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IT diffusion in the Brazilian public sector: organizational culture versus efficiency

Introduction

The impact of Information Technologies (IT) diffusion on organizations has been a widely discussed subject. Albeit the consensus about the adoption of IT to increase firms' efficiency (Monk 1989, Porter and Millar 1990) sometimes results are below expectations. This is mainly due to the organizational culture of the firm. As Glaser (1994) points out, success of IT implementation depends not only on commitment from the CEO of the company, but also on the existence of "maestros" — dynamic individuals with technical and commercial abilities — and a technical group that supports development of solutions.

Organizational culture is also an important factor for IT diffusion in the public sector. Public service is not drawn only by a search of efficiency, since it is strongly affected by other factors. Bureaucrats fail to see clearly the results of their production since they have to provide diversified services on a broad time span. Bureaucrats also tend to be risk-averse (Stiglitz 1987), and have management decisions influenced by political factors (Vickers 1965).

The wide range of public services introduces differences in decision processes. State companies that are subject to potential competition from private firms tend to emulate those firms' behaviors, while public organizations, i.e., institutions involved in "classical" State activities like research foundations, urban planning agencies, libraries, etc., have centralized decision processes. In addition, companies that provide IT services for other state and public companies present some particularities concerning their decision processes, since they face competition but have binding obligations towards other public companies.

The question addressed in this paper is how state companies differ from public organizations and public IT providers in their decisions concerning IT adoption. In other words, we will discuss how organizational culture within the public sector can vary, and accordingly have different impacts on IT diffusion. The paper is centered in the case of Brazil, where the State has played a central role in the accumulation process (Bruneau and Faucher 1981; Evans 1979, Martins 1985, Tavares and Assis 1985), and thus has an expressive number of state companies. Results from interviews with managers of nine representative companies will be summarized. As a conclusion, we will discuss the main factors affecting diffusion of IT in the Brazilian public sector.

1. State companies

State companies in Brazil originated in the Second World War period, producing steel, motor engines and chemical products to cope with war-related shortages. State bureaucracy grew and became more complex after 1955, when a systematic policy of import-substitution, following the ECLA (Economic Commission of Latin America) program, took place. The State's role in industrial development was to support private industry, entering direct production only when considered necessary (e.g., "national interest" areas such as petroleum).

The authoritarian period that began with the military coup of 1964 favored increased levels of State intervention in the economy. Even when the free-market faction of the bourgeoisie dominated, the military strategy to transform Brazil into a world power ensured the continuity of state-directed development policies, giving increasing power to the technobureaucracy. State companies became more important in industrial production as the continuation of import-substitution policies raised investment needs. A strong Government procurement policy was also

defined during the seventies, giving priority to national equipment and service industries to supply federal agencies and state companies in 1969, as well as states and municipalities later.

External and internal indebtedness in the eighties imposed severe limits on State investment continuity. Limits on investment, equipment imports and current expenses of state companies were established to contract demand and attack inflation. State companies were used to attract external resources and attack inflation by controlling prices. They suffered financial problems as a result (Werneck 1987).

In 1990 the Collor government, following a free-market ideology, wanted to sharply reduce State intervention in the economy by privatizing state companies, lifting import controls and reducing subsidies. After Collor was impeached the pace of privatization of state companies was reduced, but there was a political consensus about the convenience of continuing privatization. Overall, between 1979 and 1993 the number of state companies was reduced from 207 to 149, and the participation of state companies' investment in total investment decreased from 23.1% to 10.0%. The present Government intends to pursue privatization to fight public indebtedness.

Thus, since the eighties state companies have been under pressure to increase their efficiency. Accordingly, they increased investments in IT during this period. The main benefits of IT for these companies are increase in velocity of operations and increase in quality. Main obstacles perceived are inadequate telecommunications infrastructure, dependency of political decisions and slowness in procurement procedures. Lack of IT culture was a problem in some companies when new systems were installed, but they were quickly solved by training programs. All managers interviewed favor a reform of state companies' organization, to give them more conditions of competitiveness with private companies. Reforms cited were

change in procurement and hiring procedures and end of political appointments to management positions.

Those reforms are important but they must be preceded by a change of the company's managerial philosophy. The case of Empresa de Correios e Telégrafos (ECT, the Brazilian postal service) shows how management strategy can lead to a change in organizational culture and to increased use of IT. ECT was rated as a very inefficient state company during the sixties. After a training program provided by France's PTT, the company proceeded to a radical reform of its operations that started in 1969. ECT stimulated retirement of old personnel, hired new employees and emphasized employee efficiency by constant training programs. It also decentralized its decision processes, giving more power to its regional offices. Another important measure taken during this period was standardization of procedures and lay-out rationalization. In 1976, for the first time, ECT reached equilibrium in its accounts. The company then diversified its operations to guarantee growth in revenues.

Although use of IT started in the seventies, it is only by the end of the eighties that ECT, facing financial problems caused by federal programs of austerity, started to consider IT as a tool not only to automate processes but also to increase quality of services. As a manager of the company remarks, the use of IT is today a tool to anticipate and solve critical situations and thus better serve customers. In 1991, when it began to face increased competition from private transport companies, ECT started a wide program of franchising, thus increasing the capillarity of its services. Efficiency in delivering and retrieving objects was guaranteed by the development of a network connecting postal offices and a mobile communication system to track objects. Today ECT is providing IT services to other state companies, as well as to public organizations, and is seen by customers as the most efficient public service. ECT's network is well developed, having one terminal per 16 employees in operations and one terminal per 5 employees in administration services. Its latest

step towards increased integration with the market by using IT is the creation of a home-shopping service that will allow customers to choose products by accessing a database and buy them by mail.

The case of ECT shows that state companies, although facing obstacles to competitiveness such as political inference and State regulation, can attain a high level of IT diffusion by having an organizational culture that favors IT implementation, pursuing quality of services and emphasizing training programs. Although political appointment of managers still exists, the company tries to minimize political inference by explaining clearly its philosophy to new managers and trying to win them to the company's goals, which can be summarized as guaranteeing the public access to services in the most convenient way.

As observed by Gullledge et.al.(1994), there are a series of factors critical for success in IT diffusion in public organizations: commitment from senior management, employee involvement and easy implementation of new ideas. ECT is following all these guidelines, hence its success in implementing IT.

2. Public organizations

We refer here to public organizations as institutions that develop "classical" activities of the public sector, like libraries, research foundations, planning institutes, etc. These institutions present a centralized decision process that hampers IT diffusion since it obeys political criteria, rather than aiming to increase efficiency. Thus, the main difference between those organizations and state companies is that the latter have decentralized decision processes that provide more autonomy from political factors in conducting the company, and thus guarantee the continuity of management strategies. Besides, the very fact that public organizations render services typical of Government increases difficulties in attaining efficiency of services. As Swiss (1992)

remarks, Total Quality Management programs in an unmodified form are ill-suited to the government environment, due to variety of services and variety of customer demands. Most authors that have studied impact of IT in public organizations stress the difference between automating procedures and developing networks. While the former does not necessarily lead to increased efficiency, the latter does, provided it supports changes in work and decision processes (Avgerou 1991, Bellamy and Talyor 1994).

Brazilian public organizations have been traditionally used as places to employ Government's protégés, normally in high positions at the hierarchy, thus leading to low motivations along its permanent employees. Low wages and lack of performance control are also common. This creates a vicious circle where skills of employees are low due to low salaries and they do not increase due to lack of motivation. The lack of organizational culture is therefore an important obstacle to introduce IT. Accordingly, our research found that main obstacles for IT diffusion perceived by public organizations were lack of organizational culture, inadequate telecommunications infrastructure and lack of resources to invest. Main benefits were increase in quality and velocity of operations and increased access to information. Albeit difficulties in adopting organizational procedures that increase use of IT, all the institutions studied intended to raise investments in IT, given its role in better serving customers.

Lack of organizational culture is linked to discontinuity of strategies concerning IT implementation. One typical case is that of a research sponsoring institution that started an ambitious program to put one PC in every desk and link them in a network that would replace the mainframe-based network. Buying the PC's took one year, and at the time they were installed the president of the organization left the post for political reasons. The new president thought that the organization had already spent enough in PC's and cancelled acquisition of cables to connect the

network. The result was the creation of several "islands of information": each group of employees started to use different PC softwares and different ways of organizing data. In addition, problems in the old network led employees to go back to manual procedures when they needed information linked to several departments, and to disregard updating of data in the network, thus aggravating its unreliability. Today, with a new president, the organization is proceeding to implement the PC network, but it reckons that the network acceptance by employees will be slower, since they are closed in their "islands of information".

However, not all public organizations have understanding presidents. What was observed in our research was that in most public organizations, there were employees responsible for innovative ideas and success of IT implementation. In other words, most public organizations had "maestros". The difference is that those persons had to act individually, with no support from the direction and a very limited technical group (sometimes trained by the "maestros" themselves). In some cases these "maestros" took the initiative to install new systems or procedures and only afterwards let the management know what was happening.

Public organizations in Brazil also have to cope with limited resources. In some organizations visited the managers were starting to develop new ways to raise revenues, such as creation and selling of databases and provision of services in association with other public institutions (thus sharing costs). These new ways lead to increased use of IT, as organizations use information created as a strategic resource, and not only as a service to the community. However, this trend is very incipient, and it is not clear whether it will attain all Brazilian public organizations.

In developed countries, there are three trends among public organizations that lead to increase in use of IT. The first one is to approach institutions and customers, the second is to integrate information from different institutions, and the third is to reduce

costs with public transactions (Bellamy and Taylor 1994). Brazilian public organizations are slowly following the first and the third trends.

3. Public IT providers

We define public IT providers as companies that provide data processing, database and networking services to other public companies. Public IT providers have been experiencing a significant raise in the demand for their services: between 1985 and 1992 the number of on-line inquiries to Serpro, the federal informatics services company, grew 1335%. These companies are very important for IT diffusion in the public sector since not only they use IT but also they can stimulate diffusion in other companies. Although they have a potential to commercialize their services to private companies and thus gain autonomy from the central Government, we observed that most IT providers have budgetary restrictions and regulations binding them to provide services to public companies. Data processing companies, on the other hand, have their budgets linked to state Governments' objectives. Thus there are wide financial disparities among companies, depending on the importance given to IT diffusion by each state Government. Last year, while the states of Rio Grande do Sul, Paraná, Mato Grosso, Sergipe, Ceará, São Paulo and Minas Gerais destined 3% of their budgets to their data processing companies, the state of Rio de Janeiro gave only 0.7%.

Serpro's case shows that the central Government has been using IT as a policy instrument only in some instances. The most remarkable are those of Siscomex, a system to make easier external trade procedures and thus stimulate exports, and the system to file tax returns, available to all tax payers. In both cases final users do not pay anything for using the system.

In addition, Serpro offers a variety of other systems to state and public enterprises: e-mail, human resources management, materials, price and furnishers database, export and import database, retail prices database. Those systems could be a significant source to raise Serpro's revenues, if commercialized to private firms. However, big users of Serpro like the Brazilian IRS, the Treasury, the Federal Administration Secretariat and the Justice Ministry do not support an opening of commercialization, for fear of a decrease in their services' quality. In the case of the retail prices database, which is very attractive to businesses, Serpro has managed to commercialize it in an agreement with Embratel, the federal long-distance telecommunications company. As is common in the telecommunications sector, regulation concerning public IT services provision is not clear and subject to different interpretations.

Thus, the main obstacles concerning IT diffusion in public IT providers stems from budgetary restrictions, lack of resources in some cases and absence of clear objectives since their clients' base is not well defined. The companies try to surpass these obstacles by forming associations to share experiences and by increasing links with other public companies that may support them in their fight for more autonomy from the State, including the power to decide who their customers will be.

4. Conclusions

In conclusion, the Brazilian experience shows that IT diffusion depends not only on resources to invest — which have been scarce in the Brazilian public sector in the last 20 years — but also on organizational culture, which shapes IT use, and on the regulation of IT public providers. The lack of organizational culture is the more important obstacle to IT diffusion in public organizations.

State companies have fewer problems with organizational culture than public organizations since they face competition from private firms and thus try to update their management philosophy. Today most state companies are adopting quality programs and are trying to disseminate an organizational culture aiming to increase efficiency. This is not the case with public organizations, where the bureaucratic rationale still prevails. Thus, Brazilian public organizations are still far from using IT to support changes in work and decision processes. However, understanding among public managers of the benefits brought by IT is increasing.

Finally, the problems faced by public IT providers stem from the restrictions to their operation imposed by Government. A market-oriented management that guaranteed more resources to those companies would eventually raise quality of IT services and thus benefit users from other public companies.

Thus, an increase in IT diffusion in the Brazilian public sector will depend not only on more resources to invest but also on a reform of management within the public sector. The reform, as suggested by Gullede et.al (1994), must involve employees in order to minimize the strain caused by cuts of budget and personnel. IT diffusion programs in the public sector must also have provisions for innovations created by employees that adjust IT systems to the public company environment. (Katz 1994)

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