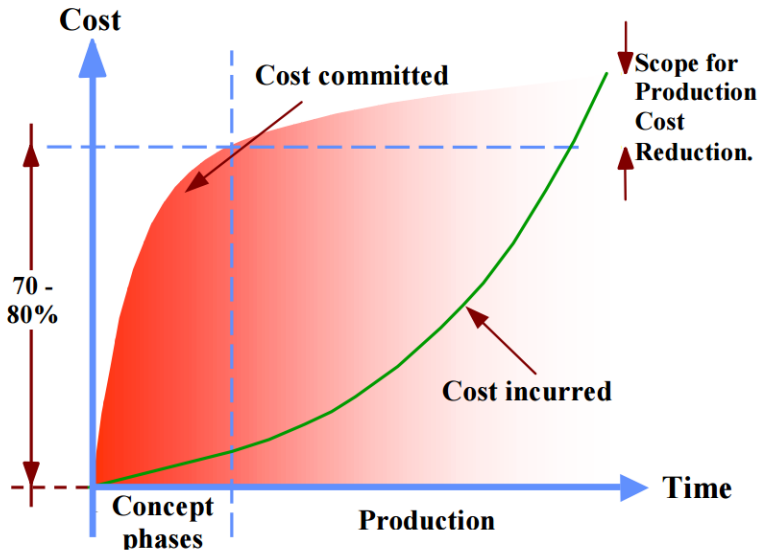
The following are descriptions of well-known costs management methods.

a. Life cycle costing

According to Asiedu and Gu (1998), the approach of life cycle costing can help a firm to compete on the market, reduce costs, increase quality of products and reduce times to bring product onto the market. Researchers found out that 70% of total costs of a product are related in the design phase (DOWLATSHAAHI, 1992; MILEHAM, 1993; ASIEDU; GU, 1998). Figure 8 shows the costs behavior in the product life cycle.

In the life cycle costing method, the cost calculation of a product begins in the early phases and this provides a firm of flexibility to make changes in crucial design decisions.

Figure 8. **Product Life Cycle Committed Costs**



Source: Rush and Roy (2000, p. 2)

b. Target costing

Target costing is a cost management technique that emerged in Japan in the 1960s. According to Sakurai (1989), target costing can be defined as a cost management tool that focus on the entire product life cycle and not on a specific stage for costs reductions, with the help of diverse departments of a firm. Mijoč, Starčević and Mijoč (2014) state that its development was a result of an extremely competitive environment and customers did not accept any price increase.

The target costing process involves a deep market research to know what are the product characteristics that customers are looking for, followed by the planning of the selling price, after establishing a desired target cost it is proceed to the design and engineering of the product or service. The fact that the price of the product is established before the design forces employees from different departments and suppliers to negotiate tradeoffs in order to reach the target cost. This methodology helps to reduce costs in the entire life cycle of the product or service. Target costing is more beneficial than traditional methods because in the traditional approach a

company waited to establish a price cost until the last stage of the product life cycle and by this time almost all costs are already fixed, giving the company little ability to modify costs (FEIL; YOOK; KIM, 2004). This cost management method focuses on the maximization of long term profit.

c. ABC method

According to Kaplan and Cooper (1988), firms using traditional cost management methods use to wrongly consider a large proportion of manufacturing costs as fixed costs, the majority of this costs vary with the complexity of the production and not with the volume. Activity-Based costing is a method for calculating the costs of a product based on the realized activities to manufacture the product, analyzing the complete life cycle of a product or service. The ABC method distributes the overhead costs in proportion to the activities performed on the finalized product, considering activities from all the department involved, like marketing, R&D, overhead support, etc. (NIAZI et al., 2006). Traditional methods, usually, consider only material and labor costs, but overhead costs are traced to specific departments, like production, and not directly to the final product or service.

The process of this methodology is the following (BEN-EN-ARIEH; QIAN, 2003):

1. Identify the resources used in a product.
2. Identify overall costs associated with these resources.
3. Find the costs drivers: number of units produces, labor hours, number of orders received, etc.
4. Identify the activities realized in the process.
5. Calculate the costs of these activities.
6. Identify activities costs drivers and calculate their values.
7. Calculate overall costs.

This method also helps a firm to identify activities that add no value to the products and that costumers are not willing to pay for them, and by eliminating them the firm improves its performance (MIJOC; STARCEVIC; MIJOC, 2014). Not all activities that do not add value to a product can be eliminated, but it helps the firm to focus on the activities that increase the company's profit.

d. Benchmarking

Benchmarking is a method in which the best practices in an industry are identified and tried to be followed. By doing this, a firm can reduce costs in different areas and improve its performance. This method is cost beneficial because a firm tries to avoid mistakes that other companies have already made (DRURY, 2005). Benchmarking is not about copying and imitating processes form others, it is more about learning from the best and trying to adapt strategies under different circumstances.

There are different types of benchmarking, the most popular are internal and external benchmarking (BARBER, 2004). Internal benchmarking is when a firm compare the practices from its own different departments in order to find the best ones. External benchmarking is comparing a firm to other organizations which are considered the best. Both types are beneficial for the performance of a firm.

2.2.3.2 Differentiation

The second generic strategy is about product or service differentiation. The strategy of differentiation can be understood as a way for firms to be perceived as unique by customers, this strategy also helps the firm to acquire a better competitive position in the market. By implementing this strategy costs must not be ignored, but they are not the principal aspect of focus. Performed activities to differentiate a product are usually expensive, but customers are willing to pay for this if they perceive the product or service as unique. A main advantage of implementing a differentiation strategy is that is increases the loyalty of customers as they perceive

the product as different and of high quality. However, there are also disadvantages, the costs generated can be high and sometimes customer could not be willing to pay for this, also the differentiated characteristic could be imitated by competitors, reducing market share for the firm. Differentiation strategies can be divided in two classes: brand and product differentiation.

a. Brand Differentiation

The strategy of brand differentiation is about focusing on improving extrinsic characteristics, such as marketing and packaging. Focusing on brand differentiation situate the brand in a better competitive position, making it more difficult for the entry of substitutes and turning consumers of the brand more loyal (ROMANIUK; SHARP; EHRENBERG, 2007). This strategy requires investment in publicity, distribution channels, and marketing.

All marketing strategies are composed by four main aspects, which are product, price, promotion and place (BORDEN, 1964). As mentioned before, extrinsic characteristics are considered in this strategy. In the aspect of the product is focused on the package, the brand and the social image of it. The package communicates the characteristics of the product to consumers, it is a way of attracting more buyers. The brand is the name under which the product is sold, consumers must identify this name as the best of all in the market. Price strategies are for examples giving payment facilities to customers. The aspect of promotion is basically publicity and sales force, both involve a strong relationship with costumers to make them perceive the unique characteristics of the product. Lastly, the place aspect is the way in which the product is delivered to customers, distribution channels.

b. Product Differentiation

On the other hand, product differentiation focuses on the intrinsic characteristics of a product or service, for example product innovation, quality and

product design. This strategy generates elevated costs of research and development and quality implementations.

There are two types of innovations, which are total or incremental innovation (DEWAR; DUTTON, 1986). Total innovations involve the develop of new products or services, while incremental innovations consist on the improvement of existing products on the market. The advantage of radical innovations is that when the product is being launched it will have no competitors, but they require high investments on research and development. Incremental innovations are benefited from research already done, and in this way, firms implementing this strategy have costs reductions in this aspect, but have more competition in the market.

Differentiation based on quality is related with the design of the product and technical characteristics. This strategy can be focused on the product and on the customer. Based on the customer some strategies are technical service and compliance with delivery dates.

2.2.3.3 Focus

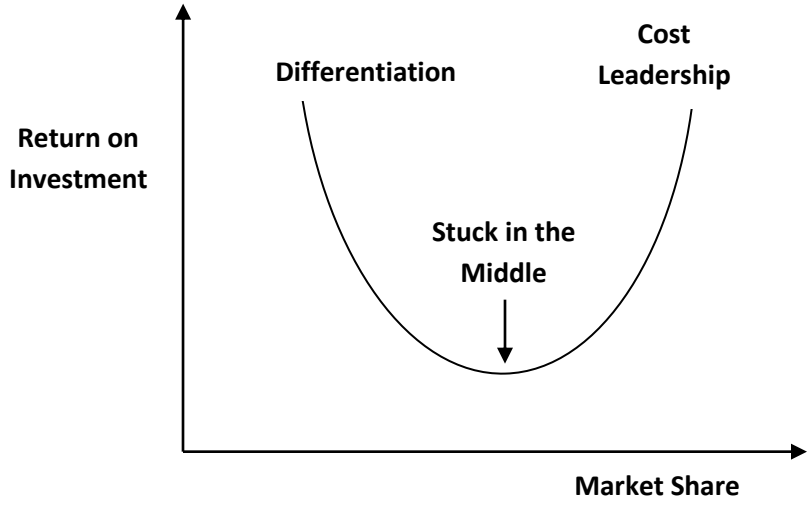
The last generic strategy is about focusing on a specific market or product line segment, by implementing this strategy, a company can achieve differentiation or lower costs, or both. While low cost and differentiation strategies are implemented to achieve objectives industrywide, focus strategies serve a particular target.

A niche market strategy is when a firm identifies the needs of a specific market and creates a product for it, or first developing a product and them finding a specific market for it. Parrish, Cassill and Oxenham (2006) argue that in the implementation of a focus strategy, a firm needs to concentrate on the consumers. A firm can also focus on lowering costs to satisfy the needs of a specific market segment, and this could also help to defend against competitors.

2.2.3.4 Stuck in the Middle

According to Porter (1980) a firm that fails to choose between the three generic strategies: cost leadership, differentiation and focus, is said to be “stuck in the middle”, or in an extremely poor strategic situation. In Figure 9, it is observed that the position “stuck in the middle” has a low return on investment and low market share. This usually happens with companies that try to be differentiated and also offer low costs. Given the potential inconsistencies involved in pursuing these three strategies, such an approach is almost always doomed to failure (PORTER, 1980).

Figure 9. ***Stuck in the Middle*** **Concept**



Source: Porter (1980, p. 72)

In another perspective, the author Weise (2005) arguments that “stuck in the middle” could be a positive strategy, by combining the advantages of two strategies the cooperative’s goal could be achieved.

2.3 Existing Models for the Evaluation of Alliances

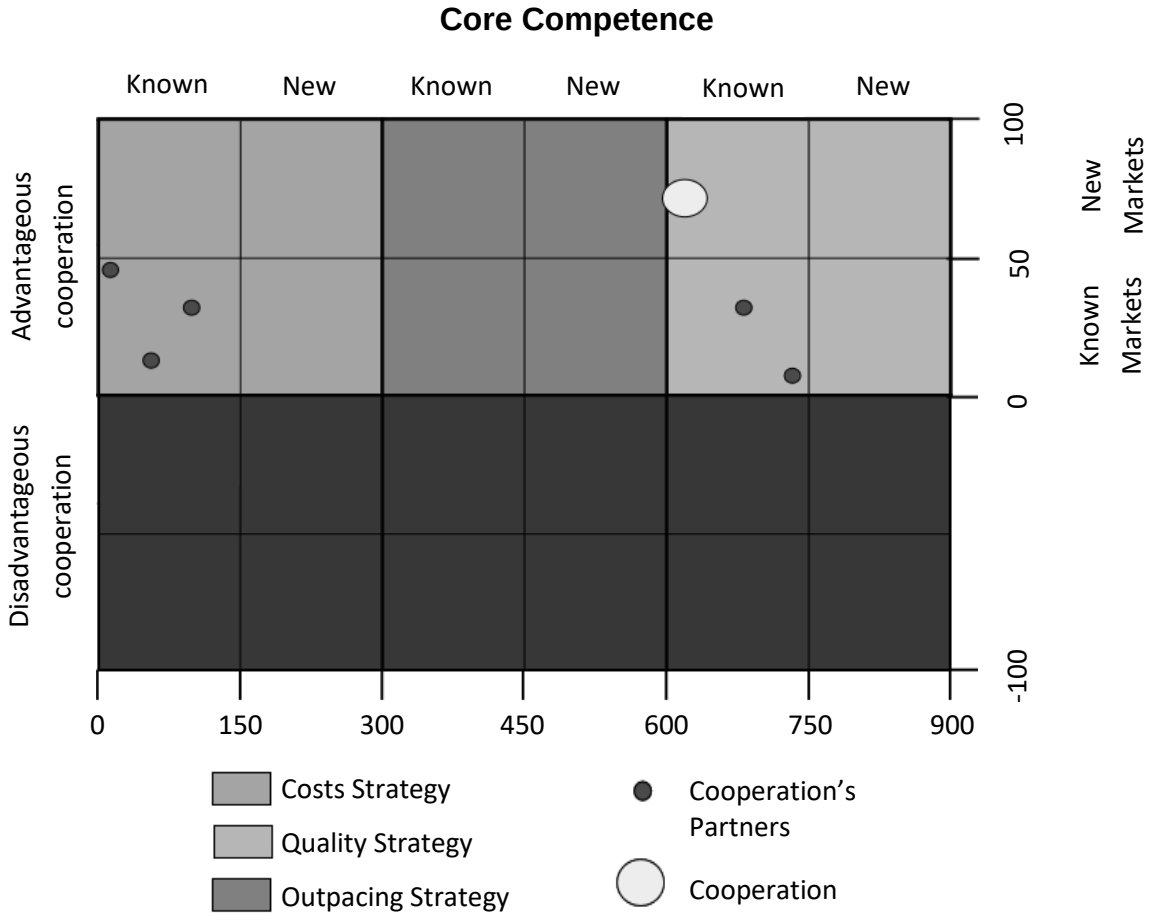
In this topic, two models that evaluate networks cooperation performance are described, analyzed and compared. There are few models in the literature that help to evaluate the performance of a partnership and of each firm that makes part of the alliance individually. The Weise Model (2005) and Petter Model (2012), both are based on the analysis of each company's competences, expressing their results in a matrix that show the position of the alliance, as well as of each firm inside the alliance individually.

2.3.1 Weise Model

It exists a business management model named Weise Model (2005), which function is to analyze the success of alliances and business networks and classify the business strategy followed by the cooperation. This model is based on three well known business strategies: Porter's Generic Competitive Strategies (1980), Core Competences from Prahalad and Hammel (1990) and Balance Scorecard from Kaplan and Norton (1996).

The author Weise (2005) propose in his model the use of three competitive strategies from Porter (1980): costs, quality and outpacing. At the same time the author applies the concept of core competence from Prahalad and Hammel (1990) by dividing the matrix in known and new markets, as well as in known and new core competences (WEISE et al., 2009). This model also includes the methodology of Balanced Scorecard from Kaplan and Norton (1996) by using a system of scores in two different axes. The Weise Matrix of Cooperation is shown in Figure 10.

Figure 10. **Weise Matrix of Cooperation**



Source: Adapted from Weise (2009)

This model was developed based on a strategic alliance composed of five companies in the Facility Management (FM) market, so it is a very specific model that cannot be easily applied in different industries. The FM alliance is focused on solving issues that involve building and property management, by implementing technology and IT tools. In Figure 9 is shown the position of each company in the cooperation, as well as the position of the cooperation itself. The performance of strategic alliances must be analyzed in terms of the alliance itself and of each of the partners entering the alliance (GULATI, 1998). According to Weise (2011) if one partner of the alliance is in a disadvantageous position in the cooperation, then the whole cooperation is impracticable.

For the application of the model data collection was carried out. A questionnaire was applied to all partners of the alliance, involving cooperation and individual factors to gather information about each company's strategy and the individual situation of every partner in the alliance. Table 1 presents the evaluated factors in the questionnaires.

As mentioned before, this model was implemented in an alliance of facility management, being this a vertical alliance due to the different activities realized by each partner. The model was not implemented in other types of cooperations, so it cannot be stated that it is applicable for horizontal cooperations.

One of the advantages of this model is that it can help to compare individual strategies, making it possible to correct inconsistencies in strategies among the partners of the alliance that could be detrimental for the cooperation. This model can be used before the establishment of a cooperation, reducing the risks of failure by aligning business strategies from the different partners in order to potentialize the development of the cooperation.

Table 1. **Evaluated Factors in Weise Model**

Individual Factors	**Cooperation's Factors**
Average of services and products innovations	Importance of cooperation objectives for its company
Company strategy	Purchases in set
Costs strategy	Research and Development in set
Quality strategy	Interface development in set
Costs and Niche Strategy	Sales in set
Quality and Niche Strategy	Use of the synergic effect
Dialogs with the collaborates	Risk reduction
Collaborates Satisfaction	Entrance on the Market
Average volume of the sales/staff/year and perceptual	Knowledge gain
Average growth of the staff board by year and percentage	Cooperation Strategy
Number of apprentices, trainee, graduated, persons that have master's degree, etc.	Costs Strategy
Number of training and professional education continued along the year	Quality Strategy
Number of new orders in the last year	Costs and Niche Strategy

Number of new orders in the present year	Quality and Niche Strategy
Planning of the sales volume growth in the present year in percentage	Number of waited projects weeks
Growth of licenses and patents in the present year in percentage	Average duration of the projects in weeks
Frequency of the client's fidelity in the year	Sales volume of the company through the cooperation
Quota of high qualified staff in percentage	Number of cooperations where the company is partner
Number of projects of researches and of development in the present year in percentage	
Average duration of projects in weeks	

Source: Weise (2011, p. 85)

The Facility Management Alliance, where this model was tested, was established in the year of 2004.

2.3.2 Petter Model

The main objective of the Petter Model (2012) is to analyze the level of coopetition among the partners of horizontal alliances. The concept of coopetition involves the simultaneous cooperation and competition between firms (BENGTSSON; KOCK, 2000).

Based on a literature review in the newspaper portal CAPES from the years of 2008 to 2011, Rodolfo Petter (2012) in his model proposes 18 KSF and 46 variables, presented in Table 2, for the construction of the model.

Table 2. **Evaluated factors in Petter model**

Dimension	**KSF**	**Variable**
Cooperation	1. Trust and Commitment	Level of interaction between the network
		Affinity between the partners
		Cooperation between the partners

	2. Complementary and reciprocity (Sinergy)	Cooperative relationship between the partners in relation to complementarity and reciprocity
		Invested efforts of each partner
		Increased stability
		Removal of obstacles, restrictions and limitations
		Results of the cooperation over a time period
	3. Knowledge and Experiences Exchange	Internal network cohesion
		Collective learning
		Stimulation for the generation and diffusion of knowledge
	4. History and Identity	History before the alliance
		Cultural alignment
	5. Sharing and Equity	Equity of rights and obligations
		Goals in common
		Interdependence among partners
	6. Conflicts and Incompatibilities Management	Incompatibilities management among partners
		Conflict management in the network
		Ability to manage different expectations and interest from partners in relation to the cooperation
	7. Competitive cooperation	Sharing of competitive tools among partners
		Administration and control of opportunistic attitudes

		Control of rivalry actions
	8. Control and Standardization	Mechanisms of management and control
		Diversity of partners and structure standardization
	9. Adaptability and Alignment	Adaptation and mobilization capacity
		Strategic alignment
	10. Interdependency and Heteronomy	Independence of the firms in the management of the business
	11. Governance	Governance formalization
		Management of external links to the network
	12. Externalities	Infrastructure for cooperation
		Proximity among partners
Competences	13. Strategy and Management	Power of the firm to identify its weaknesses
		Potential to translate core competences into competitive advantages
		Financial Planning
		Ability for strategic benchmarking development
	14. Productive Competence	Standardization of production management
		Technology implementation in production
		Production Capacity
	15. Innovative Competence	Ability to innovate and respond to market demands

	16. Financial Resources	Availability of working capital
		Control degree of indebtedness
		Costs
	17. People Management	Manpower training
		Commitment to the company´s human resources
	18. Intangible Resources	Reputation of the company and its brand
		Intellectual capital management

Source: Adapted from (Petter, 2012)

These factors can be also divided in the four different areas of the balanced scorecard, which are: financial, strategic, operational and relationships.

The author utilizes a decision-making method named Analytic Hierarchy Process (AHP), to attribute numerical values to each KSF according to its importance. The AHP method involves a multivariate analysis that helps reduce the randomness of subjective evaluations (GAUDENZI; BORGHESI, 2006). This method makes pairwise comparisons and transform these comparisons into weights and scores that can be used for different purposes, in the case of this model they are used to identify which factor is more important for the purpose of a specific alliance. A questionnaire was developed by the author to be answered by the person responsible for the alliance, a person with all the required information to make valuable judgments. An example of an applied questionnaire for the weighting of these factors is presented in Table 3.

Table 3. **Structural model for the weighting of KSF**

Dimension	***Primary KSF***	***Priority scale***	***KSF of Comparison***

Cooperation	Trust and Commitment	9 7 5 3 1 3 5 7 9	Complementary and reciprocity (Sinergy)
	Trust and Commitment	9 7 5 3 1 3 5 7 9	Knowledge and Experiences Exchange
	Trust and Commitment	9 7 5 3 1 3 5 7 9	History and Identity
	Trust and Commitment	9 7 5 3 1 3 5 7 9	Sharing and Equity
	Trust and Commitment	9 7 5 3 1 3 5 7 9	Conflicts and Incompatibilities Management
	Trust and Commitment	9 7 5 3 1 3 5 7 9	Competitive cooperation
	Trust and Commitment	9 7 5 3 1 3 5 7 9	Control and Standardization
	Trust and Commitment	9 7 5 3 1 3 5 7 9	Adaptability and Alignment
	Trust and Commitment	9 7 5 3 1 3 5 7 9	Interdependency and Heteronomy
	Trust and Commitment	9 7 5 3 1 3 5 7 9	Governance
	Trust and Commitment	9 7 5 3 1 3 5 7 9	Externalities
...			

Source: Petter (2012)

As the method of Analytic Hierarchy Process is not the focus of this master thesis, it will not be deeply explained.

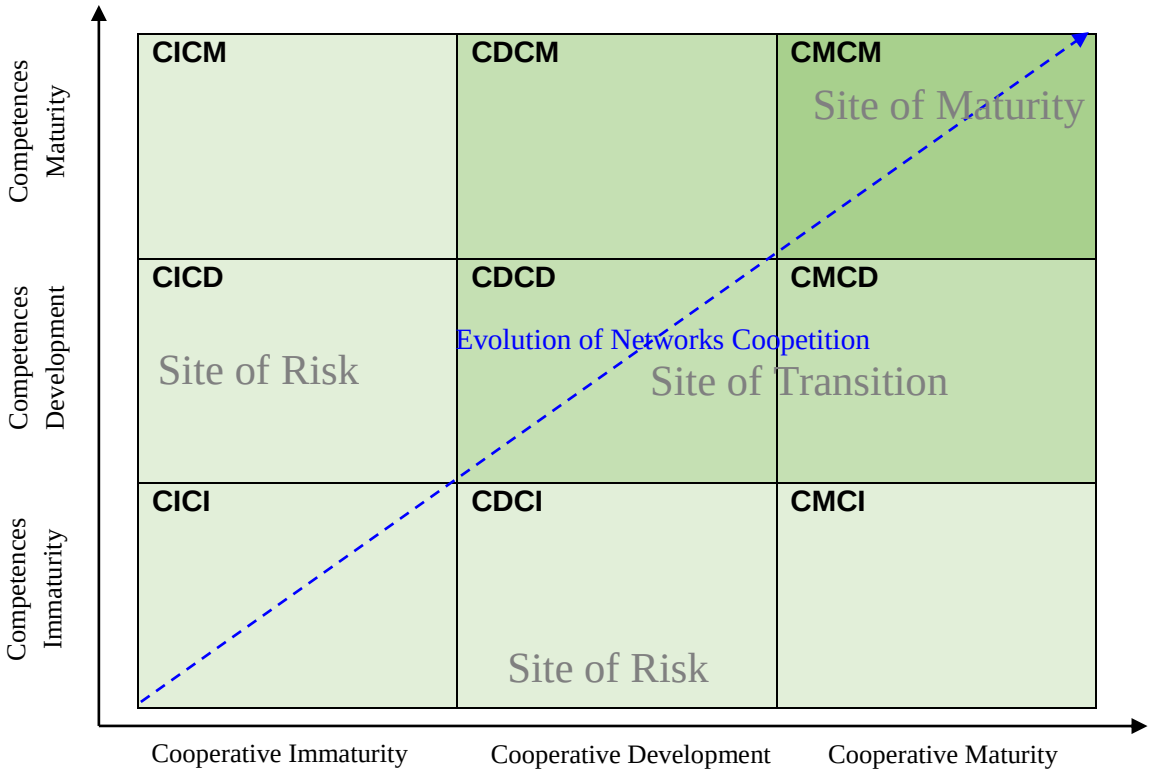
For the construction of the model data collection is also carried out, which involves a questionnaire regarding the variables exposed in Table 2. This questionnaire involves actions that can be executed or not by the company, and the user has two options as an answer, “yes”, if the company executes the action, or “no”, if it does not. Each variable is composed by a different number of indicators and they were proposed thorough brainstorming by a group of specialists and researchers linked to the Research group of on Organizational Engineering and Business Networks – EORE, its initials in Portuguese (PETTER, 2012). The information gathered from these questionnaires is transformed into coordinates that are situated in a diagram of cooperation. The Petter Model is shown in Figure 11.

The Diagram of Cooperation presents three main cooperation’s situations, being them: site of risk, site of transition and site of maturity.

The cooperations situated in the site of risk present low coopetitive performance, requiring great adjustments and strategic realignment of the cooperation. This could also mean that partners present or they present differences

between cooperation and internal competencies objectives. A cooperation situated in a site of transition indicates the beginning of the generation of results through coopetition, with the evolution of the levels of competitiveness of the network through coopetition. There are still flaws in the cooperation that could be improved. Lastly, firms situated in the region of maturity present high coopetitive performance, with mature and complex actions both of interrelationship and of internal competences. Actions for the maintenance and control of the cooperation should be implemented.

Figure 11. **Petter Matrix of Cooperation and Competences**



Adapted from: Petter (2012)

The Petter Model (2012) present a matrix which classifies the situation of the alliance in nine different maturity positions, they are defined as followed:

a. *CICI – Cooperative Immaturity and Competences Immaturity*: This level is characterized by high mortality rate for the cooperation and also for the firms

in this level. Cooperation between the partners is almost non-existent, making the performance of the cooperation inefficient.

b. *CDCI – Cooperative Development and Competences Immaturity:* This level indicates certain complexity in the cooperative actions of firms, causing low performance of their competences. Firms should get support from partners to accelerate its competences development.

c. *CMCI – Cooperative Maturity and Competences Immaturity:* This level is characterized by the strength of the cooperation between firms, that creates competitive benefits for the alliance and for each partner. However, the competences development of the firms is not optimal, which slows the evolution of the cooperation.

d. *CICD – Cooperative Immaturity and Competences Development:* This level presents risks, even when there is certain development of competences. There is a need for stronger cooperative actions.

e. *CICM – Cooperative Immaturity and Competences Maturity*: This level is characterized by highly competitive firms, but with low level of cooperation. This could indicate the possible end of the cooperation.

f. *CDCD – Cooperative Development and Competences Development:* In this level, the risk mortality is lower. In this level is when it is needed a lot of effort and commitment from the partners to contribute for the cooperation's success.

g. *CMCD – Cooperative Maturity and Competences Development:* This level indicates that firms can potentialize the competences development by the execution of technical information with the help of the partners. The high level of cooperation should be used as advantage for competences development.

h. *CDCM – Cooperative Development and Competences Maturity:* Firms in this level are highly competitive, with high capacities. Cooperative actions should be the focus in this level.

i. *CMCM – Cooperative Maturity and Competences Maturity:* This is the highest level to obtain. It indicates a self-sufficiency state of the cooperation. In this level actions for the consolidation of the cooperation should be the focus.

2.3.3 Comparison between the two models

Both models provide information of the analysis of a cooperation, analyzing the cooperation itself and each individual partner. However, they present clear differences in the basic structure of the models and the scope and flexibility of application. The strengths and weaknesses of each model are presented in Table 4.

Table 4. **Strengths and Weaknesses of Weise and Petter Models**

	Strengths	**Weaknesses**
Weise Model	-Evaluation of the cooperation and of each partner individually; -Provides information about business strategies for a better analysis; -Analyses core competences of each firm and the possibility to entry new markets; -Strong bases of literature sources; -Easy to implement.	-Very specific model; -Not flexible for changes in the structure of the model; -Has not been implemented in other cooperations.
Petter Model	-Evaluation of the cooperation and of each partner individually; -Flexible for alterations in the structure of the model; -Generic model for different industries.	-Not so easy to implement; -Elaborated exclusively for horizontal cooperations; -Has not been implemented in other industries.

Source: Elaborated by the author

The main problem of these two models is that they were elaborated for a specific industry, in the case of the Weise model, and for a specific type of

cooperation, in the case of the Petter model. The before mentioned motivated this work for the development of a generic model that includes the advantages of the both models in study.

3 METHODOLOGY

In this chapter, the methodologic procedures implemented in this master thesis are presented. The research study is divided in four main steps, the first one includes the analysis of existing models in the literature used to evaluate the performance of strategic alliances. The second step involves the development of a new model that includes the main advantages of the previously analyzed existing models. Then, the third step is the implementation of a questionnaire in companies within a network, with the objective of obtaining data for the model to evaluate the network's performance. Finally, the fourth step is to analyze the data obtained using the developed model and provide the network's governance with a detailed diagnosis of the performance of the strategic alliance.

3.1 Research Classification

The main problem identified emerged from a literature review. As for the nature, the research can be classified as bibliographical, as it is developed from material already elaborated, consisting mainly of books and scientific articles. The research can also be classified as an exploratory research, whose objective is to provide a greater familiarity with the problem, with aims to turn it more explicit and to construct a hypothesis. With respect to the adopted procedure, it is also possible to classify this work as a field research, which is characterized by the deep and exhaustive study of one or a few objects, in a way that allows its broad and detailed knowledge.

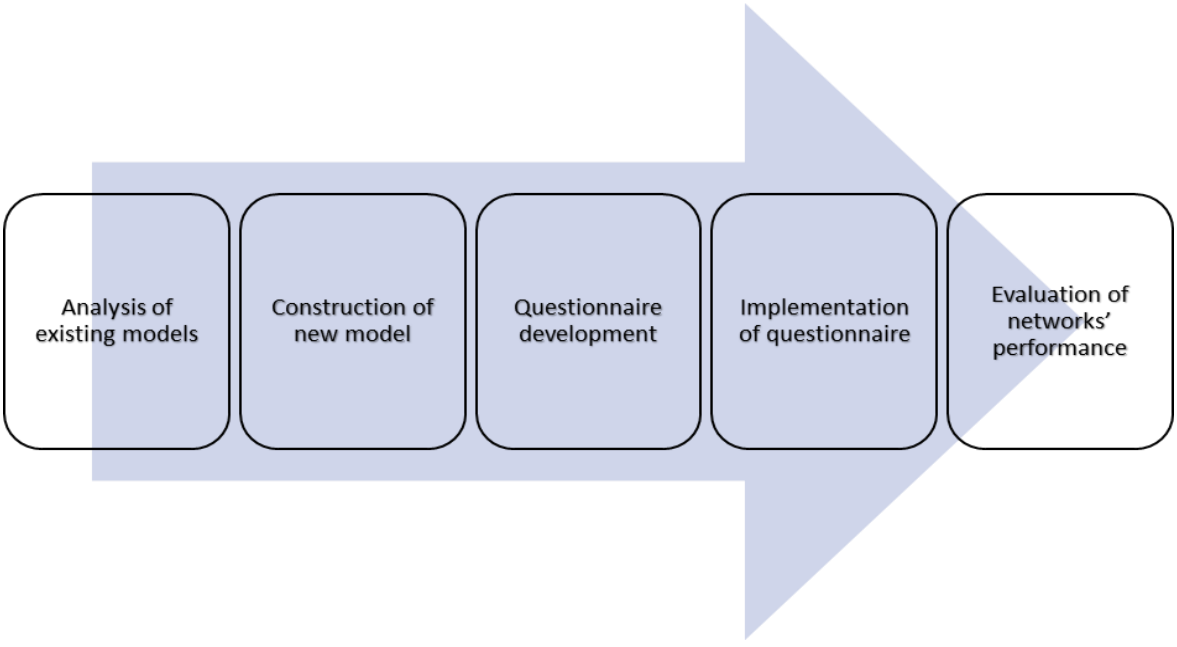
According to the objectives of this master thesis, the work can be classified as empirical, as it is needed its implementation to prove its applicability. Gerhardt and Silveira (2009) define an empirical work as one that requires practical prove through data collection.

3.2 Research Design

The first step of this master thesis is to carry out an extensive literature review about main concepts involving strategic alliances. Following, main models that evaluate the performance of strategic alliances and of each partner within the network individually will be analyzed. Strengths and weaknesses of these models have to be identified in order to develop an improved model. For the implementation of the model in the industry, data collection must be carried out in the form of questionnaires to specific strategic alliances, to gather information about internal competences and strategies of each company individually, as well as of cooperation factors to analyze the benefits that the cooperation has brought to the firms. This could also help the users to identify how firms can improve the network's performance. The study's development process is shown in Figure 12.

In order to prove the applicability of the model, and as the elaborated model is intended to be generic, it will be implemented in two different types of strategic alliances.

Figure 12. **Study development process**



Source: Elaborated by the author

3.3 Data collection Techniques

For this research, the technique used for data collection was the implementation of questionnaires. This questionnaire includes closed ended questions, this makes it easier for the used to complete it in less time. The questions are about how the owners or managers (or the person who answers the questionnaire) perceive certain situations in the company. As the questionnaire collects data involving the attitude of the user it was decided to incorporate a Likert-scale. The Likert scale is an essential tool in psychology and in social surveys, and is a ubiquitous method of collecting attitudinal data (DITTRICH et al., 2005).

The questionnaire was divided in two different categories, in order to give a deeper analysis of the information. One division is based on the balanced scored factors and the second division is based on factors of cooperation and individual competences. The complete questionnaire can be found on Appendix 2.

Using this methodology, it was possible to create a new model to evaluate strategic alliances performance and the results are presented in the next chapter.

3.4 Research Limitations

One of the main limitations of this research is the response rate of the questionnaires applied to the companies being part of a strategic alliance. It is understandable that it is difficult for small and medium companies to invest time in bureaucratic issues. The fact that in order to implement the new model it is required to answer a specific questionnaire, makes it difficult to ensure a 100% commitment from the companies involved. For the success on the implementation of the 3D model it is key to try to reduce as much as possible the number of questions and to redact them as objective as possible.

4 3D MODEL

In this section, the hybrid model that was developed through the analysis of the main advantages of the models Weise (2005) and Petter (2012) is presented.

Both models, Weise (2005) and Petter (2012), evaluate the performance of strategic alliances, but as mentioned in section 2.3.3, the models have their own advantages and disadvantages. For the development of a new model, the advantages of both models were analyzed and brought together in one single model. In Table 5 are presented the factors and variables that were considered for the evaluation of the performance of strategic alliances in the new developed 3D model. This new model intends to fuse both models that were previously analyzed and to make the application process easier and faster. The Petter model (2012) uses a questionnaire with 144 indicators and it takes about half an hour for the companies to answer it. This is, most of the time, difficult for the companies' owners or managers to find the time for this type of exercises. On the other hand, being one of its advantages, the questionnaire used in the Weise model (2005) is made up of 17 indicators, making its implementation easy and fast. The 3D model uses a questionnaire with 99 questions, presented in Appendix 2. The time required for the filling of this questionnaire is about 15 minutes. These indicators can be modified or substituted to adapt better to a certain industry.

For a better analysis of the performance of strategic alliances, these variables are divided into two different categories. The first category is based on the four factors of the balanced scorecard: financial, strategic, operational and learning and growth. The second category is based on cooperation factors and factors of individual competences. The 3D model presents the results in two different ways using both divisions for a deeper analysis. The variables and indicators were adapted from the two analyzed models.

Table 5. **Key Success Factors in the 3D Model**

KSF1	***KSF2***	***VARIABLE***
Financial	**Competences**	Availability of working capital

		Control of degree of indebtedness
		Costs
		Financial planning
Strategic	**Strategy**	Identification of the method of reducing costs as a competitive strategy adopted by the company
		Identification of the method of quality focus as a competitive strategy adopted by the company
		Identification of the mixed method of cost reduction and increase in quality as a competitive strategy adopted by the company (outpacing)
	Cooperation	Mutual dependence among associated companies
		Capacity of adaptation and mobilization
		Strategic alignment
		Results through cooperation over time
	Competences	Company and brand reputation
		Management of intellectual capital
		Ability of the company to identify its weaknesses
		Ability to develop strategic benchmarking
		Ability to innovate and respond to market demands
Operational		Training of employees
		Human resources in the company
		Formalization of production management
		Technological qualification of production
		Production capacity
Learning and Growth	**Cooperation**	Management and control mechanisms
		Diversity of partners and Standardization of Structure (affinity)
		Infrastructure for the network's companies
		Proximity between the network's companies
		Level of interaction and communication between the network's companies
		Affinity between the companies of the network
		Invested efforts by each of the network's companies
		Increased stability
		Removal of obstacles, constraints and limitations
		Equity of rights and duties
		Management of incompatibilities between partner companies
		Network's internal conflict management
		Ability to manage different expectations and

		interests from the companies in terms of the network
		Governance formalization and the relationship between the companies from the network

Source: Adapted from Petter (2012) and Weise (2005)

Unlike the Petter Model (2012), the Analytic Hierarchy Process method was not implemented for the construction of the 3D model. In order to reduce times of application of the developed 3D model, the considered key success factors for this model were given the same importance, in this way it is not necessary to apply an extra questionnaire for the weighting of the factors. The model is very dynamic, it can be implemented in different business sectors, by modifying the indicators and variables of the questionnaire. The variables and indicators can be modified to adapt better to a specific sector, they can be removed, modified or substituted and this does not affect the results. This can be done by the person who implements the model, after a deep research of the strategic alliance in matter.

The questionnaire used for the evaluation of the performance of a strategic alliance using the 3D model, must be implemented in each company within the network in matter to obtain data that will be translated into a diagnostic of the network's performance. An example of the questionnaire applied for the evaluation of strategic alliances is presented in Table 6 and the complete questionnaire is presented in Appendix 2. To provide the user with a more exact analysis, the questionnaire allows the user to evaluate each indicator using the Likert-scale including five different numbers, being 1 "strongly disagree", 2 "disagree", 3 "neutral", 4 "agree" and 5 "strongly agree". Some of the advantages of Likert-scale questionnaires is that data can be gathered relatively quickly from large numbers of respondents and they can provide highly reliable person ability estimates (BEGLAR; NEMOTO, 2014). This type of scale provides the user with a wider range of options to make a more exact decision.

Table 6. **Structural model of the questionnaire for the evaluation of alliance's performance**

KSF1	***KSF2***	***VARIABLE***	***INDICATOR***	***ANSWER***				
Financial	**Competences**	Availability of working capital	1. The company has clear knowledge of the working capital required for its operations.	-1	2	3	4	5+
			2. The company is able to maintain the required working capital for its operations, without the need to borrow, finance, etc.	-1	2	3	4	5+
		Control of degree of indebtedness	3. The company has control over its degree of indebtedness, not being this a management difficulty.	-1	2	3	4	5+
			4. Loans are requested in a planned and calculated manner and never in an emergency.	-1	2	3	4	5+

Source: Adapted from Petter (2012)

This questionnaire must be answered by all the members of the strategic alliance that is being analyzed or at least the most representative ones, to provide a more exact result.

The proposed model was designed using the software MATLAB, because it allows the user to create three dimensional models. The 3D model is presented in Figure 13. On one side of the model, cooperation factors versus individual competences factors are plotted. This helps the user to identify the level of maturity of the company in the cooperation and on its individual competences as well. It has

three different zones being them: site of risk, site of transition and site of maturity. In this part of the model each quadrant represents a specific status for each company within the network and for the cooperation, as mentioned in the review of the Petter model (2012), these are:

a. *CICI – Cooperative Immaturity and Competences Immaturity*;

b. *CDCI – Cooperative Development and Competences Immaturity*;

c. *CMCI – Cooperative Maturity and Competences Immaturity*;

d. *CICD – Cooperative Immaturity and Competences Development*;

e. *CICM – Cooperative Immaturity and Competences Maturity*;

f. *CDCD – Cooperative Development and Competences Development*;

g. *CMCD – Cooperative Maturity and Competences Development;*

h. *CDCM – Cooperative Development and Competences Maturity; and*

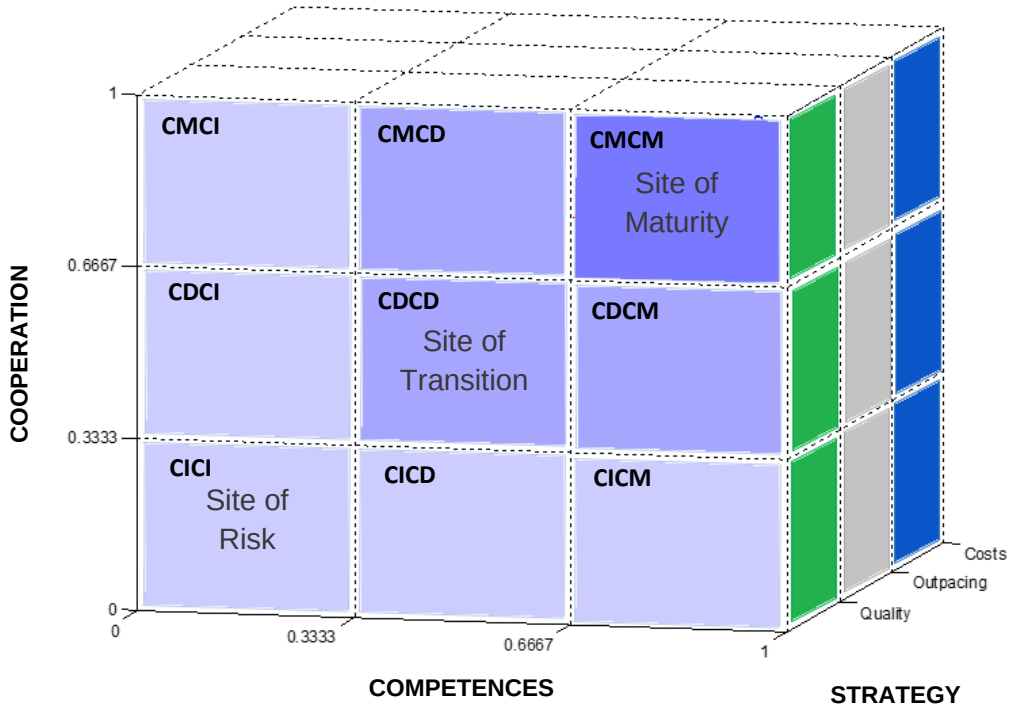
i. *CMCM – Cooperative Maturity and Competences Maturity.*

The format of this side of the 3D model is very much alike with the Petter model (2012), the only thing that changes is the questionnaire applied to obtain the data that goes into the model, which uses a Likert-scale and has fewer questions. This model is a 3D model because it used 3 axes, X representing individual factors, Y representing cooperation factors and Z representing strategy factors.

On the other side of the model, strategy factors are plotted versus cooperation factors. This part of the model was inspired in the Weise model (2005), it helps the user identify which strategy is being followed by the company and by the cooperation itself, so they can focus on specific factors to obtain better results. The three main strategies discussed in the model are based on the competitive strategies from Porter (1980), quality, outpacing and costs strategy. As mentioned in the literature review,

the strategy of outpacing is often seen as a strategy that puts together the advantages of both, quality and costs strategies.

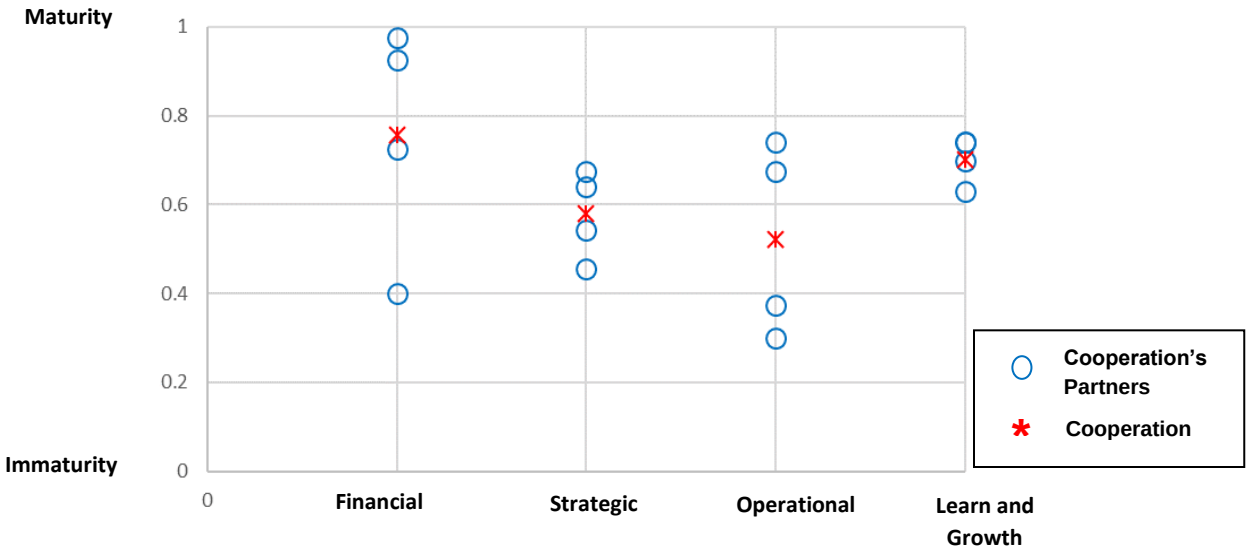
Figure 13. **3D Model for the Analysis of Strategic Alliances**



Source: Elaborated by the author

The factors and indicators in the questionnaire are subdivided in two different categories, one of them being balanced scorecard factors and the other cooperation and individual competences factors. The 3D model previously presented, shows the results using the category of cooperation and individual competences factors. In order to provide a deeper analysis, the second category of balanced scorecard factors is used to present the results. These results are shown in Figure 14. The questionnaire used to obtain the data has the exact same questions as in the previous representation of results, the questions are just rearranged.

Figure 14. **Balanced Scorecard Factors Evaluation**



Source: Elaborated by the author

Figure 14 shows an example of the presentation of the results having as a base the category of balanced scorecard factors. This representation of the data is helpful for the users as it allows them to identify specifically in which sector they must pay special attention to improve the performance of their company and at the same time the performance of the cooperation.

5 IMPLEMENTATION OF THE 3D MODEL

The 3D model was applied in two different strategic alliances from the city of Santa Maria in Brazil, shown in Figure 15. The evaluations of the performance of these two strategic alliances are presented in this section.

Figure 15. **Map of Santa Maria, RS**

Source: Adapted from AboutBrasil (2017)

5.1 Application of the Model in the “APL - Metal Centro” Network

The APL – Metal Centro (Local Productive Arrangement) is a cluster of companies that work in the metallurgic industry. According to Da Cruz et al. (2014), in the year of 2008 a group of entrepreneurs started gathering to discuss topics of common interest regarding the metallurgic industry and in the year of 2013, they accomplished to create the association known today as APL – Metal Centro. This association has the intention to obtain different kinds of benefits, for example entering new markets, networking, technological and productive innovations, among

others. Nowadays, this association is formed by 18 companies located in the region of Rio Grande do Sul, Brazil. The strategic alliance of APL – Metal Centro is an example of how companies work together to obtain different benefits, this is one of the reasons it was chosen for the implementation of the 3D model to test its functionality.

As stated before, for the implementation of the 3D Model, an online questionnaire needs to be answered by the majority of the companies that make part of the strategic alliance in order to gather information that helps describe the reality in a more exact way. It is difficult to make everyone to get involved with the research and spend time and effort to answer a survey. For the analysis of the performance of the strategic alliance APL – Metal Centro, a 61% of response was attained. It is important to mention that one company refused to answer the online questionnaire, arguing that it has an extense number of questions and they were already involved in several bureaucratic issues, therefore they had no time to complete the questionnaire. This can be seen as an improvement opportunity. Another argument they mentioned is that online surveys tend to gather low quality data, they mentioned that in order to get better results it would be better to perform the survey in person. This can be also seen as an opportunity of improvement for future research in this area. According to Zhang and Conrad (2014), in answering web surveys people expend only enough effort to provide acceptable, but not necessarily accurate, responses.

The process of implementation of the model was developed in two steps.

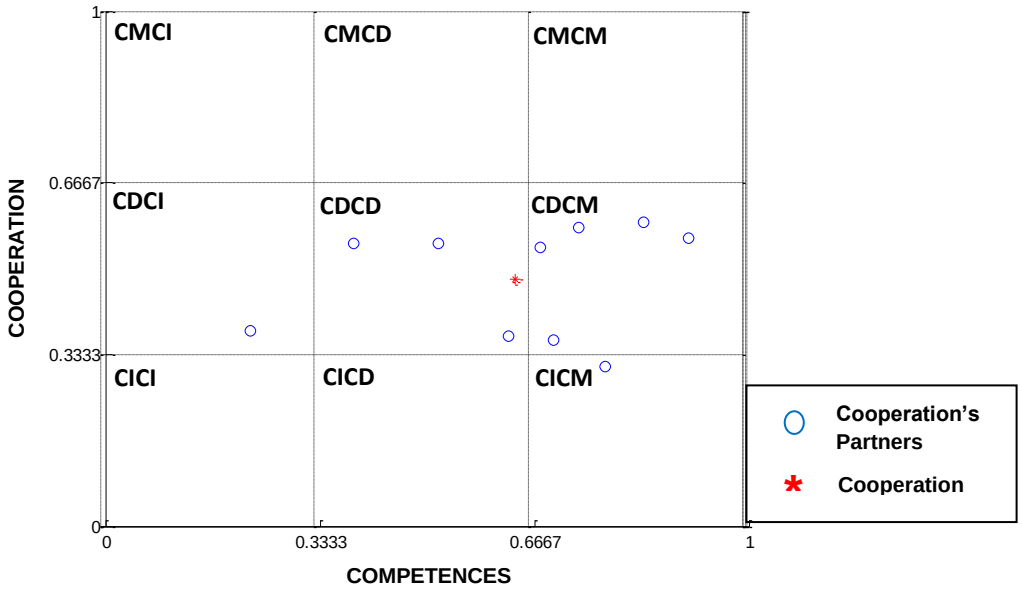
1° The questionnaire shown in Appendix 2 was modified to better suit the context of the companies that make part of the APL – Metal Centro. This questionnaire was sent by e-mail to all the managers of each company in the APL – Metal Centro and it must be completed online. Only 11 companies out of 18 answered the online survey.

2° The data obtained from the questionnaires was analyzed in the second step. As mentioned before, the questionnaire uses a Likert-scale, it has five different possible answers and each answer is translated into a numerical value between 0 and 1, being 0 “totally disagree” and 1 “totally agree”. These values are the input data

for the model which provides the user of a coordinate for each individual company and for the strategic alliance

The results for APL – Metal Centro are presented in Figure 16. The model clearly shows that the strategic alliance is situated on the transition site. There are two companies situated on the risk site, causing a negative impact on the development of the strategic alliance. This graphic representation shows the main problems that need to be approached in order to improve the development of the alliance. One of the companies situated on the risk site needs to pay special attention to their individual competences, while the second company, situated also on the risk site, needs to work on cooperative factors. It can also be seen that most of the companies are situated on the transition site and on average most of them have well developed their individual competences, but they have to pay special attention on developing strategies to promote cooperation among the alliance. This face of the model represents the X-Y axis face. The complete questionnaire including the data gathered from each individual company is presented in Appendix 2.

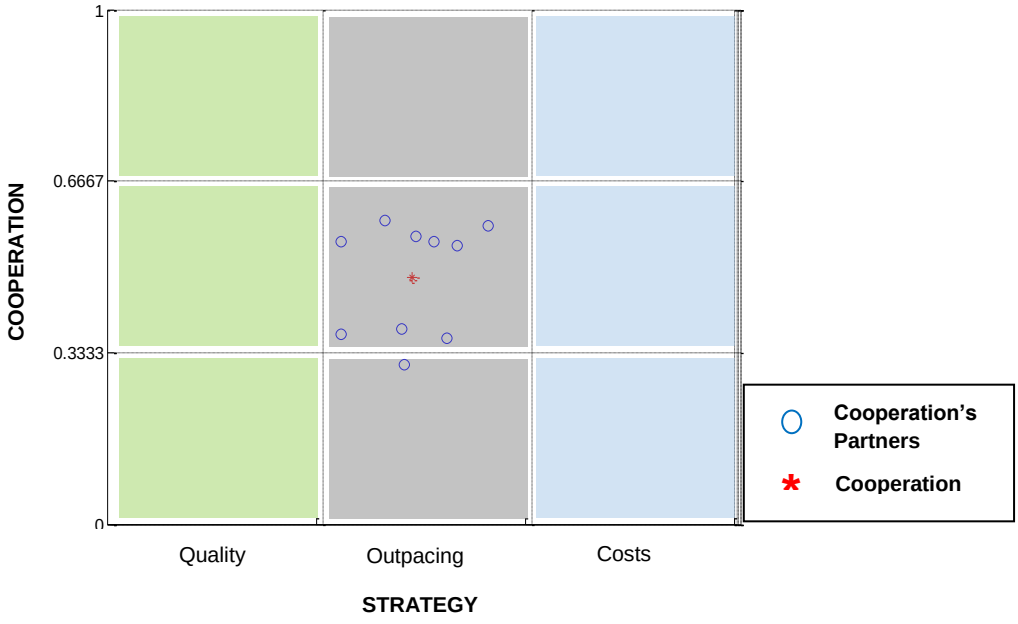
Figure 16. **3D Model Cooperation vs Competences APL – Metal Centro**



Source: Elaborated by the author

Another face of the 3D model informs which strategy is being followed by each individual company and by the strategic alliance itself. This face of the model represents the Z-Y axis face. The result for the APL – Metal Centro is presented in Figure 17. It can be seen that all of the companies in this alliance and the cooperation as well, are situated in the outpacing strategy. Some companies are more inclined towards quality or costs strategies, but in general they all work with strategies that concern both of them. The outpacing strategy, as stated before, is seen as a strategy that puts together the advantages of quality and costs strategies. The Y axis, in this case, represents also factors of the cooperation as in Figure 16. It was decided to combine individual and strategy factors to emphasize the importance of cooperative factors as the main subject of evaluation is the performance of the whole cooperation.

Figure 17. **3D Model Cooperation vs Strategy APL – Metal Centro**



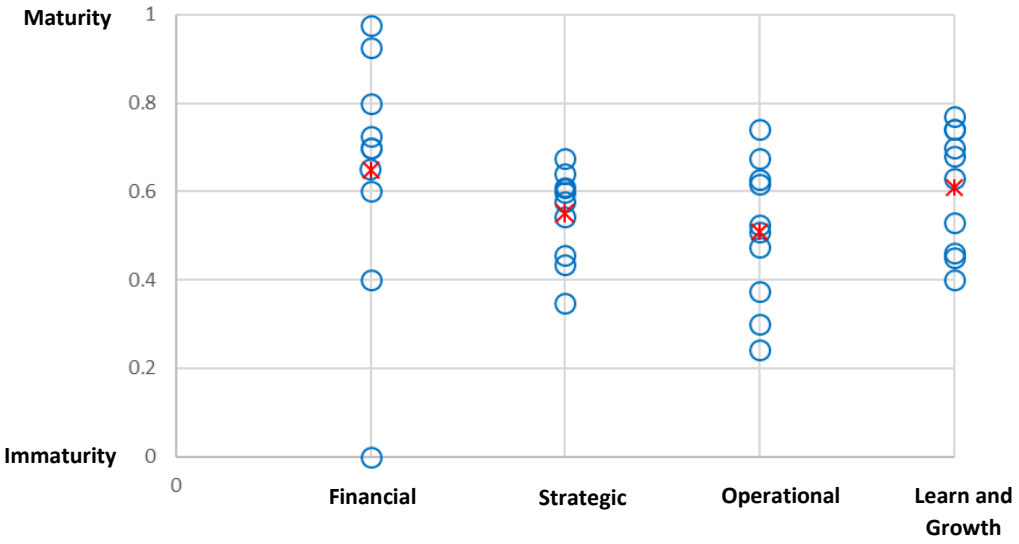
Source: Elaborated by the author

The second way of analyzing the performance of strategic alliances using the information gathered in the online surveys is with the graph that present the data

based on the balanced scorecard factors, the graph with the information of APL – Metal Centro is shown in Figure 18. The red mark represents the strategic alliance APL – Metal Centro, while the blue marks represent each individual company. Each company should be concentrating on the factor where they scored the lowest. As an average, companies are doing worst on operational factors, so they could use this information as basis to develop new strategies. It is important to notice that based on the results from Figure 16, on average all of the companies on the APL-Metal Centro strategic alliance scored low on cooperative factors, so in this case they should focus on identifying and analyzing operational factors that could also help them improve their relation with other companies in the alliance. For example, investing resources on training centers for common use.

This graph allows the user to identify where they should focus their efforts on the competences where they scored the lowest points and in this way, improve the performance of the company and of the cooperation as well.

Figure 18. **Balanced Scorecard Factors Evaluation of APL – Metal Centro**



Source: Elaborated by the author

5.2 Application of the Model in Sonnen Energia Franchises

The company Sonnen Energia started in 2012 as a startup in the city of Santa Maria, Brazil. This company works in the sector of photovoltaic solar energy. They develop structures for the installation of photovoltaic cells and they also provide installation services for their clients.

Sonnen Energia is a specialist in solar energy. They act in national markets, as well as in international markets. The company promotes the generation of green energy and they contribute for the sustainable development of the country.

The company has already 12 franchises in the state of Rio Grande do Sul, they export nationally and internationally. The two franchises with the highest turnover are the ones in the city of Cruz Alta and in Salto do Jacuí. For the purpose of this study, it was decided to analyze the performance of the company Sonnen Energia by analyzing only the two most important franchises.

Franchises can be understood as a horizontal alliance having the objective of entering new markets. The company Sonnen Energia was chosen for the implementation of the 3D model in its franchises due to its accessibility and because franchises work together to enter new markets, this is one of the benefits they get by establishing common goals. The process of implementation of the model this company was developed in two steps, the same way as in the implementation the alliance of APL – Metal Centro.

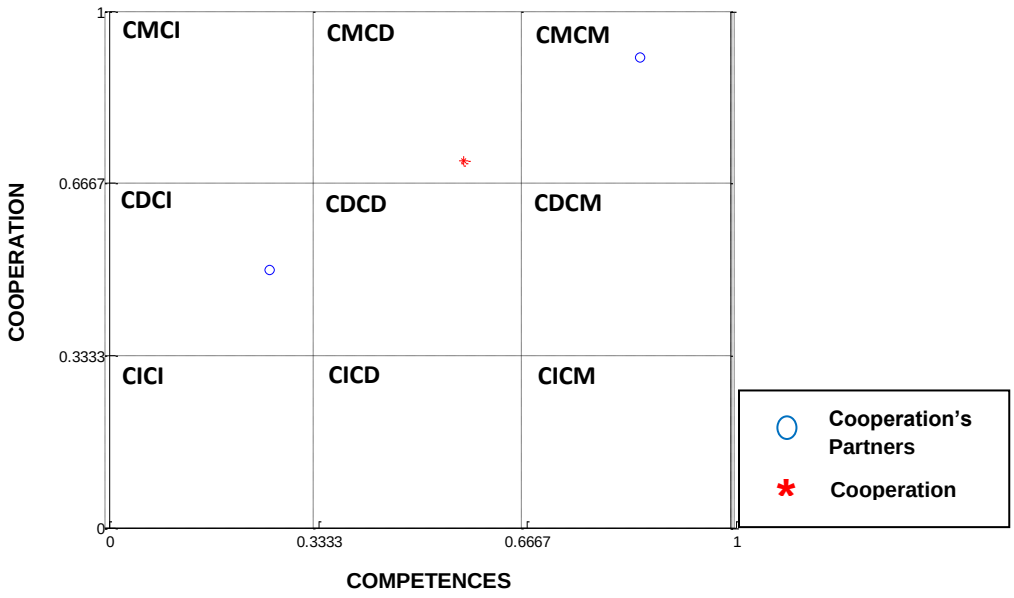
1° The questionnaire shown in Appendix 2 was modified to better suit the context of the company Sonnen Energia. It was applied in the two most important franchises, the one in Cruz Alta and the one in Salto do Jacuí, Rio Grande do Sul. As the number of franchises is low, it was easy to obtain a 100% of response.

2° The data obtained from the online surveys was analyzed during this second step in order to produce a visual report that makes it easier form management in the process of decision making. The results for Sonnen Energia are presented in Figure 19. This face of the model represents the X-Y axis.

The model clearly shows that one franchise is not working as well as the other one. This causes the company to be situated in the transition site. It can also be seen

that the cooperation scored higher on cooperative factors, than on individual factors. This can be perceived as a positive result, because now the user can identify where are the main problems and what they can do different to improve their performance. It is important to notice that one franchise scored very low on individual competences, this result is making the performance of Sonnen Energia to be situated on the transition site. In this case it is better to pay special attention on this one franchise, as the other one is already situated on the site of maturity. The complete questionnaire including the data from the two franchises is presented in Appendix 3.

Figure 19. **3D Model Cooperation vs Competences Sonnen Franchises**



Source: Elaborated by the author

While one franchise is situated in the maturity site for cooperation and individual competences, the other franchise is situated on the risk site. This result can be translated as a need for the company situated on the risk site to increase efforts to improve individual and cooperative competences. As they scored lower on individual competences, for example they could establish short and long-term growth targets to improve their financial competences, or implement a quality control system to

improve productive competences, also they could focus on the learning and growth competences, for example by motivating employees to continue further education. In order to know which specific individual competences the user can analyze the evaluation of balanced scorecard factors shown in Figure 21.

The corporate strategy being followed by each franchise and by the company Sonnen Energia is presented in Figure 20. This face of the model represents the Z-Y axis. It can be seen that both franchises and the cooperation as well, are situated in the outpacing strategy. This is a positive result, as stated before, outpacing strategy combines quality and costs strategies, making the company able to attain success in both factors.

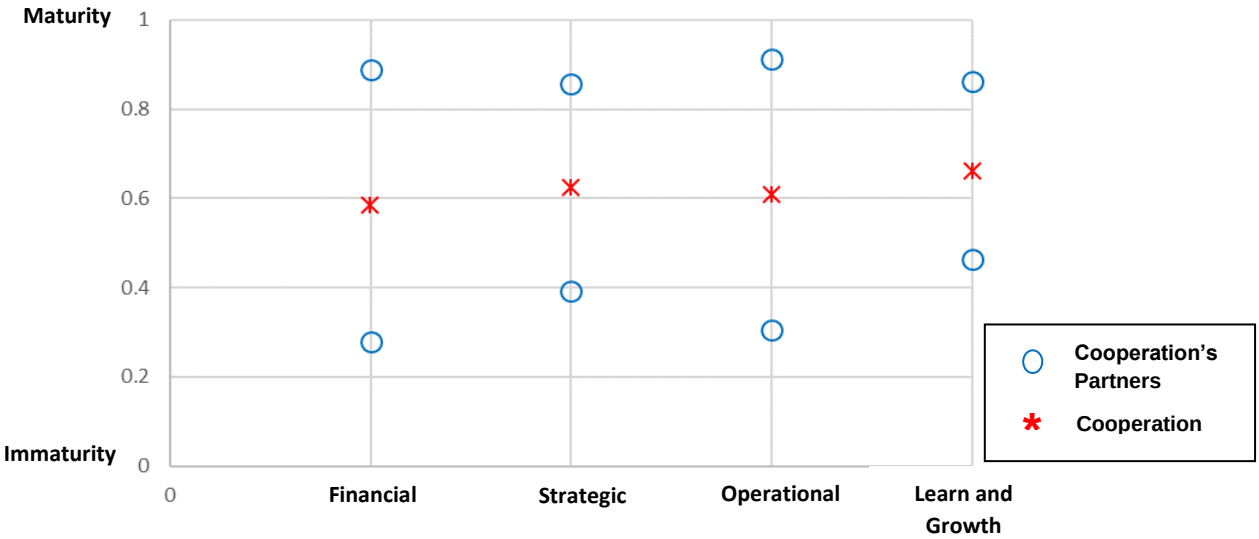
Figure 20. **3D Model Cooperation vs Strategy Sonnen Franchises**

Source: Elaborated by the author

In order to identify which specific factors each company should expend time and efforts they can analyze the graph that describes the performance of each balanced scorecard factors, this graph with the results for Sonnen Energia is shown

in Figure 21. The red mark represents the company Sonnen Energia, while the blue marks represent the franchises. The franchise with the lowest score should be concentrating on its financial and operational competences, as they are the factors with the lowest punctuation. This franchise could use these results to develop new strategies to ensure success and help improve the performance of Sonnen Energia.

Figure 21. **Balanced Scorecard Factors Evaluation of Sonnen Franchises**



Source: Elaborated by the author

In order to improve the perfomance of the company, Sonnen Energia could implement standardized procedures in all of their franchises, in terms of production, sells, training of employees, etc.

6 FINAL CONSIDERATIONS

As previously stated, the number of failures in strategic alliances is growing with the time. There are not enough tools that help companies to evaluate their performance when being part of a cooperation. The two models found in the literature that contribute to this evaluation of strategic alliances are the Petter model (2012) and Weise model (2005). Both of them having their own advantages and disadvantages and providing different valuable information to the user about the status of their company and the cooperation as well.

With this context, the objective of this master thesis was to develop a new model that could bring together the advantages of the two analyzed models and make the implementation process easier. This objective was attained, as it was possible to build a new model having as base the two existing models in the literature for the evaluation of the performance of strategic alliances.

The presented model was developed with the intention of providing a deeper analysis of strategic alliances' performance and to simplify the implementation process of already existing models in the literature, by modifying the questionnaire used for data collection.

The 3D model was implemented in two different strategic alliances in the city of Santa Maria, Brazil: APL - Metal Centro and Sonnen Energia. A deep analysis on the performance of both cooperations was made. For the APL – Metal Centro it was identified that two companies, out of 10 evaluated, are situated on the risk site. According to Weise (2012), if the cooperation is not being productive for one company being part of it, then it makes the whole cooperation unproductive. However, the model helps the user to identify where are the main problems that need to be approached in order to improve the performance of the strategic alliance. In the case of APL – Metal Centro, it was identified that one of the companies situated on the risk site needs to focus on individual competences, and analyzing the graph of balanced scorecard factors it can be seen that operational factors are the ones that scored the lowest, so this could be the base to start developing new strategies. The second company situated on the risk site scored the lowest in cooperative factors, in

this case it could be suggested to create new strategies to make this company get more involved in collaborative activities or remove it from the strategic alliance, both actions, could help improve the performance of each individual firm and the cooperation itself.

For the Sonnen Energia franchises it was identified that one of the franchises scored lower on its individual competences. The model specified exactly which competences they could focus their effort, being them financial and operational factors. These franchises should develop new strategies based on the results of the evaluation of the performance of the company, in order to have greater probabilities of success.

The 3D Model makes it possible to give a score to the performance of individual companies involved in a strategic alliance and also to identify specific factors where these companies should focus to improve their performance and at the same time the performance of the alliance. The results of the evaluation of APL – Metal Centro and Sonnen Energia proves the applicability of the model.

For future research, it is suggested the modification of the model so it can be specific for micro and medium enterprises or big enterprises. In this way, the questionnaire can be adapted for different needs. The developed questionnaire is the most important step on the implementation of the 3D Model, because it is the way of gathering information that will be translated into the results of the evaluation of the performance of strategic alliances. It should be taken into account the time needed to answer the questionnaire, as people tend to analyze in a better way their answers in shorter questionnaires. Even when the number of indicators was reduced compared to Petter model (2012), the 100% of response rate was not reached. Another important factor is the way the questionnaire is implemented. The questionnaire was sent by e-mail to all the members of the network APL - Metal Centro and to the franchises from the company Sonnen Energia, it is probable that if the implementation of the suggested questionnaire was face to face, the response rate could be higher.

As explained before, one company within the APL - Metal Centro network, argued that it was not possible for them to answer more than 20 or 30 questions due

to the large number of bureaucratic issues they must deal with. They also stated that the implementation of the survey face to face could generate a higher response rate, that online surveys. It is understandable that long surveys have a risk of obtaining low quality results, as people tend to invest low efforts on activities in order to finish them as quickly as possible.

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APPENDIX 1 - INDIVIDUAL QUESTIONNAIRE FOR COMPANIES

KSF1	*KSF2*	*VARIABLE*	*INDICATOR*	*ANSWER*				
FINANCIAL	**Competence**	**F1. Availability of working capital**	1. The company have clear knowledge of the working capital required for its operations.	-1	2	3	4	5+
			2. The company is able to maintain the required working capital for its operations, without the need to borrow, finance, etc.	-1	2	3	4	5+
		F2. Control of degree of indebtedness	3. The company has control over its degree of indebtedness, not being this a management difficulty.	-1	2	3	4	5+
			4. Loans are done in a planned and calculated manner and never in an emergency.	-1	2	3	4	5+
		F3. Costs	5. The company clearly knows the fixed and variable costs that make up the final cost of its finished products or services.	-1	2	3	4	5+
			6. Price and profit margins are defined based on a cost worksheet.	-1	2	3	4	5+
			7. The company has control over the cost of its stock.	-1	2	3	4	5+
		F4. Financial Planning	8. The company has a formalized investment plan (plant expansion, purchase of equipment, etc.) in the medium and long term.	-1	2	3	4	5+
			9. The company has defined growth targets in the medium and long term.	-1	2	3	4	5+
			10. The company has defined billing and profitability goals.	-1	2	3	4	5+
STRATEGIC	**Strategy**	**S1. Identification of the method of reducing costs as a competitive strategy adopted by the company**	11. Your company is focused on reducing costs to offer lower prices than the competition.	-1	2	3	4	5+
			12. Your company is focused on targeting a specific sector of the market through lower prices than the competence.	-1	2	3	4	5+
			13. Your company offers standardized products or services for cost reductions.	-1	2	3	4	5+
			14. Your company minimizes costs in areas such as research and development, customer service, sales, marketing, etc.	-1	2	3	4	5+
			15. You agree that cost reduction is the main goal of the network.	-1	2	3	4	5+
		S2. Identification of the method of	16. Your company is focused on increasing the quality of its products or services.	-1	2	3	4	5+

		quality focus as a competitive strategy adopted by the company	17. Your products or services have a high price compared to the competence due to their high quality.	-1	2	3	4	5+
			18. Your company is focused on certain aspects of the quality of its products or services to suit a specific market.	-1	2	3	4	5+
			19. Your company does not minimize the costs of areas such as research and development, customer service, sales, marketing, among others.	-1	2	3	4	5+
			20. You agree that increasing the quality of products or services of companies within the network is the main goal of the network.	-1	2	3	4	5+
		S3. Identification of the mixed method of cost reduction and increase in quality as a competitive strategy adopted by the company (outpacing)	21. The company seeks to implement high quality in its products or services by maintaining a price within the market standards.	-1	2	3	4	5+
	Cooperation	**S4. Mutual dependence among associated companies**	22. You feel that your company is more competent for participating in the network.	-1	2	3	4	5+
			23. Your company has developed a competence by participating in the network.	-1	2	3	4	5+
			24. In your perception, if your company abandons the network, it becomes less competitive.	-1	2	3	4	5+
	Competences	**S5. Company and brand reputation**	25. The company can identify the values that are attributed to its brand.	-1	2	3	4	5+
			26. The company has mechanisms to publicize and strengthen its name or brand.	-1	2	3	4	5+
			27. The company has a policy for brand management (use of a logo, use of slogan, etc.).	-1	2	3	4	5+
		S6. Management of intellectual capital	28. There are internal records of procedures and flow processes (such as manuals, flowcharts, norms, etc.).	-1	2	3	4	5+

			29. The company intends to use or uses certification standards (such as ISO standards, among others specific to the industry).	-1	2	3	4	5+
			30. The company has registered a patent arising from an innovation developed by its employees.	-1	2	3	4	5+
	Cooperation	**S7. Capacity of adaptation and mobilization**	31. Your company has modified / adapted its management systems (of products, services, processes or administrative) to align itself strategically with the other companies in the network.	-1	2	3	4	5+
			32. Your company has promoted an adaptation in its internal culture to work together with the other companies in the network.	-1	2	3	4	5+
		S8. Strategic alignment	33. Your company shares or defines strategic actions (objectives, goals, etc.) with other companies from the network.	-1	2	3	4	5+
	Competences	**S9. Ability of the company to identify its weaknesses**	34. Your company has a clear perception of weaknesses in its production or service operations.	-1	2	3	4	5+
			35. Your company has a clear perception of weaknesses of your products or services.	-1	2	3	4	5+
			36. Your company has a clear perception of weaknesses in its administrative area.	-1	2	3	4	5+
		S10. Ability to develop strategic benchmarking	37. The company can identify the competencies and capabilities of its main competitors.	-1	2	3	4	5+
			38. The company use ideas from its competitors to improve its productive and / or administrative system.	-1	2	3	4	5+
		S11. Ability to innovate and respond to market demands	39. Your company has the ability to incorporate innovations into your products or services and processes.	-1	2	3	4	5+
			40. The company use patents and third-party records as an innovation tool for its processes, products, and / or services.	-1	2	3	4	5+
			41. The company cares and seeks to know market trends and innovations in the sector in which it operates.	-1	2	3	4	5+

	Cooperation	**S12. Results through cooperation over time**	42. The company has obtained gains in productivity and / or profitability due to collaborative actions between your company and other companies in the network.	-1	2	3	4	5+
			43. The company has obtained competitive differentials in its products or services due to collaborative actions between your company and other companies in the network.	-1	2	3	4	5+
			44. The company has already obtained gains in terms of market recognition due to the collaborative actions between your company and other companies of the network.	-1	2	3	4	5+
OPERATIONAL	**Competences**	**O1. Training of employees**	45. The company has a policy of training and qualifying its employees at all levels (administration and production).	-1	2	3	4	5+
			46. Employee qualification is a strong asset of your company.	-1	2	3	4	5+
			47. Your employees are trained prior to assuming a role in the company.	-1	2	3	4	5+
			48. The company has a policy to encourage its employees to continue their education.	-1	2	3	4	5+
		O2. Human resources in the company	49. There are formal channels for collecting ideas and suggestions from employees seeking improvements in the company.	-1	2	3	4	5+
			50. Employees have freedom for innovation and creativity.	-1	2	3	4	5+
			51. There is a policy for retention of employees, to minimize their turnover.	-1	2	3	4	5+
			52. There tools or mechanisms for the recognition of well-performing employees.	-1	2	3	4	5+
			53. Employees are invited to participate in the company's strategic decision making.	-1	2	3	4	5+
			54. The company offers benefits to its employees (such as health plan or profit sharing, etc.).	-1	2	3	4	5+
		O3. Formalization of production management	55. The company has a formalized operations control system (for example, you have a person responsible for control worksheets or short- and medium-term schedules, etc.).	-1	2	3	4	5+

			56. The company has a quality control system.	-1	2	3	4	5+
			57. The layout of the company is well planned and optimized.	-1	2	3	4	5+
			58. A system for demand forecasting is used to feed your company's production planning.	-1	2	3	4	5+
		O4. Technological qualification of production	59. The development of new products or services is done in a systematic way (using tools, methods, schedules, etc.).	-1	2	3	4	5+
			60. The improvements and optimizations of the production processes are done in a systematized way.	-1	2	3	4	5+
			61. The technological level of the company's equipment is compatible or better than those of the competition.	-1	2	3	4	5+
			62. The technological level of the company's equipment is compatible with the demand and with the development of new products or services.	-1	2	3	4	5+
		O5. Production capacity	63. The company is aware of its productive bottlenecks.	-1	2	3	4	5+
			64. The company has strategies for the flexibility of production capacity (extra shift, overtime, outsourcing).	-1	2	3	4	5+
			65. The company has full knowledge of the productive capacity of each installed equipment.	-1	2	3	4	5+
			66. The company has control of the time spent on stationary machines (maintenance, setup, etc.).	-1	2	3	4	5+
	Cooperation	**O6. Management and control mechanisms**	67. Your company uses standardized criteria for the selection of its suppliers of raw materials, supplies, etc.	-1	2	3	4	5+
			68. Your company uses documents standardized by the network (contracts, agreements, etc.) to negotiate with partners outside the network (suppliers, customers, support entities, etc.).	-1	2	3	4	5+
		O7. Diversity of partners and Standardization of Structure (affinity)	69. Your company uses management tools (for products, services, processes or administrative) that are standardized with other companies in the network.	-1	2	3	4	5+

			70. There is standardization of attributes (cost, quality, flexibility or design) between your company's products or services and the ones of the other companies in the network.	-1	2	3	4	5+
		O8. Infrastructure for the network's companies.	71. Your company invests resources (financial, human, etc.) for training and / or maintenance of research and development centers for common use within the network's companies.	-1	2	3	4	5+
			72. Your company invests resources (financial, human, etc.) for training and / or maintenance of training centers of common use within network's companies.	-1	2	3	4	5+
		O9. Proximity between the network's companies	73. Being close to other companies within the network helps improve collaborative relationship.	-1	2	3	4	5+
			74. Being away from other companies within the network DOES NOT difficult collaborative relationship.	-1	2	3	4	5+
RELATIONSHIP		**R1. Level of interaction and communication between the network's companies**	75. There are frequent encounters between you and other network managers to discuss issues inherent to your business.	-1	2	3	4	5+
			76. Meetings (with your knowledge and support) take place between your employees and employees of the network's companies, aiming to exchange experiences and information.	-1	2	3	4	5+
			77. Meetings (with your knowledge and support) of fraternization (games, championships, festivities, tournaments, etc.) take place between your employees and employees of other network's companies.	-1	2	3	4	5+
		R2. Affinity between the companies of the network	78. You agree that your company shares the same cooperative values as the other companies in the network.	-1	2	3	4	5+
			79. You agree that your company has the same objectives and goals (to be reached cooperatively) than the other companies in the network.	-1	2	3	4	5+
			80. You believe that the other network's companies are trusted for information sharing.	-1	2	3	4	5+

		R3. Invested efforts by each of the network's companies	81. The company has participated or participates together with other companies within the network in fairs, exhibitions, product or service shows, among others.	-1	2	3	4	5+
			82. Your company has already developed or develops products or new services together with other companies from the network.	-1	2	3	4	5+
		R4. Increased stability	83. You perceive that the relationships between your company and the other companies from the network have become more reliable, more frequent and more consistent.	-1	2	3	4	5+
		R5. Removal of obstacles, constraints and limitations	84. Your company has already proposed solutions to common internal problems among the network's companies (lack of skilled labor, rapid response to demand, flexibility, etc.).	-1	2	3	4	5+
			85. Your company has already proposed solutions to common problems external to the network's companies (relationships with support entities, etc.).	-1	2	3	4	5+
		R6. Equity of rights and duties	86. Your company participates in collaborative actions in the same proportion as the other companies in the network.	-1	2	3	4	5+
			87. You consider all relationships between the network's companies fair (win-win relations).	-1	2	3	4	5+
			88. You consider that your company receives benefits from the network in the same proportion as it benefits the development of the network.	-1	2	3	4	5+
		R7. Management of incompatibilities between partner companies	89. The cultural and value diversity existing between your company and other companies in the network are well managed, not difficulting the networks' actions.	-1	2	3	4	5+
			90. The different systems of management, productive capacity and technological level between your company and the other network's companies do not generate difficulties in the network's relationship.	-1	2	3	4	5+
		R8. Network's internal conflict management	91. The actions of the other companies from the network, in relation to your company, are respectful and do not hurt the trust and commitment of the network.	-1	2	3	4	5+

			92. You agree that there is no interference or disloyalty from the other companies from the network in relation to your company.	-1	2	3	4	5+
			93. Despite conflicts and divergences, you consider that there is a good relationship between your company and the other companies in the network.	-1	2	3	4	5+
		R9. Ability to manage different expectations and interests from the companies in terms of the network	94. Your company carries out actions that contribute to increase the collective efficiency of the network.	-1	2	3	4	5+
			95. Your company carries out actions that help increase the competitiveness of the network.	-1	2	3	4	5+
			96. You consider that the different expectations between your company and the other companies in the network do not create difficulties for the successful development of the network.	-1	2	3	4	5+
		R10. Governance formalization and the relationship between the companies from the network	97. Your company participates with certain frequency in network's governance (general affairs) meetings.	-1	2	3	4	5+
			98. Your company participates in actions to update and improve (contractual, goals and objectives, etc.) the network's governance.	-1	2	3	4	5+
			99. Your company invests resources (financial, human, etc.) to improve and optimize the network's governance.	-1	2	3	4	5+

Source: Adapted from Petter (2012) and Weise (2005)

APPENDIX 2 – BASE FOR THE DIAGNOSIS OF APL METAL CENTRO

KSF1	*KSF2*	*VAR.*	*IND.*	*COMPANY*									
				C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**
FINANCIAL	**Competence**	**F1.**	1.	1	0.5	0.75	1	1	1	0.75	0	1	0.75
			2.	1	0.5	1	0.75	0	0.5	0.25	0	1	0.5
		F2.	3.	1	0.5	1	1	0	0.5	0.25	0	1	1
			4.	1	0.5	1	1	0	0.5	0.5	0	1	0.75
		F3.	5.	1	0.5	0.75	1	1	0.5	0.75	0	1	1
			6.	1	0.5	0.75	1	1	0.5	0.75	0	1	1
			7.	0.75	0.25	0.5	1	1	1	0.75	0	0.25	0.75
		F4.	8.	0.5	0.25	0.5	1	0.75	0.5	1	0	0.5	0.5
			9.	1	0.25	0.5	1	0.75	0.5	1	0	0.25	0.75
			10.	1	0.25	0.5	1	1	0.5	1	0	0	1
STRATEGIC	**Cooperation**	**S1.**	11.	0.5	0.75	0.75	0	0.5	0	0.5	0.25	0	0.75
			12.	0.5	0.5	0.75	0	0.75	0.25	0.5	0.5	0	0.5
			13.	0.25	0.75	0.75	0	1	0	0	0.25	0	0.25
	Competences	**S2.**	14.	0.75	0.25	0.75	1	1	1	0.75	0	1	0.75
			15.	0.75	0.75	0.75	1	1	1	1	0.5	0	0.5
			16.	0.75	0.75	0.5	1	1	1	1	0.75	1	0.75
		S3.	17.	1	0.25	0.25	1	0.5	0.75	1	0.25	0.25	0.75
			18.	0.75	0.25	0.25	0	0	0.75	0.75	0.75	0	0.75
			19.	1	0.75	0.25	1	1	0.75	1	1	0.5	0.75
	Cooperation	**S4.**	20.	0	0	0.25	0	0	0	0.25	0	0	0
			21.	0.25	0	0.5	0.5	0	0	0.5	0.5	0	0
		S5.	22.	0.25	0	0	0.75	0	0.5	0	0.25	0	0.5
	Competences	**S6.**	23.	1	0.5	0.75	1	1	1	0.75	0.25	1	0.75
			24.	1	0.5	0.75	1	0.75	1	0.75	0.25	1	0.75
			25.	1	0.5	0.75	1	1	1	0.75	0.25	1	0.75
		S7.	26.	1	0.5	0.5	0.75	0.75	0.5	0.75	0	1	0.75
			27.	1	0.75	0.75	0.75	0	0.5	0.75	0.25	1	0.75
		S8.	28.	0.75	0.25	0.75	1	1	1	1	0.5	1	0.5
			29.	0	0	0	1	0	0.5	0.25	0	0	0.5
			30.	1	0.5	0.75	1	1	1	0.75	0.25	1	0.75
	Cooperation	**S9.**	31.	0.75	0.75	0.75	0.5	0.5	0.5	0.25	0.5	0.25	0.75
			32.	0.75	0.75	0.5	0	0.5	0.5	0	0.25	0	0.5
			33.	0.5	0.5	0.5	0.5	0.75	0.5	0	0.5	0	0.75
OPERATIONAL	**Competences**	**O1.**	34.	0.5	0.25	0.25	0.75	1	0.5	0.5	0.25	0	0.5
			35.	0.5	0.25	0.5	0.75	1	0.5	0.75	0.25	0	0.25
			36.	0.5	0.5	0.5	0.75	1	0.5	0.5	0.25	0.75	0.75
			37.	1	0	0.25	1	1	0.75	1	0.25	0.5	0.5
		O2.	38.	0.5	0	0	0.75	0.5	0.5	0.75	0	0.5	0
			39.	0.75	0	0.75	1	1	0.5	0.75	0.25	1	0.75
			40.	0.75	1	0.5	1	1	0.5	0.75	0	0	0.5
			41.	0.5	0	0.25	1	1	0.5	1	0	0.5	0.5

			42.	1	0	0.25	0.75	0	0.5	0.75	0.25	0	0.75
			43.	0.5	0	0	1	0.5	0.75	1	0.5	1	1
		O3.	44.	1	0.25	0.25	1	1	0.75	0.75	0.25	0	1
			45.	1	0.75	0.5	0.75	1	0.75	0.75	0	0.5	0.5
			46.	0.75	0.5	0.5	0.75	0	0.5	0.75	0.5	1	1
			47.	1	0.5	0.25	1	1	0.75	0.75	0.25	0.5	0.5
		O4.	48.	0.75	0.25	0.25	1	0.5	1	1	0.25	1	0.5
			49.	0.75	0.25	0.25	1	1	0.75	1	0.25	1	0.5
			50.	1	0.5	0.5	1	1	0.75	0.5	0.5	1	0.75
			51.	1	0.5	0.5	1	0.25	0.75	0.5	0.75	1	0.75
		O5.	52.	1	0.75	0.75	1	1	0.75	0.75	0.5	1	0.75
			53.	1	0.5	0.5	1	1	0.75	1	0	0	1
			54.	1	0.5	0.5	0.75	1	0.75	1	0.25	1	0.75
			55.	1	0.25	0.75	0.5	1	0.5	1	0	0	0.25
		O6.	56.	0	0	0.25	0	0	0	0	0	0	0
			57.	0	0	0	0	0	0	0	0	0	0
		O7.	58.	0.25	0.25	0.75	0	0	0	0	0	0	0
			59.	0.5	0	0	0.25	0	0	0	0	1	0
		O8.	60.	0.25	0	0	0.5	0	0.25	0	0	0	0
			61.	0.25	0	0	1	0	0.25	0	0.25	0	0.5
		O9.	62.	1	0.75	0.75	1	1	0.5	0.25	0.5	0	1
			63.	0.25	0.5	0.75	0	0	0.5	0.75	1	1	0
RELATIONSHIP	**Cooperation**	**R1.**	64.	1	0.75	0.5	0.75	0.5	0.5	0.25	0.5	0.5	0.5
			65.	0	0	0	0.75	0	0.25	0.25	0.25	0.25	0
			66.	0.25	0	0	0.5	0	0	0.5	0	0	0
		R2.	67.	1	0.75	0.75	0.75	0.75	0.5	0.5	0.5	1	0.5
			68.	1	0.5	0.5	0	1	0.5	0.5	0.25	1	0.5
			69.	1	1	0.75	0.5	1	0.75	0.25	0.5	0.25	0.75
		R3.	70.	1	1	0.75	0.75	1	1	0.75	0.75	0	1
			71.	0.5	1	0.25	0	0	0.25	0.5	0.25	0	0.25
		R4.	72.	1	0.75	0.75	0.75	0.75	0.5	0.25	0.25	0.75	0.5
		R5.	73.	0.5	0.5	0.5	1	0.75	0.5	0.75	0.5	1	0.75
			74.	0.5	0.75	0.5	1	1	1	1	0.5	1	0.75
		R6.	75.	1	0.5	0.5	0.75	0.75	0.25	0.25	0.5	0	1
			76.	1	0.75	0.75	0.75	1	0.5	0.25	0.5	0	1
			77.	1	0.75	0.75	0.25	0.75	0.5	0.25	0.5	0	0.75
		R7.	78.	1	0.75	1	1	1	0.25	0	0.5	1	0.25
			79.	1	0.5	0.75	0.75	1	0.25	0.5	0.25	1	0.75
		R8.	80.	1	1	1	1	1	0.75	0.25	0.5	1	1
			81.	1	1	1	1	1	0.75	0.25	0.75	0.75	0.75
			82.	1	1	1	1	1	1	0.5	0.75	1	1
		R9.	83.	0.5	0.75	0.5	1	0.75	0.25	0.25	0.5	0	0.75
			84.	0.5	0.5	0.75	1	0.75	0.25	0.5	0.5	0.25	0.75
			85.	0.75	0.5	0.75	0.75	1	0.25	0.25	0.5	1	0.5
		R10.	86.	0.5	1	0.75	1	1	0.25	0.5	0.5	0.75	1
			87.	0.25	1	0.75	1	1	0.25	0.5	0.5	0.75	1
			88.	0.25	0.5	0.25	0.5	0.5	0.25	0.25	0.25	0	1

Source: Elaborated by the author

APPENDIX 3 – BASE FOR THE DIAGNOSIS OF SONNEN ENERGIA

KSF1	*KSF2*	*VAR.*	*IND.*	*COMPANY*	
				C1	**C2**
FINANCIAL	**Competence**	**F1.**	1.	0.25	0.75
			2.	0	0.75
		F2.	3.	0.75	1
		F3.	4.	0.75	1
			5.	0.75	0.75
			6.	0	1
		F4.	7.	0	1
			8.	0	1
			9.	0	0.75
STRATEGIC	**Cooperation**	**S1.**	10.	0.75	1
			11.	1	1
			12.	1	1
	Competences	**S2.**	13.	0	1
			14.	0.5	1
			15.	0	1
		S3.	16.	0	0.5
			17.	0	0
	Cooperation	**S4.**	18.	0	1
			19.	0.75	1
		S5.	20.	0.5	1
	Competences	**S6.**	21.	0.25	0.75
			22.	0.25	0.75
			23.	0.25	0.75
		S7.	24.	0.25	0.5
			25.	0.75	1
		S8.	26.	0.25	1
			27.	0.5	1
	Cooperation	**S9.**	28.	0.25	0.75
			29.	0.75	1
			30.	0.25	1
OPERATIONAL	**Competences**	**O1.**	31.	0	1
			32.	0.75	1
			33.	0	0.75
		O2.	34.	0.5	0.5
			35.	0	0.75
			36.	0	1
			37.	0	0
		O3.	38.	0.75	1
			39.	0.25	1
			40.	0	1
			41.	0	1
		O4.	42.	0.25	1

			43.	0	1
			44.	1	1
			45.	1	1
		O5.	46.	0	1
			47.	0	1
			48.	0	1
		O6.	49.	0.25	1
			50.	1	1
		O7.	51.	0	1
			52.	0.5	1
		O8.	53.	0.75	1
RELATIONSHIP		**R1.**	54.	0	1
		R2.	55.	0.75	1
			56.	0.75	1
			57.	0.75	1
		R3.	58.	0.75	0.75
		R4.	59.	0.75	0.75
	Cooperation	**R5.**	60.	0.5	0.75
			61.	0.5	0.75
		R6.	62.	0.25	0.75
			63.	1	0.75
		R7.	64.	0.25	0.25
		R8.	65.	0.75	1
			66.	1	1
			67.	1	1
		R9.	68.	0	1
			69.	0	0.5
			70.	0	1
		R10.	71.	0	1
			72.	0	1
			73.	0.25	1

Source: Elaborated by the author