

# Business Partnership at the Information Technology Sector in Brazil

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**Abstract** – This article is made up of a case of application of Game Theory to business partners. It analyzes the partnership as an element that has consequences on the sustainable growth process of companies in the Information Technology (IT) industry in Brazil and presents the application of a model adopted by business partners on this sector. Research shows that partnership between IT companies with complementary profiles has beneficial effects and contributes to the sustainable growth of the companies in the IT sector, and consequently to this technology sector in Brazil.

**Keywords** – Game Theory, Business Partnership, Information Technology Sector.

## 1. Introduction

Nowadays societies face many challenges and obstacles resulting from economic, social and environmental imbalances, which are compounded by globalization phenomenon, imposed on all countries. Consequences of this globalization interfere in the way of thinking and acting of individuals and on the movements institutions make in the markets in which they compete. Faced with such a scenario, it is important to adopt certain principles and standards to guide human behavior in the individual and collective spheres.

This article develops an approach to model business partnership in the technology sector in Brazil. This reality is experienced by most business organizations in general, and in particular for companies located on Brazil (the country which is studied on this research), with a special emphasis on companies in the Information Technology (IT) sector.

In order to understand situations of conflict in the process of partnership, Game Theory framework was adopted, based on the mathematical logic and on the facilitates of the process of decision making. A game is characterized by conflicts of interest and considering the need to choose the best strategy for each player, it is therefore appropriate to use this theory which aims to forecast movements of other players, either competitors or allies, whoever they are standing the best way to achieve their desired results.

In a conflict situation at the time of decision, Game Theory allows each player to understand the logic of the problem/dispute, by seeing if there is a possibility for cooperation; by identifying the circumstances under which it is appropriate to cooperate or not; and/or by adopting strategies that may favor cooperation between players.

Considering also the Mechanism Design Theory, working as a catalyst for the analysis and serving to boost the study and allowing new emphases to the analysis of the context of business partnership in the Information Technology sector in Brazil.

Thus, there is a novelty in relation to what is usually studied in the context of theories involved in this article, which corresponds to the application of the Mechanism Design Theory to a practical situation involving the Information Technology sector and allowing a creative interconnection with the parts of methodological analysis and yet with the results and conclusions of the study.

This application is specific and is targeted to a specific situation, allowing to get innovative findings, which are settled considering many years of

experience and practice in a reference company in the Information Technology sector in Brazil by one of the researchers.

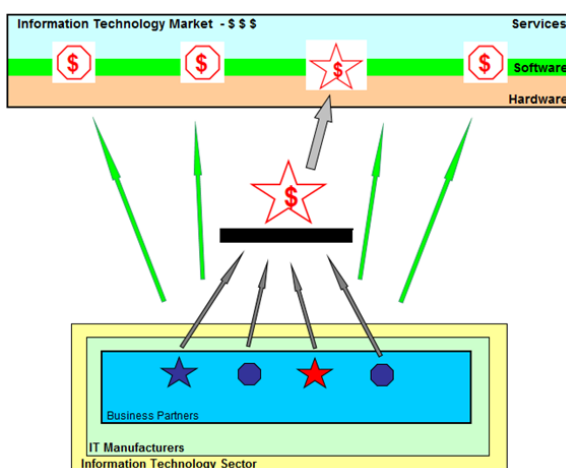
## 2. Research Objectives

The objective of this study is to analyze the concept of business partnership in the perspective of Game Theory as a way to contribute to the sustainable growth of Information Technology companies in Brazil. The basic working hypothesis is that, in Brazil, the strategies used in business partnership interfere in the sustainable growth of these companies, which were used in the present study as the analysis field.

The first motivation for this research was born during the development of the research master's thesis (see Albuquerque, 2010). According to Albuquerque (2010), there are several factors that interfere in the process of sustainable growth of companies in the information technology sector in Brazil, among which stands out partnership.

Considering that one of the researchers was an employee of a technology company for 25 years, having worked much of this period with business partnership and their mutual relations, the existence of a situation of conflict and competition is verified, what can be illustrated in the following figure.

**Figure 1.** Scenario involving suppliers (business partners) and clients in the Information Technology Sector.



Source: Authors' figure

Figure 01 shows the sector of Information Technology, represented by its suppliers and customers, highlighting a particular customer.

At the bottom, it is the ecosystem of the Information and Communication Technology industry suppliers who are represented by

manufacturers and their business partners. Those companies make up the supply chain and distribution of the Information Technology sector.

The central part of the figure represents the most attractive market. This market can be characterized by a particular industry or a particular customer, which has the characteristic of being a major consumer of technology and therefore arouses the interest of all industry vendors.

In this scenario, if all suppliers pursue the same market at the same time, the following facts may be experienced:

- Initially, companies will supply the market at the same time, so they come on a collision course with each other;
- In a second phase, when addressing the secondary market, they will not be well accepted because nobody wants to be the second. This reaction is typical of a market when it feels discredited.

Then it may be observed that:

- As there is a greater effort by the most attractive market, there will be an expense of additional resources among business partners disputing the market, which will decrease the profitability of companies;
- If the business partners losses come, a loss trend also for manufacturers happen, as they come pressured to reduce their profit margins.

If the manufacturer and business partners lose in an initial situation, it is possible to conclude that the market gains; however, this is a market short-term gain in the perspective of the researchers insight. Thus, the following question arises: In the long run, there will be specialized companies to meet customers?

It is important to say that the market (customer) needs companies experts in technology to serve them through IT solutions, and thus these companies may become more competitive in their respective business segment.

## 3. Literature Review

### 3.1 Game Theory

Fiani (2006, p.9) states that: "In an overview, Game Theory is the mathematical analysis of a situation involving a conflict of interest, to find out

the best options that, given certain conditions, should lead to the goal desired by a rational player.”

It is a mathematical theory created to model phenomena that can be observed when two or more decision makers interact with each other. It provides a way to describe conscious decision processes having goals that involve all players.

In this article, the theoretical framework will be seen in the perspective of Economic Theory of Games, which should not be confused with the Combinatorial Game Theory, initiated by Sprague (1935) in the 1930s. The first has predominantly economic motivations and seeks to establish methods to maximize the gain (payoff), while the second theory focuses on aspects of table games (e.g., card game).

According to Osborne & Rubinstein (1994), Game Theory is a set of analytical techniques designed to aid the understanding of observed phenomena when decision makers or players interact with each other.

Thus, game theory is the study of the means in which strategic interactions between rational players produce payoffs related to the preferences of each player. Such preferences are utility calls.

This theory is based on the principle of instrumental rationality with which players seek the best results for themselves or for their group. This works on the assumption that players are endowed with a perfect rationality (strong rationality).

Thus, it is intended to seek forms to examine ways to achieve the desired ends. The application of Game Theory can be of great relevance to fields of study in which the social element exerts influence.

Morgenstern (1944), one of the precursors of game theory, states that this theory is a new matter, which aroused great interest because of its novel mathematical properties and its multiple applications to social, economic and political areas. Its effects on social sciences have also been expressed over a broad spectrum. Its applications are numerous and refer to significant issues for social scientists because the mathematical structure of the theory profoundly differs from previous attempts to provide mathematical foundation to social phenomena.

Since its inception, it has a wide application because focuses on decision problems of the participants, it allows to make predictions on the behavior of the players and also features likely

outcomes. Thus, the insights provided by this theory contribute significantly to the understanding and comprehension of the strategic cooperation and the formation of strategic alliances.

### 3.2 Partnership

The global scenario has undergone changes in economic and social order that affect the market and, also and significantly, industries. At the current juncture, it is observed the advance of globalization, the high interdependence in the economic sector and the dynamism of markets.

However, this highly competitive posture does not provide the same kind of results as it happened few years ago. Organizations have no longer any direct resources being enough to the success of their business; and thus the formation of strategic alliances is gaining strength as a strategic posture in the economic scenario.

The concept of strategic alliances is difficult to elaborate, because there is a wide range of possible relationships between organizations. According to Yoshino and Rangan (1996, p.5), a strategic alliance is some kind of a business partnership that increases the effectiveness of the competitive strategies of the participating organizations, providing mutual and beneficial exchange of technologies, skills and products based on that.

This concept has the idea of mutual benefit. As participants increase their skills work cooperatively. However, this concept is still limited by stating that a strategic partnership is a business partnership. Reasons for the formation of an alliance and the interests of partners involve, in most cases, commercial interests, even if the various interests are not shown explicitly.

According to Abbade (2010), there are three characteristics which must be met:

- Two or more companies that come together to meet a number of combined goals remain independent after the formation of the alliance;
- Partner companies share the benefits of the alliance and control the performance of specified tasks, perhaps the most distinctive feature of alliances and makes it very difficult to manage;
- Business partner continually contribute with one or more key strategic areas.

As Parkhe (1993) states, strategic alliances are voluntary agreements of interorganizational

cooperation often characterized by inherent instability caused by the uncertainty related to the partner's future behavior and by applying a high level of authority to ensure the commitment. This high level of authority is related to the governance structure.

Contractor and Lorange (1988) define strategic alliances from the degree of interdependence between the organizations involved. The degree of interdependence can vary between high and low. In a high degree of interdependence, the reversal of partnership would be more difficult due to the high existing degree of dependence among parties. In a low degree of interdependence, the reversal of alliance could occur more easily. The degree of interdependence is an important parameter that should be considered during the partner selection process.

According to Lewis (1992), alliances provide unique opportunities for the development of force with an exceptionally wide range of partners, such as manufacturers, retailers, competitors, academic centres and other companies of any nature.

Faulkner and Rond (2000) consider that the term "alliance" that at some time in the past meant a clearly defined relationship between particular companies, today it is used as a "umbrella" term to give a feature of a wide range of relationships among companies.

According Noletto (2000), when companies realize that their competitors have competitive advantages, they are motivated to partnership establishments since they find that it is advantageous for them by joining efforts in order to optimize mutual resources and expertising.

#### **4. Business Partnership – The Model**

The supra mentioned researcher's experience that was gained through many years of working with business partners enabled the development of a model that reflects the real business situations on partnership in the Information Technology sector.

Throughout this article a set of considerations were developed and some applied cases were presented to the concrete study of companies in the IT sector. Successively the market was observed and a companies' positioning analysis was made, working theoretical foundations in the context that was surveyed.

The model definition will be presented, defining some variables that will make up the model. The

object of research was also presented as its suitability. Some analogies and studies related to this model and under this model are also presented.

This model aims to answer the following questions:

- Partnership is recommended to companies under investigation?
- If partnership is made, how would be the participation (in percentage terms) of each business partner in the project?

In the construction of the model, the work developed in Albuquerque (2010) was used as the research base. There factors that contribute to the sustainable growth of information technology companies were studied, i.e. skill, local presence and relationship. These factors are the variables of this model.

From the survey results applied to customers in Albuquerque (2010), a normalization to 100% (one hundred percent) for factors is made (for skill, local presence and relationship).

#### **Models Variables**

The model consists of questions to each one of the supra mentioned factors: skill, local presence and partnership (see below the definition of variables). These factors will be the variables of the model.

##### **Skill**

Question 01: The business partner has the technical capacity to deliver 100% of the information technology project? If not, what is the percentage of the estimated delivery capacity for the solution?

Possible answers in percentages: 0%, 25%, 50%, 75%, and 100%

##### **Local Presence**

Question 01: The business partner has a commercial office in the country place of the contracting company?

Answer: Yes = 100% and No = 0%

##### **Relationship**

Question 01: The business partner personally knows the person who makes the decision in relation to the information technology project contractor?

Answer (\*): Yes = 50% and No = 0%

Question 02: The business partner has a good business relationship with the person who makes the

decision in relation to information technology project contractor?

Answer (\*): Yes = 50% and No = 0%

(\*) The weight is considered in this way to model methodological issues, by considering two questions for the same item.

For purposes of this study, based on responses to each question, it was drawn up the following table comparing the skill factors, local presence and relationship, which allowed to calculate the relationship among the factors that influence the partnership.

**Table 01:** Comparative model among the factors that influence the partnership

	Business Partner 01 (%)	Business Partner 02 (%)	
<b>SKILL</b>			
Question 01	100	50	(0%; 25%; 50%; 75%; 100%)
	56	28	
<b>TOTAL : SKILL</b>	<b>56</b>	<b>28</b>	(%)
<b>LOCAL PRESENCE</b>			
Question 02	100	100	(YES = 100 e NO = 0)
	9	9	
<b>RELATIONSHIP</b>			
Question 01	0	50	(YES = 50 e NO = 0)
Question 02	0	50	(YES = 50 e NO = 0)
Sum	0	100	
	35	35	
<b>TOTAL : LOCAL PRESENCE + RELATIONSHIP</b>	<b>44</b>	<b>44</b>	(%)

Source: Authors' calculations.

In this model, the results are as follow:

- Skill factor - the business partner 01 has the capacity to deliver 100% of the required solution, while the business partner 02 has limited capacity to deliver only 50% of the required solution.

About the factors local presence and relationship, it is observed that:

- Local presence - the business partner has 01 commercial office in the country of the contracting company. This position is the same at the business partner 02 who also has a commercial office in the country of the contracting company.

- Relationship Factor - the business partner 01 despite having offices in the headquarters of the contracting company, does not know personally the person who makes the decision regarding the IT project therefore does not establish any business relationship. But the business partner 02 personally knows and has a business relationship with the person who makes the

decision in relation to the contracting company's IT project.

Since the master's thesis in Albuquerque (2010), the authors have been developing this model in the market, being applied strategically in the management of partnerships in the IT company where one of the researchers works already for many years. This model has already had much recognition and merit assigned considering the results it has achieved with its use.

### 5. Game of Partnership – Dilemma of Business Partner

In situations of conflict, involving two or more business partners, it is common to consider a question about the best strategy to be followed by each company once there is a dilemma always present in organizations: competing or cooperating?

The Game of Partnership - Dilemma of the Business Partners will be presented. It analyses the applicability of the two ways: is it more advantageous to compete at the risk of losing or winning, or even, the best alternative is the adoption of a policy of cooperation between the business partners?

It should be clarified that table for the game of Partnership (which will be presented below), was prepared from the above table data. In this analysis, some factors considered as variables of the model will be used.

- Skill;
- Local presence + Relationship.

**Table 02:** Game of Partnership - Dilemma of the Business Partners

		Business Partner 02	
FACTORS OF PARTNERSHIP		SKILL	LOCAL PRESENCE + RELATIONSHIP
Business Partner 01	SKILL	( 56 , 28 )	( 56 , 44 )
	LOCAL PRESENCE + RELATIONSHIP	( 9 , 28 )	( 9 , 44 )

Source: Authors' calculations

Business partners have the same set of actions to play (factor “skill” and “local presence + relationship”), but their payoffs are different for each move as shown in the table above, which expresses the game question. The business partner 01 is

represented on the line and the business partner 02 is represented in the column.

Few are the games that have a balance of dominant strategies, such as the classic case in the literature of the Prisoner's Dilemma.

Now presented in this game, the business partner 01 has a dominant strategy as it is its skill. This strategy is strongly dominant compared to the skill factor of the Business Partner 02 and weakly dominant factor as the local presence + relationship.

The business partner 02 has a strongly dominant strategy as the local presence factor + relationship in relation to the business partner 01 and its strategy is strongly dominant compared to the skill factor and also to factor local presence + relationship.

The combination of strategies (skill, local presence + relationship) is a balancing dominant strategies that seems to have grip with reality and involves business partners.

## 6. Results

In this study, it was intended to move towards and propose solutions for the management of situations involving conflicts in the information technology sector. This results knowledge from the experience gained by one of the researchers, who has developed a model within the company where he works.

In addition, this paper's development resulted as a unique opportunity to bring to the Academy the experience obtained in the business reality. Managing conflict situations which exist in the day to day life results a very interesting way proposed by this model for the management area of companies in the market and on competition in front of business in this very competitive industry.

Such a situation of conflict, very interesting from the academic point of view and scientific research, is a source of relevant modelling being possible to bring it to analysis and theoretical foundation.

The possibility of creating a situation arising from the use of Game Theory and Quantitative Methods proved to be rewarding with the results obtained from the study, which are very clear and defined. Thus, not only the cooperation gains function as a logical consequence of the results for games in such situations, as it can be extended to other types of modelling.

It must be emphasized that the existence of clear rules makes possible the emergence of a climate of trust among the participants of the game, who are willing to comply with them (the rules).

In the analysed situation (the Information Technology sector in Brazil), it is necessary to define the conditions of the process of partnership in order to find alliance strategies between potential business partners; to enable cooperation gains resulting from such partnerships; and also to generate efficiency gains and productivity.

## 7. Conclusions

At the present juncture, the advance of globalization, interdependence in the economic sector and the dynamism of markets contribute to the emergence of a competitive scenario which results are different from those obtained 20 years ago. Companies have not enough resources to the success of their businesses, so they need to establish strategic alliances in order to remain in these competitively markets.

Several factors lead the business partners working together, considering that some relationships are better suited to the objectives previously determined than others. Even in the partnership process, there is the possibility of conflict, which justifies the application of game theory, and the analysis of formation of strategic alliances.

This theory, based on mathematical analysis, enables the analysis and interpretation of real situations of conflicts in the negotiation process.

Such conflicts are similar to a game in which the following elements are present: availability of information, decision-making, positioning and actions of the players, the adoption of strategies, results and equilibrium.

The use of this theory enabled the researcher to perceive and to analyse the strategies of each player and the key motivational forces for the formation of this type of cooperative relationship in the case studied.

In situations of conflict, involving two or more business partners, a common question may be posed: which is the best strategy to be followed by each company, as there is a dilemma always present in organizations, competing or cooperating. In this paper, the applicability of the two ways was analysed: when it is most advantageous to compete at the risk of losing or winning; or when a better

alternative is to adopt a policy of cooperation between business partners.

The Mechanism design theory also was used. According to the literature, a game may be based on a mechanism on which a player can set his own strategies. A mechanism consists on rules for the game and shall be developed in order to achieve this purpose, so decisions must be taken in accordance with the interests of each player. The player who draws the mechanism should consider his exercising influence over other players, therefore his expectations need to be reasonable, and otherwise other players will not accept the game.

In this situation, the establishment of rules dictated by the manufacturer / business regulator for distribution of hardware (equipment) and software (programs), the provision of services and the existence of cooperation determines the benefits to participants throughout the process. For this, it is essential that there is a climate of trust, to ensure every player that the rules are complied with.

In constructing the model, which occurred from the factors skill, local presence and relationships was elaborated a comparative table, which was assigned a weight to each factor in relation to the business partner's positioning and its client, the game (project) in progress.

In the model, the factors skill, local presence and relationship entered as variables. It was possible to estimate the payoffs of each player. Such factors are quantifiable variables and somehow are identified without great difficulty. Such features make this model a simple and objective alternative to the analysis and decision making regarding the partnership in situations of conflict involving business partners in the IT industry.

The experience gained through years of working with business partners made one of the researchers able to model real situations of experienced business in the information technology sector.

The work carried out, which consisted in the application of game theory to business partners, has enabled the understanding of partnership as a factor that contributes to the sustainable growth of information technology companies in Brazil as a benchmark for other organizations or future research.

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