Analysis of IT Strategic Alignment: a Case Study in a Educational Organization

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Summary
In order to evaluate the impacts of Information Technology (IT) in organizations strategies and operations, it is necessary to consider both efficiency and effectiveness, analyzing if the results are aligned with organizations objectives and goals. IT strategic alignment is fundamental to sustain organizational effectiveness. This alignment has been emphasized in companies of the private sector, but the public sector has been less studied. The objective of this paper is the analysis of how the strategic alignment of IT occurs in public institutions. The methodology used is case study which was carried out in a Brazilian Public Institution of Undergraduate Education.
Key-words: Strategic alignment, Information technology, Public sector.

1. Introduction and Objectives
Since the end of the decade of 1970 and during de decade of 1980, it was discussed forms of better using the Information Technology (IT), with the objective of turning the organization more competitive. A lot of theories, models and techniques were developed and studied so that IT could be used aligned with organizations strategies and operations. To evaluate the impacts of IT in organizations operations and strategies, not only efficiency should be focalized, but mainly effectiveness, that is, the results of these applications should be evaluated in respect of objectives, goals and requirements of organizations (CARVALHO e LAURINDO, 2003). Effectiveness should be maintained along time, being fundamental the concept of strategic alignment of IT with business.

According to Henderson & Venkatraman (1993), the lack of organizational ability in obtaining considerable return over IT investments is partially due to the lack of coordination and alignment between business and IT strategies This adjustment, that includes business strategy, IT strategy and the organization internal structure, is not an isolated event, but a dynamic and continuous process. Even a sophisticated IT application, if considered in an isolated way, can not sustain competitive advantage (LAURINDO, 2002). However, there are many questions about the real gains obtained from IT investments. In this scenario, many models were proposed for IT analysis and evaluation of its influence in organization activities, management, structure and strategy. Laurindo (2002) presents a view of different forms of IT analysis and evaluation in organizations, and proposes a comprehensive model (MAN/TI). Although there are many studies about IT strategic impacts in organizations, studies about information systems and competitive aspects in the public sector are less common. Salmela & Turunen (2003) emphasize the relevance of IT in the public sector and point out the need of more studies in the area. Public administration must show efficiency in its operations, as well as effectiveness in obtaining results in its specific activities (FUGINI, MAGGIOLINI, PAGAMICI, 2005). The objective of this paper consists in analyzing how the
alignment of organizational strategy and IT strategy occurs, focusing on a service organization from public sector. The adopted methodology was case study, which was carried out in a Brazilian Public Institution of Undergraduate Education.

2. Model for Organization Analysis and IT Structure - MAN/TI

The proposed model was based on case studies of preceding researches (Laurindo, 2002, 2000 & 1995) and covers many tools and methods for IT analysis. The different tools’ contributions are complementary, since they represent different perspectives and provide a complete view of IT analysis and planning in organizations. This model, named MAN/TI, is based on two groups of factors: structural factors (operation type and industry characteristics, geographic dispersion or concentration, process and/or products homogeneity, marketing strategy, IT function in organizations strategy, critical success factors, culture) and factors relative to IT organization (structure of IT department, information systems stage, reasons to decentralization, users participation level, social-technical aspects). From the analysis of these factors, is possible to take two conclusions: which is the IT infra-structure organization more proper to company structure and the degree of adequacy of the present IT organization. The methodologies and tools on which the model MAN/TI is based are shortly presented in the following section.

2.1. Models for IT Role Analysis in Organizations

2.1.1. Critical Success Factors (CSF)

It is common to managers having difficulty in obtaining useful information from information systems in order to make correct decisions. One proposal that showed to be effective too cope with this difficulty was the Critical Success Factors approach (ROCKART, 1979). Critical Success Factors can be defined as a limited number of variables in which an organization must present good performance in order to sustain its competitive strategy. These variables must receive constant attention, being measured and, if possible, improved, on order to organizations objectives can be achieved. Although the original conception of the CSF method was addressed to the main organization executive, it is useful to diverse management levels in different organization areas, and it can be successfully used to select and prioritize new IT application proposals.

2.1.2. Strategic Grid

The strategic grid model, proposed by McFarlan (1984), allows to analyze the impact of IT applications on organization business, both in the present (existing applications) and in the future (planned applications) (Figure 1).
The strategic grid allows analyzing the positioning of IT area in the organization structure and the way that IT is managed. If the organization is situated in the quadrant “Support”, it is not necessary to the IT area to have a detached position in the organization hierarchy. If the organization is situated in the quadrants “Strategic” or “Factory”, it is very important to IT to be in a higher level in the hierarchy.

### 2.1.3. Information Intensity Matrix

The information intensity matrix is based on the value chain concept and allows analyzing the intensity of information on product and on process (Figure 2). In organizations where processes and products contain much information, information systems have great importance.

### 2.1.4. The Strategic Alignment Model

The more strategic is IT use in the organization, the greater the need of alignment between IT and business strategies. Henderson & Venkatraman (1993) proposed the Strategic Alignments Model to analyze how the alignment of IT strategy occurs in the organization, based not only on organization internal factors, but also on external factors (Figure 3).
The model considers four factors (or domains) that take part of the strategic alignment process: business strategy, IT strategy, organizational infra-structure and processes and IT infra-structure and processes. The model emphasizes the importance of the concept of “strategic adjustment” (relationship between strategy and infra-structure) and of “functional integration” (relationship between IT and business function), both on the strategic and on the infra-structure level. Henderson & Venkatraman (1993) and Luftman, Lewiss & Oldach (1993) presented four main perspectives of strategic alignment, two of them driven by business strategy – Strategy Execution and Technological Transformation – and the other two driven by IT strategy – Competitive Potential and Service Level.

2.2. Models of IT Management and Organization Analysis

Nolan (1979) proposed a six stage classification of IT evolution in an organization: Initiation, Contagion, Control, Integration, Data administration and Maturity. Donovan (1988) proposed a model to analyze IT decentralization in organizations, presenting four extreme cases, according to Figure 4: Watching Dog, Network, Big Brother, Helping Hand.

According to Buchanan & Linowes (1980), there are reasons that can lead to IT decentralization: differentiation pressure, direct control desire and linking of information
support to power. The same authors proposed tools to analyze the adequate degree of IT decentralization in an organization. Grajew & Oliveira (1987) presented the distinction between IT function (general IT aspect in organization) and IT operation (implementation and use of specific applications for the diverse users) and a classification of IT decentralization stages in an organization based on these two concepts. According to these authors, the phases of the information process in organizations through the years are:

- **Phase I** (60’s) – Centralized function with centralized operation – Original Batch;
- **Phase II** (70’s) – Decentralized function with centralized operation – Users Anarchy;
- **Phase III** (80’s) – Decentralized function with decentralized operation – Technological Fantasy;
- **Phase IV** (90’s and on) – Centralized function with decentralized operation - Coordination.

4. Methodology

As mentioned, the objective of this paper is analyzing how IT strategic alignment occurs in public institutions. The methodological approach was qualitative research, using the study case method (YIN, 1991), that is proper to situations in which the objective is answer “how” and “why” questions and in situations in which a better comprehension is searched (CLAVER, GONZALEZ & LLOPIS, 2000). Data and information about the studied institution were obtained through semi-structured interviews with employees of IT area and user areas related to the organization activities. Complementary, documents and reports about organization strategy were consulted, besides organization strategic map, which was developed according to Kaplan & Norton model (2000). The interviews followed a questionnaire including the items of MAN/TI model, presented in the preceding item. The organization selected for the study is a Brazilian Public Institution of Undergraduate Education, which currently discusses its strategic objectives and administrative processes, and that considers IT use very important to a new and more effective process configuration.

4. Case Study

4.1. Organization Structure Factors

The studied organization is a Brazilian Public Institution of Undergraduate Education, with 15 departments related to the organization final activities, an administrative structure with 9 sectors and near 1000 employees, among academics and administrative staff. The studied institution is a unit from a major organization directly linked to state government, which imposes part of the information systems used. The organization does not have CSF formally established. A project of formulation and implementation of strategy is being developed, according to the Balanced Scorecard (BSC) method proposed by Kaplan & Norton (2000). Using the strategic map obtained in this project, the strategic objectives defined and through interviews with professionals from the IT area and from areas related to the institution final activities, there were identified the following CSF: quality in education and research, institution image and tradition. Among the current internal applications considered relevant to the organization and that contribute to the CSF, it can be mentioned: support system to teaching activities, intranet and electronic mail, undergraduate enrolling system, libraries support system, support system to scientific initiation scholarship and the organization site. The main systems from the central organs (related to the main organization) are: undergraduate enrolling system, graduate matriculation system, integrated system of libraries, support systems to financial and human resources areas and a system for localization of paper documents. The organization is planning to adopt applications in some administrative
processes, in order to increase efficiency and control, with tools such as workflow and systems for follow-up activities. Analyzing the positioning in the strategic grid, the studied institution can be situated in the “Factory” quadrant, since presently there is a collection of IT applications from which the organizations activities depend on. Not seldom, educational institutions could be classified in the “Support” quadrant, if we consider only applications such as text editors, electronic spread sheets or presentation software. However, if it was analyzed the importance of applications such as Internet, from which library services depend on to support research and teaching, IT the impact in the present is very high. Besides, in order to provide education of good professionals to the present market, students must have not only a good theoretical and conceptual base, but also knowledge of software and recent applications in each knowledge area. Thus, considering that education and research quality is one of the CSF of this institution, the use of IT applications is very relevant.

According to the information intensity matrix, the studied organization has high information intensity both in product and process. Although some authors do classify the educational sector in the quadrant “high information in product and low information in process” (WARD, 1988), it can not be considered that the process has low intensity of information, since it does not involve only the class moment, but also the whole planning process and the background of the academic as professor and researcher. The perspective of strategic alignment adopted by the studied organization is “Strategy Execution”, which corresponds to the classic model of hierarchical vision of strategic management. This perspective adopts business strategy as its driver. Based on the business strategy, organizational processes are established, which, by their turn, impact on IT infra-structure and processes. This perspective considers that systems must be developed with strong connection with business strategy, emphasizing the importance of organizational processes.

There are initiatives in some areas in order to develop internal systems and data bases. According to the IT area, the institution policy forbids such initiatives, as many times unnecessary systems and data bases are developed, generating disintegration and data duplicity. However, when other areas are interviewed, it is perceived that there is dissatisfaction about the systems developed by the IT area, which many times do not match exactly to users needs. Besides, there is frequent delays in attending these needs. The IT manager recognizes these delays, due to the small number of employees in IT area. Analyzing the reasons for this partial decentralization, it is noted that there is a desire of direct control by the organization areas, which want to develop appropriate systems. Besides, there is the fact that the employee who develops a system to his area acquires status and power.

4.2. Factors relative to IT organization

In order to analyze the degree of information decentralization in the studied institution, it were used the decentralization diagrams (Figure 5) suggested by Buchanan & Linowes (1980).
Evaluating the IT stage, the studied organization is situated between stage 4 (Integration) and 5 (Data administration). It is interesting to note that, according to the IT manager, some areas or processes are situated in precedent stages. Analyzing the stages of decentralized IT, it was observed that equipment is decentralized, but systems development and decision making are centralized, according to the policy adopted by direction and defended by IT area. According to this model, the studied institution is classified in the “Big Brother” stage. However, if it was considered the existence of sporadic initiatives of many areas (with characteristics of “mutinies”), the institution could be classified in the “Network” stage, with characteristics of Phase IV – Coordination. Considering the existence of individual initiatives, both function and operation would be decentralized, and in this case the institution would be in Phase III – Technological Fantasy.

According to IT area, user participation in systems development is only consultive. In the case of the systems developed by the central organs, sometimes the institution IT area is consulted, but the users do not participate. It is interesting to note that the IT area, one of the 9 administrative areas, has not been already formalized in the organization structure. This formalization depends on approval of the University central organs. The hierarchical position proposed is in a relative high level, just below direction (higher level). The IT area has existed in an informal way for near 13 years, working on systems development, implementation and maintenance. It has currently 13 internal employees and 7 trainees, and is composed by 3 sections – Technical section of support and production, Technical section of development and normalization and Technical section of data administration. Team work is organized adopting the approach of task enrichment, since there is emphasis in individual work (task division), but with comprehensive activities. Infra-structure is outsourced (networks, air conditioners, no-breaks), so as development of more complex systems and some kind of maintenance.

5. Analysis Interpretation

The classification of the institution in the “Factory” quadrant of the strategic grid justifies a higher position in the organization structure, since the operation of the institution depends on many ways of the existing IT applications. The current organization structure proposed, with the IT area directly to the director, in the same level of the other areas, is coherent with IT importance to the institution. In the same way, the organization positioning in the information intensity matrix (“high information in product and process”) justifies the relevance of IT to this institution.

The organization intends currently to adopt a process approach. The perspective of strategic
alignment adopted – Strategy Execution – emphasizes the organizational processes, being coherent with the yearned objectives. It has to be noted the current dissonance among the decentralization desire in systems development and decision making by the user areas, which is contrary to the policy recommended by direction and adopted by the IT area. Donovan (1988) argues that the migration from centralization to decentralization can bring advantages, such as costs reduction due to faster software development by smaller teams, increase in competitiveness and creativity. But it can bring disadvantages, such as the development of isolated (or even redundant) applications. The same author comments that to impose centralization, however, can stimulate “mutinies” from users that want to develop their own systems. In order to avoid these decentralized initiatives, perhaps it would be interesting to allow users real participation in systems development – in the institutions internal systems or in the central organs systems. Thus, it would be possible to align users’ real needs and requirements with organizational strategies. It must be noted that all interviewed users and also the IT team presented complaints relative to the systems imposed by the central organs. Maybe it would be necessary to evaluate the need to contract more employees to the IT team, to be possible to attend users more promptly.

Considering the evaluation of the range in the information decentralization degree relative to execution and relative to control, one more time is observed that there are areas with great centralization, while others exhibit decentralization, showing the existence of discrepancies among reality and directives. The IT stage – between Integration and Data Administration – is relatively evolved, in spite of the existence of areas in precedent stages. In organizations where IT has a role linked to organization business, stages more evolved are noted. One more time, however, the analysis shows discrepant results.

6. Conclusion

The studied institution shows coherent aspects with the organizational strategy, such as the proposal of valorization of IT area in its structure. It has to be evaluated which is the recommended policy relative to centralization or decentralization in systems development and decision making, so that the applications developed can be effective in obtaining adequate results to organizational strategy. It is fundamental to review the imposed systems, in order to verify if they are coherent not only with the strategies of the studied institution, but also with the central organizations strategies.

The analysis by the MAN/TI verified some characteristic elements of organizations in which IT plays a preeminent role, such as the positioning of the IT area close to high direction. The formal and many times bureaucratic procedures are inherent to institutions linked to the public sector, not only because of cultural issues, but also due to legal exigencies. These procedures bring difficulties not only to the final activities, but also to IT management, as in case of processes of service contracting, which can be quite slow. The educational activity has also its peculiarities, which are reflected in its administrative processes and consequently in its information systems. The studied organization undergoes a period of better definition of strategy, so as many enterprises do, without loosing its character of public institution. The process revision that is carried out will certainly strongly depend on of IT applications to be adequately implemented. This fact will straiten even more the relationship between IT management and institution direction. Besides, it would be interesting to compare this case with similar cases of strategic alignment in public sector institutions (as example, PEAK, GUYNES E KROON, 2005). These points must be deepened in future studies.

References


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