INFORMATION TECHNOLOGY: SUBCONTRACTING OF DEVELOPMENT PROCESSES

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ABSTRACT

Information technology, globalization, competition is changing managerial strategies all over the World. Ecommerce, E business, virtual enterprises, Electronic Data Interchange – EDI, Internet and intranet, business on line, are a couple of expressions which are putting too much pressure on the shoulders of enterprises located in the Third World. In underdeveloped regions, anxiety for modernization can lead a large number of Companies to alienate what should be the essence of the existence, the core of their businesses: specific know-how vital for their survival. This paper deals with the notion that subcontracting must have a logistical and strategic planning approach. Subcontracting without planning can lead many companies to disappear as an independent entity, since they have subcontracted the essence of their technology: the information and the development processes. So, the paper main objective is to analyze subcontracting in information systems, and specially in the system development processes. Specific purposes can be specified as (i) to research methods and techniques of subcontracting the development systems in information technology; (ii) to verify the strategies, plan and future visions behind the subcontracting processes in Public and Private Corporations in Ceara; (iii) to find out what are the strategies of the contractors, generally large Companies and also the strategies of those firms which are subcontracted. Methodologically, We have conducted interviews with major subcontractors in the State of Ceara – 15 in Public Sector and 11 private companies, Information Technology Institutes, Universities, Professional Associations and Trade and Commerce Council and so on. The interviews were made with Professionals of the area, discussing their agreements and disagreements with the main hypotheses of the research. As major findings, the research has come to striking conclusions: Companies in general are subcontracting processes they should never have done. Many Public Institutions do not have control on essential information they have subcontracted. They also complain the subcontracting is due to an absolute lack of trained personnel. Private Companies under the argument that subcontracting reduces costs, do not realize that sometimes their dependence on third partners are increasing. There is also a so-called danger of giving away the essence of their business: the know-how of strategic processes. Despite many fears that were even a hypothesis of this research subcontracting has gained momentum and virtually all Information Technology processes nowadays are left to the third partners.
INTRODUCTION:

Subcontracting is seen as a managerial strategy so that companies could concentrate their efforts and intelligence on the core activities, leaving the auxiliary ones to specialized partners that can better perform these tasks, giving better results for both the contractors and the subcontractors, hence called the third parties or partners. Since the nineties, Subcontracting in Information Technology (IT) has gained momentum and what is surprising, in a quite accelerated rhythm. Subcontracting in IT has become a reality and is seen as a strategic alternative for the companies, however the form as the process has been driven, especially in Systems Development, requires a serious analysis aimed at identifying the mistakes committed and successes obtained. The study intends to give an effective contribution to managers, professionals, universities, users of IT and community beneficiary of IT systems in giving guidelines to get better results in IT subcontracting processes, through the development of better quality products, competitive prices, high productivity, in awin-win strategy for contractors and subcontractors. Through a research undertaking among 15 companies, contracting the development of Information Systems and also 13 firms of contracted partners, the different visions of both groups are analyzed focusing on the subcontracting motivations, advantages, concerns, experiences, strategies and future plans. The research for its qualitative nature had a small sample, though well diversified and representative in terms of Companies size, economic activity and juridical nature. The results showed that so much beside contracting parties as of Third partners, there are many mistakes and risks, deserving a better planning, accompaniment and evaluation of the subcontracting processes in the search of benefits for both parts.

1.1. Subcontracting in the Development of Information Technology (IT) Systems: an historical perspective:

Subcontracting is a managerial technique to which the companies have been appealing with the intent of increasing its productivity and competitiveness in the market.

Subcontracting in IT has settled down in ways different from many other activities, which have been more mature in terms of experience such as maintenance, cleanliness, safety, transport and equipment repair. In the decades of 50 and 60, IT began its penetration in the great Brazilian companies, through a subcontracting process. The great vendors of computers at that time, IBM and Burroughs created structures, to assume not only IT systems, but also the production and management of information. Everything was accomplished in a subcontracted form in IBM and Burroughs’ very dependencies. Those vendors evolved and started to develop their customers’ technicians to assume IT functions. In a second moment the companies, in spite of quite high costs, were stimulated to set up their own CPD - Centers of Data Processing with rented computers, private owned or mixed equipment, always with the vendors’ technical consultancy. The vendors dictated the rules of the market, always motivating the changes for new equipment with more computational resources, besides they determine the whole process of personnel's training and the methods and tools for systems' development.

Soon afterwards, the big companies started to train and to qualify their own employees, getting to settling Training Centers, devoted to IT Systems' development, Vendors' courses were regarded as too much expensive and those carried on with internal instructors had the advantages of being adapted to the technological platforms and work methodologies of the companies and also use to taking into account the prevailing managerial culture.

The first university courses in Computer Science appeared in Brazil during the sixties and in Ceara at the of the seventies. That was the start of a new phase, that enabled the installation of the so-called Services Bureaus for Data Processing, setting a new competition between the newly created Services Centers and the Computers' vendors. The dependence on Computer's vendors was still very strong due to the high costs of computers. Many of the companies rented vendors’ (CPD’s), constituted of medium and big size computers, although the contracts consisted mainly to the blockage of computer hours, while other companies had already their own teams to develop and to produce their systems.
During the seventies and eighties with the development of technology, the minicomputers and soon after the microcomputers appeared. They contributed to desmystification of Computer Science, through a massive spread of processes, because the prices suffered a drastic reduction, making computers affordable for small companies, domestic houses and personal usage. This is known as the PC phase, that is the phase of the Personal Computer. During the seventies and beginning of the eighties, a great contingent of companies assumed IT as a vital function in their organizational structures. IT was considered a differential factor for market competitiveness. Its importance and also the need of preserving secret in information has made IT a strategic and also ‘non-subcontractable’ function, under the argument of a possible danger in losing the control of the company and its power. The costs to maintain their own teams and to develop them (to maintain them up-to-date technologically) in way to produce own solutions, however, were tangible, easily measurable and affordable. The benefits were already clear and they are still more intangible.

Professional training, Universities courses and drop in hardware prices, associated with the scattering of techniques and tools for the development of systems, produced a market boom in computer services with competitive prices and high quality: subcontracting turned then into an alternative for the companies. In the decade of 90, subcontracting has increased at fast pace. Companies have been adopted this option motivated by a series of factors standing out: the reduction of costs, faster access to new technologies, the agility in the solutions, structural reengineering. The form, however, as the process has been driven, especially in the area of IT development of systems, requests an analysis aimed at identifying advantages and disadvantages, involved risks, critical factors in the process, taking advantage of mainly experiences of another companies, in a way to minimize the mistakes and to guarantee the success of the subcontracting project.

1.2. The decision on subcontracting of IT Development Systems (DS)

The decision on subcontracting or not subcontracting DS is today a crucial subject faced by companies’ leaders. The difficulty resides on the fact that the distinction between IT and each Company own business is becoming more and more difficult to be made and also DS is becoming one of the most important differential items in a competitive market. The subcontracting in DS has been growing each year, it is an irreversible process, although it requests a series of cares. The popularization of success experiences and of great international contracts, as the one of Eastman Kodak and the one of General Dynamics, certainly come contributing to endorse the generalized trend of subcontracting in DS.

STUTZ (1999) quotes that a pressure of the market exists in the sense of inducing for the subcontracting in IT, because the adoption of new technologies (for example: ebusiness, ecommerce, internet, intranet, EDI, etc) has been the exit for the leverage of the companies and they get like this to assist to the market demands and to obtain competitive advantages. According to CAVALCANTI (1999) the subcontracting tends to proliferate because on a side there are technicians avid for knowledge and a technology blunting through fast and efficient solutions, and on the other side managers anxious for solutions to problems that swallow financial. It is visible the growth of subcontractors in IT, with the appearance of new companies specialized in specific segments of market, in the amplification of those that render more generic services and in the improvement of the quality of the rendered services. Be also stood out the refinement of negotiation processes and contract confection, what comes guaranteeing the necessary legal support and establishing the rules clearly among the involved parts.

STUTZ (1999) still gets the attention that “the subcontracting process has matured and is een by the administrators of the companies as a strategic alternative (managerial tool) that should be taken in consideration in the analysis of the generation of results that lead to the business objectives, and not only a form of reducing costs, that could even never happen in fact...”

There is not a unique rule neither standard procedures on subcontracting in IT - Development Systems. Specific studies should be carried out in a case by case methodology since DS is not a commodity product or service, that can standardized. MICHAEL. (1998) affirms that “nowadays, the tendency is for a selective or strategic subcontracting and for the search of
alternative roads.” He still affirms that subcontracting of a Company's essential systems can be dangerous, mainly if they are efficient—in that case, it would be better to cope with the costs and to maintain the internal operations. He also suggests that the technology commercial value should be appraised in comparison with the operational acting of the associated service to verify if subcontracting is worth or not. The author proposes that subcontracting is a solution in cases where the operational performance is weak; for those activities with high performance, he proposes a better evaluation of the market in a benchmarking process.

FEENY and WILLCOKS (1998) stand out three challenges in the exploration of the IT - Technology of the Information that any organization has to face along time:

- To assist to the need of a strategic alignment between the company and the technology;
- To obtain the supply of the services of Information - Systems with low cost and high quality;
- To project the architecture of IT, choosing the technical platform more adapted to set up IT services.”

A research accomplished among 61 organizations of Great-Britain and of United States identified nine essential competences that help the companies when they face the three challenges:

**Leadership** paper usually exercised by the computer science directors or directors of technology of the information, that have as great challenge to integrate the initiatives in the areas of IT with the business main objectives and the managerial processes and to administer the interdependences among the several areas of the companies; Reasoning based on the managerial systems, that is about the capacity to project the managerial processes that the technology will support.

**Creation of relationships**, aimed at facilitating the dialogue between technicians and users, seeking a climate of mutual trust, good communication and identity of purposes;

**Planning of the architecture of systems**, that would leave for the Companies the decisions on investments in computer infrastructure. For a lot of organizations this function would fit external vendors.

To put the technology to work, competence of obtaining technological progress quickly not importing the means. In practice it would requires the existence of at least an internal technician to solve problems quickly, without the need of hiring third parties. Centralized purchases mean to maintain on the administration of the company the process and strategy of purchases that come to assist to its needs.

**Facilitation of contracts** to guarantee the success of the IT contracts. In practice, it consists of maintaining a facilitative manager between the vendors and the users of the services. Accompaniment of contracts, to protect the company against eventual circumstances. It means to make the vendors responsible for the technical attendance to the contracts and for the development of standard patterns for services.

Development of vendors understands the capacity that the organization has to explore and to develop its suppliers to go beyond the strict requirements of a formal contract. The importance of a sustainable partnership relation moves away the need of constant changes and therefore increases in its current costs.

Actually the modern literature calls attention for certain factors (entitled as essential competencies) that are strategic and decisive for the success in subcontracting by itself. And also depending on the situation of each organization before those competences, it is possible to define with more property what should be in charge of the organization personnel and what should be left for subcontracting.

1.3. **The risks of the subcontracting in DS**
MICHAEL (1998) proposes to the managers to ask the following question before deciding for the subcontracting: “Why not to look for resources inside of the own company?” And he alerts for the 11 risks of subcontracting:

Vulnerable management: The cause of the bad quality or of high costs can be a problem of bad management or of inadequacies of scale economy. The alternatives would be the rationalization, sharing of computer science resources with partners, the recruiting of a better computer manager or the improving the internal team before subcontracting.

Inexperienced employees: This fact is opposed to the appealing argument in favor of the subcontracting. I says that IF companies use to have more specialized personnel. This is not always true! What has been happening frequently is the transfer of employees from the contracting to the subcontracting company. So many times, they transfer the weakest or less specialized personnel. Other firms steal from the contracting company a leading technician to be the project manager. The way to reduce the risks is to foresee well in the contracts a polities to address the training of human resources.

Managerial uncertainty: Some of the reasons for the subcontracting are the reduction of costs, the transformation of fixed costs in variables, the need to concentrate in the core business. However the uncertainty of the future business can harm the company if the abiding contracts are not flexible and if the company releases its intelligence in that process.

Technological lag: This risk also exists with the subcontracting, because the subcontractors cannot be modernized and in some cases they can already be lagging behind in the beginning of the activities. It is common for companies to have as expectations the reduction of costs of the learning and of technological innovations. As safeguards the companies should demand those conditions in the contracts or to negotiate them in the contractual revisions. In case of failure in contracts, the only way out is the substitution of third partners, what is always traumatic for both partners and harmful for the company goals.

Endemic uncertainty: The uncertainty is always present in the operations and in the development of the IT. The users don't know well or they don't know how to express its needs, the new technologies always present risks, the needs are changeable and the implementation is full of surprises. The management of Systems Project, that has rigid budgetary controls and temporal deadline, can result in products that do not use all its potential or with specific conflicts for the users. The exit is to avoid rigid contracts, foreseeing revision mechanisms or periodic flexibilization, although they are redundant in more expensive contracts.

Hidden costs: Companies tend to underestimate or even not to account for given implementation costs such as Professionals' changes, movements and even the own project management uncertainties.

Lack of organizational experience: Unlikely, the new information technologies will arrive to the companies through the third partners. Experience and knowledge is required for the contractors to search improvement in the market. The solution comes from a partnership, but it requires a previous knowledge from the contractors.

Loss of innovative capacity: The fact of the companies transferring for third parties the responsibility for IT has taken many companies to a loss in its capacity for innovation, because the third partners can not supply their needs in terms of experimental and managerial competence, in order to propose revisions and modernization in the processes.

Vicious circle: With the subcontracting the computer science professionals who were in the company to exercise a mediator paper between its manager and the third partners, complain for not having time to discuss important issues with the third partners; these ones, for their turn, allege not to have access to the executives. On one side, the professionals of the
contractors try to specialize in project management and the third partners in the knowledge of the organization. The solution is in removing the middlemen of this process.

Technological Unit: Great part of an IT/DS processes cannot be divided into different parts to be made by more than one partner. The unity cannot be broken. A series of problems can happen in the interface among different subcontractors or in that between the domain of the third partners and the one of the user. This degree of interdependence has been bringing serious complications. It is advisable to think twice before subcontracting the indivisible areas of IT.

Confused focus: The subcontracting only guarantees the supply of IT, in operation terms, development, services and computer science training, but they don't guarantee innovative applications nor compromise with indispensable challenges to the implementation of new systems. The subcontracting allows that the company concentrates on how to use the technology of information and not on how to do it.

MICHAEL (1998) also says that “the fact is there are limits for the returns that can come from investments in subcontracting of services. The great benefits tend to appear exactly from the transformation of the business, something that can be made possible by the computer science.”

1.4. Decisive factors for the success of the subcontracting in DS

There are several factors that condition the success of the subcontracting, standing out the definition of the subcontracting levels, the internal personnel's preparation, the partner's choice and the clauses of service contract, according to LEITE (1994). One cannot also forget about the importance of the administration of the subcontracting process as a fifth factor to be added. Below, there are some thoughts about these factors relating to development of systems:

Subcontracting levels: The manager of projects of STEFANINI Consultoria, Sérgio Noronha, affirms that “the great processes of subcontracting of IT should follow a strategic plan for its successful implementation, based on the definition of each stage of the migration process.” Marine Claúdio, Operational Director of TIE LINE alerts for the fact that “... the subcontracting process should be driven by the high management of the company. Such measure seeks the constant adherence of the process to the schedules objectives, eliminating any possibility that individual interests determine the decision-making process and the implementation of the subcontracting. The first thing that the company needs to define is where to arrive with the subcontracting and what level of subcontracting for not losing the objectivity and coherence in the recruiting of the services (LEITE 1994).

The Subject of the contracts: GONÇALVES answering to the question: “Subcontracting is worthwhile?” says that “It will depend on the correct definition of objectives to be reached, on the establishment of the services requirements and control instruments and, as it could not be different, on the correct choice for the third partners”. He recommends although “Contracting and contracted should define with clarity which the level of hired service ” alleging that reactions contrary to the subcontracting movement can happen on the part of the users if they not to know what was really hired.

STUTZ (1999) gets attention for the care with the subcontracting contracts. “Contracts of subcontracting of long period tend to larger risks due to several factors, such as: changes in the strategies of the business, change in the technological needs, brake of some clauses of the signed contract, need to cancel the contract and to reacquire the control again.” It still recommends “the flexibilization in the contracts is absolutely necessary...” and he alerts for the companies to evaluate “the difficulty that the administrators will have in managing all the subcontracting processes...”
He also suggests that the contracts should be very detailed and elaborated, with very defined, appropriate objectives, definition of responsibilities, safeguards for information safety, flexibility and should possess quantitative measures that allow the accompaniment of their execution and of the quality of the rendered services. They should take into account the fast rhythm of the constant technological and managerial changes, through which the companies are going. Besides the contracts should be selective, that is to say, to possess own approaches, dividing the services in parts, in way to distribute them to different companies...

Internal personnel's preparation / Communication: It is necessary to define learning policies and knowledge transfer between contracting and contracted parties, since a company, when subcontracting services, should not become hostage of the other, what is feared by many business leaders. To mix the internal personnel with partners' team is highly recommended, because the business rules are usually domain of the internal team, whereas the technological innovations are in the hands of the specialized partner. It is also recommended that “all the segments of the company directly affected with the subcontracting has to be informed of the project as a whole so that they don't feel betrayed by the company, because that could generate an insecurity climate and dissatisfaction and to cause a great damage to whole the project.” CAVALCANTE (1999), for instance, proposes that the contracting party should evaluate the curricula of the technical team of the third partner, in order to guarantee solutions that fill up the contracting company expectations.

Choice of the partner: It is a fundamental requirement for a good result in the subcontracting process the existence of the partnership. It is advisable that the contracting partner measures the potential of the contracted partner and its experience, performance, and the cases of success and failure. Both partners should discover together the roads and solutions of IT to guarantee the evolution of the company in the future (CAVALCANTI 99). All partners should be alert for the fact that “the solidity and capacity of the company to be hired should be evaluated” and that the companies, besides aiming at a better relation cost/benefit, should give preference to more solid companies that are in the market and that have already developed some service with similar characteristics” (STUTZ 99).

Administration of the subcontracting: The manager of projects of STEFANINI Consultoria, Sérgio Noronha also emphasizes that “Other indispensable inquiry is the use of administration tools for area of IT, tends as objective the accompaniment of the projects in development, maintenance of the subcontracted systems, future projects, measure of the index of the internal customer's satisfaction, the users' qualification, among other.” It is important for the development activities and maintenance of systems the use of method to allow the quantification of the accomplished work and it proposes the technique of FPA–Function Point Analysis). Such a technique allows the settlement of rules or points to set a system or function based on the specification and complexity degree of the task to be implemented. The companies contracted for more specialized services in IT are adopting this practice, being therefore a market trend and a requirement for future contracting parties.

2 RESEARCH METHODOLOGY

The field research was accomplished in 28 institutions, including those that contract DS services and the ones that render such services. Some of these institutions, regardless of being contractors or third partners are also working in other Brazilian states, especially in the Northeast. The research tried to investigate the subcontracting process in the development of systems, with respect to the leaders' vision, objectives, future vision, benefits, risks and experiences. Fifteen contracting companies and 13 third partners were consulted. The interviewees were the representatives of the high direction of the institutions or class entities, being almost always the responsible persons for the areas of technology of information, commercial or marketing.
The objective was to contrast the visions and experiences of contracting parties with those of the third partners, to identify common points and divergences, to understand better as this process is being carried out and to contribute for a better performance with sounding recommendations.

To have a very representative sample of the institutions, the research made the selection taking as base a broad approach classifying companies according to the type of economic activity and juridical nature. For the qualitative nature of the study, a wider sample would be inadvisable, because it could make unfeasible the long and in-depth interviews. The investigation was accomplished through interviews supported by structured questionnaires. The inferences and conclusions were not made merely on statistical grounds.

2.1. Researched institutions and profiles:

Of the 15 researched institutions, nine were of the private section, representing 60% while 40% were of the public section. Of the 15 researched institutions, nine were of the private section, representing 60% while 40% were of the public section. Of the 15 researched institutions, nine were of the private section, representing 60% while 40% were of the public section. With relationship to the subject about experiences in subcontracting in the DS, 93.33% of the sample had already concrete experiences and only one is in phase of initiation of the process (6.67%), characterizing therefore, to be indeed a practice in use in the market from Ceara. With relationship to the participation of the third partner in the budget - 33.33% of the interviewees already have all its services of DS sub-contracted, that 60% spend from 60% to 100% of the budgetary resources with subcontracting and that has been happening a growing movement to increment subcontracting in the last three years. With relationship to the third partners and the largest Customer's percentile participation in the general revenue. 23.08% of the companies have a customer that represents more than 50% of its revenue, 38.46% with a customer that means of 25 to 50% of the revenue, what demonstrates that most of the vendors depends on a great customer, fact that leaves them more vulnerable for that customer's eventual loss.

3. ANALYSIS OF THE RESULTS

While the third partners unanimously declared themselves in favor of subcontracting, the contractors were divided. The depositions against subcontracting presented previously, left the contracting institutions of the public sector, that expressed its dissatisfactions and the manifestation that they only make it for absolute lack of personal. They complained about the risk, the dependence and the non compromise of the third partners. The arguments in favor consider subcontracting a viable, strategic process, that reduces costs in the medium and long run, that liberates the institutions to focus on the core business, giving the development of systems for third parties that know better the technology.

It is worthwhile to mention the restrictions the contracting parties have laid for an effective subcontracting system: the cost feasibility, the care with the administration, the need of a careful preparation for an effective partnership. They have also placed restrictions with relationship to the dependence of the third partners and the fears in subcontracting critical systems related to the main objectives of the institutions. On the side of the third partners, they emphasized possible problems with the non partnership, with the non transfer of technology and with the bad defined contracts.

The contracting parties chose the strategic advantages and personnel management as the most important advantages while the third partners chose only the strategic advantages (32.69%). While the management costs and accompaniment of the technology were close to be chosen as second and third places for the third partners (with 21.15% and 17.31%), such advantages were also important in the vision of the contracting parties (21.74% and 13.04%). In certain way there was a convergence of visions between both groups with small percentile variations. In the group of strategic advantages they were outstanding the subject of the quality, of the freedom to focus on the core business, of the “cost reduction” of the
organizational structure and of the agility in the solutions. It was also mentioned, and it deserves prominence for the importance given by the interviewee, the advantage of the knowledge of the business and technology by the third partners who could activate solutions allowing to short gaps in the learning process. In people's management, the emphasis was on small investments for training, on the flexibility for hiring professionals. Related to costs, there was an unanimous opinion that subcontracting reduces costs, specially on the long term and also that it promotes a transfer of fixed to variable costs and that it facilitates a larger control of the costs. The contracting parties related a lack of a technological accompaniment for the contracting parties, but also the readiness of the technology in the market and the fast aggregation of new market technologies for the company. With relationship to the administration of the service contracts, both parties mentioned the easiness of the general administration through contracts, when well elaborated, with the object and levels of established services well specified. With relationship to the group of technological solutions, they mentioned the advantages in the speed of solutions, the largest possibility of choices and the technology transfer.

Both groups said that the largest disadvantage for the contracting parties is the vulnerability, the outstanding risks for the transfer of the knowledge of the business, no guarantee of continuity, the risks for the dependence, the subject of the secret of the information, the loss of the control for the contracting party and the lack of the partner's reliability. The administration of the subcontracting process and the quality of the products/services were chosen as second and third places by vendors.

According to the contracting institutions the three larger motivations for subcontracting are the agility in implementing solutions, access to new resources and technology and better quality in the services; in a second place, comes the focus on core activities, cost reductions and the labor shortage. In the vision of the third partners, the largest motivational factor for the institutions is cost reduction, followed by the speed in the implementation of solutions and focus on end-activities. In second plan, they locate the best quality in the services, the previsibility of the expenses, the access to new resources and technology and finally the complexity of the DS activities. Clearly, the visions differ in relationship to the importance of motivations. There was only one agreement in the group for the three larger motivations for subcontracting: agility in implementing of solutions. The third partners, however, see the reduction of costs as the great motivation factor, diverging from contracting parties that put this on a secondary plan. The labor shortage has been one of the great motivations for subcontracting in the public section. Quality and access to new resources and technology are seen as important and motivational factors for the contracting parties, differently from the third partners opinion. These are important results that can guide the third partners in the moment of deciding for specific commercial strategies. The problem of non-compliance to deadline in DS was for several times mentioned in the interviews as a crucial factor, that persists regardless of the services being subcontracted or not. The great majority of those researched understands that there should not be restriction to the system type to be subcontracted, therefore, being able to be an end activity, an auxiliary one of even a critical or sensitive systems. These results suggest that the idea that end activities or strategic systems should never be subcontracted is been demystified. Some interviewees alerted for the importance of the transfer of the technology for the third partners and of an effective participation by the people's of the institution in the specification of the system to preserve its control and intelligence.

Instigated to talk about the criteria they used to hire third partners, the contracting parties highlighted the technical training as differential factor with 80% of indications. Soon after there are prices, quality of the services and the partner's reliability and of successful experiences. The binomial technical training and prices prevail in the suppliers' decisions. Price, however, is not a decisive factor for other subcontracting, such as commodities. The demand of a recognized technical capacity of partners demonstrates that in IT the "technical best" still makes difference. It is also noticed a concern related to partners' experience and reliability in the selection process. Publix Inariririona complained of the rigidity of the legislation, with a difficult and slow purchasing process. They alleged that to guarantee the qualified, competent and suitable partners' selection is not always possible, requesting thus special cares in the elaboration of the specifications and in the proclamations in general.
A percentage of 53.33% of the contracting institutions maintained their technical personnel what suggests that subcontracting has been adopted to assist specific demands of IT and/or to decrease the backlog of development. The absorption for the third partners and incentive for voluntarily redundancies happened in 13.33% of the institutions. One of the interviewees stimulated the creation of individual companies and personal computer-companies for its former-employees and it hired them to render services.

In spite of the interviews where quality is always pointed out as a motivational factor, partners are not using quality models in practice. On the side of the contracting parties, there is not a systematic scheme to accompany quality; under the third partners, however, there is strong suggestion for the creation of central of attendance to users and the accomplishment of periodic meetings for evaluation of the quality. It deserves prominence the initiative of a third partner creating the illustration of OMBUSMAN, that accomplishes visits to the customers with the intention of evaluating the services and satisfaction levels. This point will also be a competitive differential of market for those third partners which offer relative advantages in quality product or services. The adoption of programs or quality models in software development tends to differentiate the third partners, although very little action has been observed in this matter.

On the benefits from subcontracting, the contractors highlighted the best quality in the services, agility in the implementation of solutions and the access to new resources and technology as the three more important advantages. In a second plan, they mentioned the focus on end-activities and the reduction of costs. Confronting with the answers given about the motivations that lead the organizations to decide in favor of subcontracting, there is a coincidence on the three main factors. With relationship to focus on end-activities and reduction of costs, there was also an identity of the motivations with the benefits. So, under the point of view of the contracting parties starting from its effective experiences, the reached results are convergent with the objectives waited from subcontracting. It has to be pointed out that, as analyzed in the topical motivations for subcontracting, the third partners diverge from this view when they affirm the three more important motivational factors are: reduction of costs, focus on end-activities and agility in the implementation of solutions.

Imprecision in the specifications were considered as the main problems faced by both partners in subcontracting. This problem becomes even worse because it causes additional wastes and losses due to reprogramming, rework, re-schedule, raising costs, besides a general dissatisfaction for both partners and the users' of the system. The solution goes by the formalization of the specifications, backed preferably by contract and for the users' active participation in the knowledge of the process to be hired. While third partners chose the excess of expectations of the contracting party as the second main problem, the contracting parties considered their counter-parts unprepared for subcontracting obligations and also their ignorance of the business as serious problems. Also, the contracting parties recognize as a problem of themselves their lack of preparation for the subcontracting The excess of expectations is justified mainly for the non-clarity of the specifications of the negotiated services, even the written agreements do not contemplates the exact quality of the final product. This business ignorance probably makes the dialogue difficult, delays the process and leaves them more vulnerable to the mistakes of definitions. As a very important problem, the third partners point out the contractors' technician's internal resistance for subcontracting. Such resistance can be consequence of the internal personnel's non preparation, of insecurity for the fear of dismissals or even for difference of salaries.

Investigated about the main concerns in the process of subcontracting in DS, the third partners indicated, in this order, the control of the quality and levels of services, the control of the periods and the control of the costs. On the other hand the group of contracting parties, aimed the control of the periods for quality control and the secret / confidentiality of the information together with alternative procedures in case relationship problems come to happen. There is an identity of opinions with relationship to the two main items, although the concerns were more representative for the third partners. Deadline, as mentioned previously, is a crucial point in DS and brings reflexes in quality, because smaller periods usually reduce quality levels. Important to realize that the three main concerns mentioned by the contracting parties: alternative
procedures, care to avoid dependence entail and to avoid legal labor cases, are not part of the list of the main concerns of the third partners.

As main strategies to minimize the faced problems and concerns, the contractors affirmed to have adopted or intended to adopt transparency in the relationship, in this priority order, to invest in the partnership and compromise, to create an administration process with managers in both parts and to stimulate the qualification of the third partners. Meanwhile the third partners have opted for the following strategies: transparency in the relationship, to adopt quality programs, to invest in the partnership and compromise and to create an administration process with managers in both parts. Two of the main common strategies show the tendency of the parts in the search of an effective partnership, where the mutual trust does exist, a cooperation climate and a posture of negotiation of the type “win-win.” Two divergences of opinions with relation to the main strategies are here stated: the first is related to the adoption of quality programs that is mentioned by 61.54% of the third partners and for just 13.33% of the contracting parties, meaning that there is an ignorance of the contracting parties on the subject, although they have previously demanded quality. The second deals with stimulating the personal qualification that is more strongly present in the vision of the contracting parties, which suggests an expectation for larger competence and a relationship of more durable partnership. The third partners in the proportion of 30.77% think of adopting or have adopted the FPA in the contracts as business strategy. No doubt, as it has been stated before, those that adopt this strategy will tend to have larger receptivity and market preference, because it turns commercial relationships more transparent. Analyzing the main strategies with the faced problems and concerns, one may conclude that with these two main strategies, the institutions are looking for more reliable and effective partnership, and that these strategies are fundamental conditions for the success of a subcontracting project leading probably to minimize the partners’ concerns and diminish the present difficulties. The creation of a management team with managers from both parts will contribute also to solve concerns relative to the planning and accompaniment of the project, control of periods, quality and service levels, people’s administration. However some of the main problems mentioned won’t necessarily be resolved with those strategies, such as the imprecision of the specifications, the non-preparation for the subcontracting, the ignorance of the business and the excess of expectations, among others. To solve them, the implementing of quality programs in software and of DS methodologies, the adoption of FPA or similar techniques of analysis are a required step. Strategies with relationship to the people’s administration were raised and they should be defined, mainly for the third partners, going through a program of personnel, contemplating the reception, definition of profiles, training plans, remuneration system and promotions for merit. The adoption of personnel policies is fundamental, so problems such as the lack of compromise and of motivation, high turnover and technical expertise could be solved.

The key factor of success most mentioned by the third partners as responsible for its managerial performance was quality; in second place, the technical training, the capacity to offer fast and personalized solutions and technological modernization. When comparing these results with the approaches used by the contractors for selection of their suppliers the divergences of opinions suddenly appear. In the vision of the contractors the most important approach is technical training; in second place, prices, followed by services quality and reliability. Such results suggest that the third partners should work these factors adjusting them to the market demands, investing therefore not only in the training, and quality, but in price policies and company image.

As plans for the future, 60% of the contracting institutions intend to maintain the current subcontracting level, 20% plan to intensify fully to a 100% level, and 6.67% just to intensify a little more and the remaining ones 13.33% don’t have a position on the subject. In addition to the answers some contracting parties affirmed they are evaluating the real subcontracting needs, the possibility of PDV–Program of Voluntary Dismissals, the viability of public competitions and revision of processes, profiles and a general appraisal of the personnel structure. Under the point of view of the third partners, there is a diversity of plans and projects with the more diversified objectives, such as to increase the development of “packages”, to enlarge market diversifying the customers, to expand business with the public section, to diversify into other computer science
services, to enlarge partnerships with suppliers and to establish alliances with firms seeking to integrate solutions, to develop integrative solutions integrated, type ERP and not to develop single products (only if the load of the project justifies / unless the specification is complete and clear).

5. CONCLUSIONS

Subcontracting in DS is consolidating in the market and tends to grow quickly. The plans for the great majority of the researched institutions are of maintaining and or intensifying this process. The arguments in favor of subcontracting sees it as a viable, strategic process, that reduces costs in the medium and long run, liberates the institutions for focus on their core business, relying DS projects for third parties, who have the technology and know-how to perform them with better quality. The restrictions are relative to cost feasibility, care with the administration, the need of a preparation and of an effective partnership, the risks of the dependence and of the non compromise of the third partners. Public sector contracting institutions have opinions different from the private sector and expressed their dissatisfaction with subcontracting. They have followed the market only for the absolute lack of trained personnel, suggesting a defensive movement against subcontracting. The research has also shown that the idea whereby end-activity systems should not be subcontracted due to its strategic base has been rejected by the market. This has been demystified by the great majority of organizations.

Related to the motivations for subcontracting, the visions of contractors and third partners differ substantially regarding the importance of many variables. Great agility in implementing solutions was the only agreement in the group of the three larger motivations for the subcontracting. The third partners already see the reduction of costs as the great motivation factor diverging from the opinion of the contracting parties which put this to a second plan. The labor shortage has been one of the great motivations for subcontracting in the institutions of the Public sector. Services and or product quality and access to new resources and technology are seen as important motivational factors for the contractors, differently from the opinion of the third parties.

For the contractors the great advantages of subcontracting are: better quality, liberation to focus on core business, reduction of the organization structure, agility in the solutions and of the Personnel Administration. Both groups said that the largest disadvantage for the contractors is the vulnerability, standing out the risks for the transfer of the knowledge of the business, the risks of no guarantee of continuity, the risks for dependence, the secret of the information, the loss of the control for the contracting party and the lack of the partner's reliability.

The binomial technical training and prices prevail in the decisions of selection of the suppliers, not being price a decisive factor. The demand for a recognized technical capacity of partners demonstrates that in the area of IT the “technical best” still makes a difference. The key factor of success the third parties single out as the most important was service/product quality, followed by technical training, capacity to offer fast and personalized solutions and technological modernization. Confronting these results with the approaches used by the contractors for selection of their vendors, divergences of opinions appear sharply. In the vision of the contracting parties the most important approach is the technical training, followed by price and tied in third place the quality of the services and reliability. Such results suggest that the third partners should work these factors adjusting them to the market demands, investing therefore not only in training, in quality, but in their price policies and company image.

Regarding quality, in spite of being appointed as a motivational factor for subcontracting and one of its important advantage, in practice they are not using quality programs or quality models in software. On the benefits of subcontracting, the contractors highlighted the best quality in the services, agility in implementing of solutions and the access to new resources
and technology as the three most important results. Comparing with the motivations that lead the organizations to decide in favor of subcontracting in DS, a coincidence of the three main factors was observed, but with different proportions.

On the main problems, the imprecision in the specifications was a convergence point between contractors and third partners. This problem becomes worse in the subcontracting, because it provokes wastes in the partnership by re-working, re-programming, and raising costs, besides the dissatisfaction of both partners. In second place, the third partners criticized the excess of expectations of the contractors, whereas this group considered the third partners unprepared and ignorant of the requirements of the business.

Two of the main common strategies show a common trend for a better relationship among the partners, with a mutual trust, a cooperation climate and a negotiation posture of the type “twin-win.” Divergences of opinions appear with relation to the adoption of quality programs that is mentioned as important only by the third partners, inferring that there is an ignorance of the contractors on the subject, although they demand high quality for the services.

Analyzing the main strategies with the faced problems and concerns, the research concludes that with these two main strategies the institutions are looking for an effective partnership, fundamental conditions for the success of a subcontracting project that could minimize the present difficulties and concerns. However, some of the main problems mentioned won’t necessarily be resolved or livened up with those strategies, such as imprecision of the specifications, the non-preparation for the subcontracting, the ignorance of the business and the excess of expectations. To solve them, it is necessary the implementation of quality programs in software and of DS methodologies type FPA. Strategies with relationship to the people's administration are being raised and they should be defined, especially for the third partners for their lack of human resources. It is fundamental the adoption of Personnel Policies so that problems such as the lack of compromise or motivation, high turn-over, and lack of expertise could be resolved.

BIBLIOGRAPHICAL REFERENCES


