



# THE HIERARCHICAL LEVEL OF DECISION MAKERS INFLUENCES THE LEVEL OF IMPORTANCE OF IT OUTSOURCING DECISION ASPECTS? A SURVEY WITH BRAZILIAN IT PROFESSIONALS.

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*The outsourcing movement is growing in all sectors of the economy, mainly in the Information Technology (IT) services area. Therefore, researches concerning the aspects related to IT outsourcing decisions are an important knowledge to be developed. Revising the literature it was possible to verify the prevalence of six decisions aspects in IT outsourcing decisions. Some authors demonstrated that professionals in high hierarchical levels have a different management style than professionals in low hierarchical levels. The purpose of this study is to understand whether the hierarchical level of decision makers influences the level of importance of IT outsourcing decision aspects that are described in the literature. This paper also tries to find out the level of importance attributed to the decisions aspects by each hierarchical level. The data collection method used in this research was survey. The study used descriptive statistics and non-parametric statistics to evaluate the collected data. The results of this research show that there is no evidence of influence of hierarchical level of decision makers over the level of importance of IT outsourcing decision making aspects. Comparison with other works and suggestions of future researches are also presented in conclusion.*

*Keywords: Information Technology (IT), IT Outsourcing, Hierarchical Level, Decision Making, Survey, Non-parametric Statistics*

## 1. Introduction

The outsourcing movement is growing in all sectors of the economy, mainly in the Information Technology (IT) services area. In Brazil, the number of IT outsourced workstations increased by 127% in 10 years (Portal Exame, 2006). The increase in external workstations is related to the fact that companies are outsourcing their IT activities more than ever. For this reason, it is very important to study and to understand this movement and its consequences, mainly in countries where it is notably increasing. IT outsourcing has been used by companies over the last 50 years and has been researched by the academy since then (Vassiliadis et al, 2006). The decision to outsource IT has been an important focus in IT research and practice. In the last three years, the decision to switch vendors or to backsource has gained the interest of the academy (Whitten and Leidner, 2006). Therefore, researches concerning the aspects related to IT outsourcing decisions are an important knowledge to be developed.

Oshagbemi and Gill (2004) demonstrated that professionals in high hierarchical levels have a different management style than professionals in low hierarchical levels. Therefore, this study is intended to contribute with the IT outsourcing decision making knowledge, verifying the issue of difference in management style demonstrated by Oshagbemi and Gill (2004). In other words, the purpose of this study is to understand whether the hierarchical level of decision makers influences the level of importance of IT outsourcing decision aspects that are described in the literature. In case they do, this paper tries to find out the level of importance attributed to each hierarchical level. The level of importance of IT outsourcing decision aspects will be evaluated through the perspective of the companies and of the professionals. Hence, those perspectives will be considered in the research question.

In order to achieve that purpose, this study will research the literature that covers IT outsourcing to address the aspects considered by the companies in an IT outsourcing decision. Later, the study will research, through a survey, IT professionals and their companies to evaluate if the hierarchical level of decision makers influences the level of importance of each proposed aspect found in the literature, considering both mentioned perspectives. The data received by the survey will be statistically analyzed and discussed. The study is then finalized with the conclusions, the study limitations, and suggestions for future research.

## 2. Aspects involved in IT outsourcing decisions

The decision to outsource IT functions is considered by Olson (2004) as one of the main strategic decisions. Strategic decisions are those that involve the commitment of a large number of organizational resources for attaining goals (Lacity and Willcocks, 1998). As a result, strategic decisions change a series of organizational aspects and functions; and also influence the direction the company will take. Strategic decisions also change organizational management and structure (Paisittanand and Olson, 2005). For being a strategic decision, the evaluation of the outsourcing decision contains other components. Revising the literature that covers this theme, it was possible to verify the prevalence of some aspects in IT outsourcing decisions. These aspects are presented below:

**Strategic issues:** This aspect concerns the benefits incurred with the construction of alliances between the customer and the outsourcing supplier. Some examples of these benefits are: use of suppliers' innovations and professional capacities; possibility of fast market changes and technological scenarios, etc. (Lacity and Hirschheim, 1993; Quinn and Hilmer, 1994; McFarlan and Nolan, 1995; DiRomualdo and Gurbaxani, 1998; and Lonsdale and Cox, 2000).

**Costs:** This subject approaches not only the details related to outsourcing costs, but also collects issues related to "hidden" costs; in other words, the costs incurred with the contract management. Transactional costs concepts can be applied to this specific point (Lacity and Hirschheim, 1993; Quinn and Hilmer, 1994; DiRomualdo and Gurbaxani, 1998; Lonsdale and Cox, 2000; Barthelemy, 2001; and Aubert et al, 2004).

**New management forms:** The choice of outsourcing necessarily implies changes in management style of the IT function. Before outsourcing, the people involved in the operation of the area have technical abilities to guarantee the service operation. After outsourcing, the involved people's abilities change from technical to managerial. Besides, outsourcing can bring strategic and new businesses impacts (Quinn and Hilmer, 1994; and Venkatraman, 1997).

**Risks:** The outsourcing risks have a direct relationship with the other aspects discussed in this text. For instance, the hidden costs of an outsourcing process are directly related to failure risks. In the same way, the loss of information privacy and safety, in addition to the loss of IT technical experience seems to be quite related to the strategic issues aspect. Besides, the risks can be linked to the decision process and with the outsourcing scope (Lacity and Hirschheim, 1993; Quinn and Hilmer, 1994; Earl, 1996; and Tafti, 2005).

**Contracts:** Outsourcing contracts discuss the points that allow a long-lasting relationship between the parts. In other words, the contract should: guarantee a strategic alliance among the parts; allow the customers to have access to the technical knowledge of the supplier; possess a very defined measure system so that the performance of the delivered service can be constantly evaluated; determine growth ratios and be adjusted to business changes; and so on. (Lacity and Hirschheim, 1993; Quinn and Hilmer, 1994; McFarlan and Nolan, 1995; DiRomualdo and Gurbaxani, 1998; and Lonsdale and Cox, 2000).

**Benchmarking:** Covers the study of similar cases accomplished by other companies or is described in the literature. Also, it can provide a differentiated vision on the process as a whole, facilitating decision taking (Huber, 1993; Lacity and Hirschheim, 1993; Arnett and Jones, 1994; Quinn and Hilmer, 1994; Cross, 1995; Hurley and Shaumann, 1997; DiRomualdo and Gurbaxani, 1998; and Lonsdale and Cox, 2000).

### 3. Variables used in the study

In table 1, there is a list of the variables used in the study, the description, the code and possible values.

| Description  | Code | Values   |
|--|------|--|
| Professionals hierarchical level                         | A1   | 1= Low<br>2= Medium<br>3= High   |
| Strategic issues importance in companies context         | B1   | 1= Not important<br>2= Less important<br>3= Important<br>4= Very important |
| Costs importance in companies context                    | B2   |  |
| New management forms importance in companies context     | B3   |  |
| Risks importance in companies context                    | B4   |  |
| Contracts importance in companies context                | B5   |  |
| Benchmark importance in companies context                | B6   |  |
| Strategic issues importance in professionals opinion     | C1   | 1= Not important<br>2= Less important<br>3= Important<br>4= Very important |
| Costs importance in professionals opinion                | C2   |  |
| New management forms importance in professionals opinion | C3   |  |
| Risks importance in professionals opinion                | C4   |  |
| Contracts importance in professionals opinion            | C5   |  |
| Benchmark importance in professionals opinion            | C6   |  |

Table 1 - Variables used in statistical analysis

#### 4. Methodology

The data collection method used in this research was survey. According to Forza (2002), survey can be used as a research method for exploratory studies. The methodology used in this study follows, in general lines, the steps also proposed by Forza (2002). Firstly, this study sought the establishment of a link between theory and the issues researched by the study. This was made in the first part of the paper, by presenting the constructs used in this research, as well as the variables used.

The restrictions to which this study is subjected were evaluated. Among all the restrictions in question, time is the most relevant. Due to this restriction, the analysis of collected data had to follow a methodology so that conclusions could be drawn. It means that, due to time restriction, the collected data will not be reworked (complemented or adjusted), in case this is needed. Therefore, complementary statistical methods will be used to draw the conclusions. A description of these methods will be presented later.

Having the information on the data that needed to be collected, the next step is the form of development process used for data collection. This form is composed of 13 questions divided into three groups. The first group covers the information gathering for contact. The second group covers company's information. The third group is intended to verify the consideration of the discussed aspects, as well as the determination of the importance level of these aspects in agreement with the context of the researched companies. It is important to emphasize that this third group handles only the gathering of information related to the dependent variables analyzed in this study. To properly answer the questions belonging to this third group, each of the six aspects mentioned was detailed through the use of a table. The respondents were required to understand the description of the aspects before answering the questions.

The form was validated by two IT professionals with wide experience in the outsourcing theme (an IT manager of an electric power generation company and an IT director of a telecommunications company), in agreement with the recommendations presented by Forza (2002). The main aspect highlighted by these two professionals was the clarity of the form in respect to the gathering of the necessary information. After these two professionals' evaluation, the form was remodeled and sent to the respondents.

The form was sent to approximately 400 IT professionals. 223 are IT professionals close to the study group that developed this research. The remaining of those researched are part of two IT discussion groups in the Internet. Of the forms sent, only 30 forms were answered in four calls. The second request for participation had a higher answer ratio than the first. Due to the time restriction imposed on this research, it was not possible to send a new participation request and the data obtained with the answers are a convenience sample (Triola, 1999). Tables 3, 4 and 5 present information on the collected data.

The research method used in this study is composed by three steps to analyze the collected data. First, the study evaluated the reliability of the measure tool. According to Forza (2002), reliability indicates dependability, stability, predictability, consistency and accuracy, and refers to the extent to which a measuring procedure yields the same results in repeated trials. Reliability can be assessed in four different ways: test-related method; alternative form method; split halves method; and internal consistency method. This study used internal consistency method by calculating Cronbach's  $\alpha$ , which is the most popular test for internal consistence used. Second, the study used descriptive statistics. Descriptive statistics can be considered methods that present and describe tables and graphs, which could be used in several types of studies, as in exploratory studies (Triola, 1999). The analysis through descriptive statistics used tables to present mean, standard error mean, standard deviation, minimum and maximum values of the levels of importance of each aspect. Finally, the study

used non-parametric statistics to evaluate if the importance level of each of the six aspects proposed can be influenced by the hierarchical level of the decision making professionals. The choice of non-parametric test is related to the little sample problem and to the unawareness of variable distributions. Non-parametric tests can deal with those problems (Triola, 1999). The non-parametric statistics will be applied on professional's opinion and on companies evaluation requirements. Firstly, this test will evaluate whether there is some difference between the companies evaluation requirements and the professional's opinion. Then this test will evaluate if the hierarchical level will exert some influence over the importance level of each aspect for companies requirements and for professional's opinion. The non-parametric tests used in this study are 1-Sample Wilcoxon, to compare differences between two aspects, and Kruskal-Wallis, to compare differences between three or more aspects.

| Hierarchical level | Low    | Medium | High   |
|--------------------|--------|--------|--------|
| Respondents        | 34.48% | 41.38% | 24.14% |

Table 3 – Proportion of respondents according their hierarchical level

| By the companies     | Not important | Less important | Important | Very important |
|----------------------|---------------|----------------|-----------|----------------|
| Strategic issues     | 3.45%         | 17.24%         | 31.03%    | 48.28%         |
| Costs                | 0.00%         | 17.24%         | 27.59%    | 55.17%         |
| New management forms | 20.69%        | 34.48%         | 41.38%    | 3.45%          |
| Risks                | 3.45%         | 34.48%         | 44.83%    | 17.24%         |
| Contracts            | 10.34%        | 27.59%         | 37.93%    | 24.14%         |
| Benchmarking         | 27.59%        | 48.28%         | 17.24%    | 6.90%          |

Table 4 – Level of importance required by the companies

| By the professionals | Not important | Less important | Important | Very important |
|----------------------|---------------|----------------|-----------|----------------|
| Strategic issues     | 3.45%         | 10.34%         | 24.14%    | 62.07%         |
| Costs                | 0.00%         | 31.03%         | 27.59%    | 41.38%         |
| New management forms | 10.34%        | 24.14%         | 37.93%    | 27.59%         |
| Risks                | 0.00%         | 10.34%         | 55.17%    | 34.48%         |
| Contracts            | 10.34%        | 10.34%         | 20.69%    | 58.62%         |
| Benchmarking         | 10.34%        | 58.62%         | 20.69%    | 10.34%         |

Table 5 – Level of importance considered by the professionals

## 5. Data presentation and discussion

The output for the internal consistency test for the measuring procedure used by this study shows the value of 0.761 for Cronbach's  $\alpha$ . According to Forza (2002), if  $\alpha \geq 0.6$  the measure can be accepted. However,  $\alpha \geq 0.7$  should be the threshold and  $\alpha \geq 0.8$  shows that the measure instrument is very reliable. Therefore, the value of 0.761 shows that the measure instrument used by this study is valid and the information that will be presented later is, to some extent, reliable. By granting the reliability of the measure instrument, it is possible evaluate the data obtained in the responded forms.

The first analysis relied on descriptive statistics to show the importance level mean of each decision making aspect according to the hierarchical level of the professionals researched and the companies requirements and professionals' opinion. Table 6 shows the mean, standard error of the mean, standard deviation, minimum and maximum values. The evaluation of table 6 shows important information that could guide the rest of the analysis. For example, by

analyzing strategic issues aspect it can be concluded that the companies expected the evaluation of such aspect to increase in importance in accordance with the hierarchical level increase of their professionals. However, in professional's opinion low and high hierarchical levels, professionals seem to demonstrate the same level of importance for strategic issues aspects, while medium hierarchical level professionals seem to be less sensitive to the evaluation of that aspect. By analyzing this example, it can be concluded that for companies, the evaluation of strategic issues aspects is influenced by the hierarchical level of the decision making professional. However, for professionals, such influence has another characteristic. Although such analysis can be made for each aspect, it is not conclusive. Seeking reliable conclusions, deriving from the information presented in table 6, the research will rely on non-parametric statistics.

| Hierarchical level | Context              | Variable             | Mean  | SE Mean | StDev | Min | Max |
|--------------------|----------------------|----------------------|-------|---------|-------|-----|-----|
| Low                | Companies            | Strategic issues     | 4.1   | 0.233   | 0.738 | 3   | 5   |
|                    |                      | Costs                | 4.6   | 0.221   | 0.699 | 3   | 5   |
|                    |                      | New management forms | 3.3   | 0.26    | 0.823 | 2   | 4   |
|                    |                      | Risks                | 3.6   | 0.267   | 0.843 | 2   | 5   |
|                    |                      | Contracts            | 4     | 0.258   | 0.816 | 3   | 5   |
|                    | Professionals        | Benchmarking         | 2.9   | 0.277   | 0.876 | 2   | 4   |
|                    |                      | Strategic issues     | 4.8   | 0.133   | 0.422 | 4   | 5   |
|                    |                      | Costs                | 4.2   | 0.291   | 0.919 | 3   | 5   |
|                    |                      | New management forms | 4     | 0.258   | 0.816 | 3   | 5   |
|                    |                      | Risks                | 4.4   | 0.163   | 0.516 | 4   | 5   |
| Medium             | Companies            | Contracts            | 4.6   | 0.221   | 0.699 | 3   | 5   |
|                    |                      | Benchmarking         | 3.6   | 0.221   | 0.699 | 3   | 5   |
|                    |                      | Strategic issues     | 4.25  | 0.305   | 1.055 | 2   | 5   |
|                    |                      | Costs                | 4.083 | 0.229   | 0.793 | 3   | 5   |
|                    |                      | New management forms | 3.167 | 0.241   | 0.835 | 2   | 4   |
|                    | Professionals        | Risks                | 4     | 0.213   | 0.739 | 3   | 5   |
|                    |                      | Contracts            | 3.5   | 0.289   | 1     | 2   | 5   |
|                    |                      | Benchmarking         | 3.25  | 0.218   | 0.754 | 2   | 5   |
|                    |                      | Strategic issues     | 3.917 | 0.288   | 0.996 | 2   | 5   |
|                    |                      | Costs                | 4.083 | 0.26    | 0.9   | 3   | 5   |
| High               | Companies            | New management forms | 3.667 | 0.31    | 1.073 | 2   | 5   |
|                    |                      | Risks                | 4.25  | 0.218   | 0.754 | 3   | 5   |
|                    |                      | Contracts            | 4.083 | 0.336   | 1.165 | 2   | 5   |
|                    |                      | Benchmarking         | 3.083 | 0.229   | 0.793 | 2   | 5   |
|                    |                      | Strategic issues     | 4.429 | 0.297   | 0.787 | 3   | 5   |
|                    | Professionals        | Costs                | 4.571 | 0.297   | 0.787 | 3   | 5   |
|                    |                      | New management forms | 3.429 | 0.369   | 0.976 | 2   | 5   |
|                    |                      | Risks                | 3.571 | 0.297   | 0.787 | 3   | 5   |
|                    |                      | Contracts            | 3.857 | 0.404   | 1.069 | 2   | 5   |
|                    |                      | Benchmarking         | 2.857 | 0.404   | 1.069 | 2   | 5   |
| Professionals      | Strategic issues     | 4.857                | 0.143 | 0.378   | 4     | 5   |     |
|                    | Costs                | 4                    | 0.309 | 0.816   | 3     | 5   |     |
|                    | New management forms | 3.857                | 0.404 | 1.069   | 2     | 5   |     |
|                    | Risks                | 4                    | 0.218 | 0.577   | 3     | 5   |     |
|                    | Contracts            | 4.143                | 0.459 | 1.215   | 2     | 5   |     |
|                    |                      | Benchmarking         | 3.286 | 0.36    | 0.951 | 2   | 5   |

Table 6 – Descriptive statistics for each aspect according the hierarchical level, companies requirements and professional's opinion

The first non-parametric test is 1-Sample Wilcoxon to compare if there is some difference between companies requirements and professional's opinion. If there is not a difference between the evaluation of these two perspectives, the analysis could be made over one of the samples, otherwise the analysis should consider each perspective separately. Table 7 shows the results of 1-Sample Wilcoxon for each aspect. The null hypothesis for this test is there is no difference between the importance levels considered by both perspectives. Therefore, P-values equal to or smaller than 0.05 show that companies requirements and professional's opinion are different. Only strategic issues aspects have the same importance for both companies and professionals. Therefore, each decision making aspect should be evaluated according to companies requirement and professional's opinion.

| <b>Companies versus Professionals</b> | <b>N</b> | <b>N for Test</b> | <b>Wilcoxon Statistic</b> | <b>P</b> |
|---------------------------------------|----------|-------------------|---------------------------|----------|
| Strategic issues                      | 29       | 13                | 28.5                      | 0.249    |
| Costs                                 | 29       | 8                 | 32.5                      | 0.05     |
| New management forms                  | 29       | 19                | 24                        | 0.005    |
| Risks                                 | 29       | 15                | 13                        | 0.008    |
| Contracts                             | 29       | 12                | 0                         | 0.003    |
| Benchmarking                          | 29       | 13                | 0                         | 0.002    |

Table 7 – Wilcoxon test comparing each aspect on companies versus professional's perspective

The next test is Kruskal-Wallis, comparing whether there is some difference between the importance level considered by each hierarchical level. The null hypothesis tested is that the importance level considered by each hierarchical level is equal. Therefore, P-values higher than 0.05 confirm the null hypothesis. The test for all six aspects considering companies and professional's perspective jointly shows that there is no evidence of difference between the levels of importance evaluated by the three hierarchical levels (P-value equal to 0.607). The test for all six aspects considering companies and professional's perspective separately shows that there is no evidence of difference between the levels of importance evaluated by the three hierarchical levels (P-value equal to 0.218 and 0.94 respectively). Table 8 shows Kruskal-Wallis test results (P-values) for the importance level considered by the three hierarchical levels of each aspect according to the perspective of the companies and of the professionals. It must be noticed that all values of P presented by Kruskal-Wallis test are higher than 0.05 except for the strategic issues aspect in professional's opinion. Therefore, it could be concluded that there is no evidence that the hierarchical level of professionals' decision making influences the importance level of each of the proposed decision making aspects. It can be noticed that table 2 shows different information. Kruskal-Wallis test compares the variance of the samples. Although table 2 shows differences in importance level mean, the results presented in table 8 show that the differences between the variances of each hierarchical level are not statistically significant. Hence, the results presented in table 8 are more reliable than the information presented in table 2.

| <b>Decision Making Aspects</b> | <b>Companies</b> | <b>Professionals</b> |
|--------------------------------|------------------|----------------------|
| Strategic issues               | 0.609            | 0.016                |
| Costs                          | 0.181            | 0.887                |
| New management forms           | 0.832            | 0.785                |
| Risks                          | 0.384            | 0.444                |
| Contracts                      | 0.497            | 0.544                |
| Benchmarking                   | 0.413            | 0.222                |

Table 8 - Kruskal-Wallis test results (P-values) for the importance level considered by the hierarchical levels

The final analysis of this research is to evaluate the existence of difference between the importance levels considered by each hierarchical level for group of decision aspects. Table 9 presents groups of decision aspects according to the perspective of the companies and of the professionals. This table is a result of the organization of the importance mean presented in table 2. After this organization, the groups were submitted to 1-Sample Wilcoxon and Kruskal-Wallis tests to confirm differences between them. In the perspective of the companies, the 1-Sampel Wilcoxon test shows the respective P-values for strategic issues versus costs, risks versus contracts and new management forms versus benchmarking: 0.573; 0.965 and 0.244. The 1-Sample Wilcoxon test shows the respective P-values for group 1 versus 2, group 1 versus 3 and group 2 versus 3: 0.003; 0 and 0. This result confirms that the importance level of the decision aspects in each group is not statistically different but the importance level of the decision aspects of each group is statistically different. Related to professional's perspective, Kruskal-Wallis test shows that there is no difference between the levels of importance of strategic issues, contracts, risks and costs aspects for each hierarchical level (P-value equal to 0,287). However, there is a significant difference between the level of importance of group 1 versus 2, group 1 versus 3 and group 2 versus 3 (1-Sampel Wilcoxon P-values are less than 0.05 for all comparisons). The values presented prove the validity of table 9. Although the decisions aspects could be grouped, the hypothesis that the hierarchical level influences the importance evaluation of the decision aspects is still rejected.

| Perspective   | Group                | Hierarchical Level   |                      |                      |
|---------------|----------------------|----------------------|----------------------|----------------------|
|               |                      | Low                  | Medium               | High                 |
| Companies     | 1                    | Costs                | Strategic issues     | Costs                |
|               |                      | Strategic issues     | Costs                | Strategic issues     |
|               |                      | Contracts            | Risks                | Contracts            |
|               | 2                    | Risks                | Contracts            | Risks                |
|               |                      | New management forms | Benchmarking         | New management forms |
|               |                      | Benchmarking         | New management forms | Benchmarking         |
|               | 3                    | Strategic issues     | Risks                | Strategic issues     |
|               |                      | Contracts            | Costs                | Contracts            |
|               |                      | Risks                | Contracts            | Costs                |
| Professionals | 1                    | Costs                | Strategic issues     | Risks                |
|               |                      | New management forms | New management forms | New management forms |
|               |                      | Benchmarking         | Benchmarking         | Benchmarking         |
|               | 2                    | Benchmarking         | Benchmarking         | Benchmarking         |
|               |                      | New management forms | New management forms | New management forms |
|               |                      | Contracts            | Costs                | Contracts            |
| 3             | Risks                | Contracts            | Costs                |                      |
|               | Costs                | Strategic issues     | Risks                |                      |
|               | New management forms | New management forms | New management forms |                      |

Table 9 – Groups of decision aspects according to the perspective of the companies and of the professionals

It must be noticed that although the mean level of importance of decision aspects shows differences over the hierarchical levels in the companies and professional's perspective (clearly presented in table 9), they are not statistically significant. Therefore, there is no evidence to argue that hierarchical level influences the importance level of each IT outsourcing decision aspect, or the group of aspects presented in table 9. This conclusion can be drawn and validated by the statistical tests presented earlier.

## 6. Conclusions and future works

The results of this research show that there is no evidence of influence of hierarchical level of decision makers over the level of importance of IT outsourcing decision making aspects. This lack of evidence can be found both in the professional's opinion and in the companies requirements, although there are significant differences between the level of importance of five of the six aspects in these two perspectives.



Comparing this conclusion with the research of Oshagbemi and Gill (2004) it can be proposed that management style is not related to decision making evaluation. Future researches on IT outsourcing decision making can explore this issue. Following this line of thought, future researches of IT outsourcing decision can evaluate which factors really influence in the level of importance of decision making aspects.

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