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Management of Information Technology Effectiveness In Brazilian Companies

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INTRODUCTION

Information Technology (IT) has an important role in the strategic function of the leading companies in the competitive markets. Particularly, *e-commerce* and e-*business* have been highlighted among IT applications (Porter, 2001; Evans and Wurster, 1999). The basic function for understanding IT is in acquiring a competitive advantage at the value chain (Porter & Millar, 1985.

Effectiveness, in the context of this paper, is the measurement of the capacity of the outputs of an Information System or of an IT application to fulfill the requirements of the company and to achieve its goals, making this company more competitive. In a few words, effectiveness can be understood as the ability of "do the right thing" (Laurindo, 2000; Walrad and Moss, 1993; Maggiolini, 1981).

Several problems have been discussed concerned with IT projects results in effectiveness of their management. In spite of different approaches about the "productivity paradox", there is a general consensus about the difficult of finding evidences of returns over the investments in IT (Willcocks and Lester, 1997; Brynjolfsson, 1993; Strassman, 1990). The evaluation of IT effectiveness allows the strategic alignment of objectives of implemented systems and their results with the company business vision (Laurindo, 2000; Laurindo and Shimizu, 2000; Hirscheim and Smithson, 1998).

The comparison and evaluation of business and IT strategies and between business and IT structures must be a continuous process, since the company situation is constantly changing to meet market realities and dynamics.

In order to understand how IT effectiveness can be managed, a comparative analysis about the role of IT in Brazilian companies is presented. The theoretical models used in effectiveness analysis were based on McFarlan Strategic Grid (1984) and Henderson & Venkatraman Strategic Alignment Model (1993) approaches. Three cases studies are performed in financial, telecommunications and building materials companies.

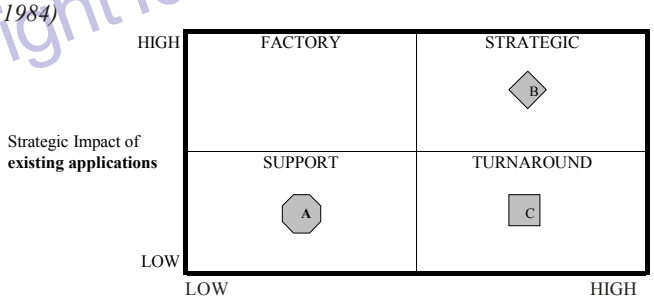
FINDING STRATEGIC IT APPLICATIONS

McFarlan (1984) proposed the *Strategic Grid* that allows the visualization of the relationship between IT strategy and business strategy and operations. This model analyzes the impacts of IT existent applications (present) and of applications portfolio (future), defining four boxes, each one representing one possible role for IT in the enterprise: "Support", "Factory", "Turnaround" and "Strategic" (Figure 1).

- "Support": IT has little influence in present and future company strategies.
- "Factory": existent IT applications are important for company's operations success, but there is no new strategic IT application planned for the future.
- "Turnaround ": IT is changing from one situation of little importance ("support" box) to a more important situation in business strategy.
- "Strategic": IT is very important in business strategy in the present and new planned applications will maintain this strategic importance of IT in the future.

In order to assess the strategic impact of IT, McFarlan proposed the analysis of five basic questions about IT applications, related to

Figure 1: Strategic grid of impacts of IT applications (McFarland, 1984)



the competitive forces (Porter, 1979): building barriers to the entry of new competitors in the industry; building switching costs for suppliers; changing the basis of competition; changing the balance of power in supplier relationships; creation of new products.

Thus, IT may present a smaller or greater importance, according to the kind of company and industry operations. In a traditional manufacturing company, IT supports the operations, since the enterprise would keep on operating even when it could not count on its IS (Information Systems). However, in a bank IT is strategic for business operations, since it is a source of competitive advantage and a bank cannot operate without their computerized IS.

Henderson and Venkatraman (1993) proposed the "Strategic Alignment Model" that analyzes and emphasizes the strategic importance of IT in the enterprises. This model is based on both internal (company) and external (market) factors. It is a framework for studying IT impacts on business and understanding how these impacts influence IT organization and strategy, as well as it enables to analyze the market availabilities of new Information Technologies.

Two fundamental concepts in this model are strategic fit (interrelationships between strategy and infrastructure) and functional integration (integration between business and IT, in the strategic and infrastructure aspects). The authors highlight that strategy should consider both internal and external domains of the company. Internal domain concerns with administrative structure of the company. External domain concerns with the market and the respective decisions of the company. Thus, according to this model, four factors should be considered for planning IT: (i) business strategy; (ii) IT strategy; (iii) organizational infrastructure and processes; and (iv) IS infrastructure and processes. The Strategic Alignment Model brings the premise that the effective management of IT demands a balance among the decisions about those four factors above. One important innovation of this model is IT strategy could come first and change business strategy, instead of the usually general belief that business strategy come before IT planning.

This planning should be a continuous process, since external factors are in permanent changing situation. If the company does not follow these changes, it will be in serious disadvantage in the fiercely competitive market. This is particularly true when a new technology is adopted by almost all companies in an industry, passing from a competitive advantage for those that have it to a disadvantage to those that do not use it.

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According to Henderson and Venkatraman, there are four main perspectives of strategic alignment, starting from business strategy or from IT strategy, as shown in Figure 2.

IT MANAGEMENT IN BRAZILIAN COMPANIES

This paper intended to verify if companies with significant IT strategic impact tend to develop more elaborated procedures concerned with effectiveness.

In order to investigate the IT role in Brazilian companies, the adopted methodological approach was multiple cases. The selection criteria were the following: local dispersion; different kind to manage IT; different IT strategic impact; and organizational structure and IT application complexity. Based on these criteria, three cases were selected, each one from a different industry: financial, telecommunication and building materials. Interviews were performed with many players from different hierarchic levels. Table 1 presents the characteristics of the analyzed companies.

It is important to notice that the focus in COMPANY "A" was restricted to a specific business unit, hereafter AN1, that achieved 60% of company total revenue.

The theoretical models used in effectiveness analysis were based on McFarlan and Henderson and Venkatraman approaches.

Figure 2: Perspectives of strategic alignment (Henderson; Venkatraman; 1993)

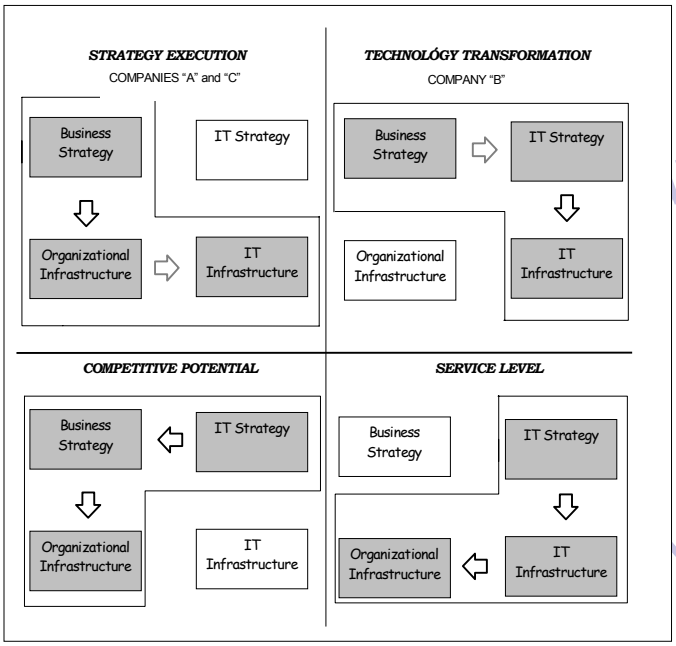

Table 1: Characteristics and IT analysis in the studied companies

Characteristic / IT ANALYSIS	COMPANY "A"	COMPANY "B"	COMPANY "C"
INDUSTRY	MANUFACTURING	FINANCIAL	MANUFACTURING
FOREIGN CAPITAL?	NO	NO	YES
BUSINESS AREAS	AGRIBUSINESS, BUILDING MATERIALS	MULTIPLE BANK	ELECTRONIC, SEVERAL PRODUCT LINE
REVENUE (M M US$)	400	4.500	2.000 **
NUMBER OF EMPLOYEES	6.000	17.000	2.700
BUSINESS UNITS?	YES	NO	YES
LOCAL DISPERSION?	YES	YES	YES
IT STRUCTURE	BY KIND OF SYSTEMS	CLIENT	PRODUCT LINE
IT OPERATION	DECENTRALIZED	CENTRALIZED	DECENTRALIZED
SYSTEM DEVELOPMENT	CENTRALIZED; INTERNAL	CENTRALIZED; INTERNAL	CENTRALIZED; OUTSOURCING
IT DECISIONS	CENTRALIZED; NOT SYSTEMATIC	DECENTRALIZED; SYSTEMATIC	DECENTRALIZED; SYSTEMATIC
REASONS FOR IT DECENTRALIZATION	LOCAL DISPERSION; BUSINESS UNITS; WISH FOR CONTROL	LOCAL DISPERSION	LOCAL DISPERSION; BUSINESS UNITS; WISH FOR CONTROL
IT PROJECTS CONTROL	AD HOC	STRUCTURED	PARCIALLY STRUCTURED
STRATEGIC GRID	SUPPORT	STRATEGIC	TURNAROUND
STRATEGIC ALIGNMENT	STRATEGY EXECUTION	TECHNOLOGY TRANSFORMATION	STRATEGY EXECUTION

* Brazilian branch ** Latin America

UNDERSTANDING IT ROLE IN EFFECTIVENESS

The effectiveness analysis through the Strategic Grid (McFarlan, 1984) allows classifying the appropriate position of each company, as illustrated in Figure 1.

In COMPANY "A", a traditional manufacturing, IT area adopts a support approach and there is no perspective of changing this role in near future. Existent IT applications, and also those planned for implementation in the short term, do not present strategic impacts. Hence, it should be classified in "Support" box of Strategic Grid.

COMPANY "B" is well known of its aggressive use of de IT resources and considers IT as inherent part of its operations and strategy, since the company cannot work without IT. Besides, all future business strategic plans rely heavily on the implementation and maintenance of IT applications. So, COMPANY "B" is classified in "Strategic" box.

Although COMPANY "C" is also a manufacturer, IT importance is different from COMPANY "A". There is a concern with efficiency of development, maintenance and implementation of IT applications. Due to a proposal of company organizational restructuring, characterized by a creation of new corporate areas and more centralization, the demand for better integration among business units is increasing. So, IT is moving from a support role towards a new position, with increased strategic impact, making possible the new structure and its operation in the enterprise. This situation justifies the choice of "Turnaround" box for this company.

Adopting Henderson and Venkatraman (1993) point of view, it is possible to verify which strategic alignment perspectives were used in each company, as shown in Figure 2.

In COMPANY "A", corporate and AN1 visions are that IT should provide the necessary IT infrastructure for the organizational structure that enables business strategy. So, the perspective is "Strategy Execution". However, alignment between business and IT is better executed in corporation than in AN1. The corporate IT area, that manages both corporate and business unit resources, negotiate directly with corporate direction, understanding much more its needs than those of the business units. Decisions of what will be implemented, which hardware or software will be bought are almost exclusive of corporate IT. The relationship between IT corporate and AN1 is *ad hoc*.

COMPANY "B" adopted "Technology Transformation" perspective, due to the search for new IT applications, especially those based on Internet, to allow a new strategy of closer relations with costumers. The company emphasized, in the 90's, the access of costumers through *home banking*, with specific software or by Internet. Both users and IT professionals, in a well-defined process, discuss the choice of IT investments and after the steering committee (composed by members of high direction of business and IT) decides which projects will be developed and their priorities.

COMPANY "C" also adopts "Strategy Execution" perspective", because it searches IT solutions for the new structure, that focuses on centralization of some functions

and on interaction among business units. Both business and IT strategies are globally defined, establishing parameters for local strategies. Thus, there is alignment between global and local strategies. This solution provides leveling of technologic possibilities in a worldwide basis. Although IT area is seen as an important agent for reducing costs, it is also considered an important support for business strategy and operations. Table 1 summarizes the analysis of effectiveness in the three cases.

CONCLUSIONS

Effectiveness analysis demonstrates that, only in COMPANY "B", IT is a source of competitive advantage, and clearly emphasizes effectiveness evaluation of IT projects. In the other cases, IT does not present the same strategic relevance, as was shown in McFarlan strategic Grid (Figure 1). However, COMPANY "C" status tends to change towards a more strategic position.

COMPANY "A" presents poor relationship between corporate IT and business unit; also, there is a lack of alignment between IT and business unit strategies. As discussed before, COMPANY "A" should keep IT in "Support" box, since the search for IT efficiency could be achieved through appropriate IT suppliers. Thus, there is an important possibility of increasing IT outsourcing, what would lead to "Service Level" perspective of strategic alignment, compatible with IT role in this business.

COMPANY "B" was classified in "Strategic" box, i.e., effectiveness of IT applications represents possibility of gains in competitiveness. Besides, this company would benefit from formal efficiency models for the development and maintenance of these applications. In this sense, it was confirmed the general idea that companies with IT strategic impact tends to use efficiency and effectiveness well structured procedures.

COMPANY "C", classified in "Turnaround" box, tends to drive the adoption of more detailed effectiveness evaluation systems, once this company has already demonstrated initiatives in using IT project efficiency.

Both companies "B" and "C" must keep strategic alignment perspectives, respectively, "Strategy Execution" and "Technology Transformation".

Further studies would necessary for a better and deeper understanding of the importance of IT effectiveness for the success of competitive companies. However, this paper intended to help to find a way for this understanding.

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