

INSTITUTIONALIZATION OF AN INFORMATION SYSTEM THROUGH THE EXERCISE OF POWER

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Abstract: *The institutionalisation of an information system is possible only if it is sustained and*

legitimated by organizational actors and individuals. The system reviewed in this study, the SIAFEM – Integrated System for State Financial Administration, is a large governmental system adopted by the State of Sao Paulo as an accounting and cash management system. Once implemented, it became institutionalized and, subsequently, underwent an expansion as a result of new requirements and following the intervention of powerful actors who made use of it as a control and surveillance tool, thus sustaining its expansion.

This study intends to provide a better understanding of the process through which an information system can become institutionalised and subsequently expanded as a consequence of the exercise of power. The expansion of an information system sustained by actors who use it as an instrument to increase their power is a theme underdeveloped in the literature. Therefore, this study could represent a step further in the analysis of an institutionalised system.

Keywords: Information systems, Institutionalization, Exercise of power

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1. INTRODUCTION

The institutionalisation of an information system is possible only if it is sustained and legitimated by organizational actors and individuals. The system reviewed in this study, the SIAFEM – Integrated System for State Financial Administration, is a large governmental system adopted by the State of São Paulo as its accounting and cash management system. After being implemented and becoming institutionalised, it underwent an expansion due to new requirements and also the intervention of powerful actors who made use of it as a control and a surveillance tool, thus sustaining its expansion. The institutionalization and the sustained expansion of the system were based on an institutional discourse of efficiency and transparency. In the beginning, this discourse was used to implement and institutionalise the system, and later on, it was used by some actors to expand the system and develop new tools for establishment of an increased control over other actors' acts. Therefore, the system surpassed its initial envisioned use, becoming an empowering tool.

This study intends to provide a better understanding of the process through which an information system can become institutionalised and subsequently expanded as a consequence of the exercise of power by knowledgeable actors.

2. LITERATURE REVIEW

2.1. New Institutionalism

According to Scott (2001),

Institutions consist of cognitive, normative and regulative structures and activities that provide stability and meaning to social behavior. Institutions are transported by various carriers – cultures, structures and routines – and they operate at multiple levels of jurisdiction. (p. 33). The cognitive elements include widely held beliefs and taken-for-granted assumptions that provide a framework for everyday routines. The normative elements incorporate habits and informally sanctioned social obligations including rulings of legislatures and enforcement mechanisms of the regulatory agencies.

According to DiMaggio and Powell (1991) the new institutionalism in organizational analysis emphasizes the ways in which action is structured and order is made possible by shared systems of rules that both constrain and privilege certain groups whose interests are guaranteed by prevailing rewards and sanctions. It is a theory of stability and it is concerned with “persistence rather than change and the legitimacy imperative acts as a source of inertia” (YANG, 2003). Thus, Yang (2003) points out the “neoinstitutionalism’s immaturity and ambiguity in accounting for institutional change.” Neoinstitutionalism has a relative inattention to institutional change and its process, which remains a “black box” (Zucker, 1983). According to Hasselbladh and Kallinikos (2000), the theoretical formulations of neoinstitutionalism are often too idealistic and broad to direct empirical research. In spite of this, the theory is still relevant to explain the institutionalization of an information system and will be adopted as a basic framework for our analysis.

The new institutionalism does not consider the individual actor, who can only participate in an action enacted by more ample entities. In an example given by Scott (1994) an individual can only vote if an election process is established. Therefore, for the new institutionalists, the behaviour of an individual has to be analysed as part of a broader phenomenon as in the cited example. Consequently, the new institutionalism gives no voice to the individual actor and considers interest groups, organizations and associations as collective actors. Social processes and changes result from actions and interactions between actors on a larger scale.

Institutional theory became particularly relevant for IT studies by contributing with a new perspective for the interaction between human beings and the technology, as well as the form by which this interaction acquires legitimacy and becomes institutionalized requiring, however, additional models to study the relationship between power and agency of individual actors.

2.2. Power and Information Systems

Jaspersen et al. (2002), after analyzing the published papers related to power and information technology concluded that “power is clearly a complex phenomenon that can be viewed and best understood from multiple layers.” Concerning power relations, “IT can be used to reinforce current power structures or to mold altered structures.”

Silva and Backhouse (2003) integrated different conceptions of power into a theoretical framework for the study of the institutionalization of information systems. According to these authors, the exercise of power is necessary to institutionalize an information system, which, once in place, becomes itself a source of power.

According to Scott (1992), institutional research cannot be confined to the organization, but has to take into account other themes, such as power and control, stratification and inequality, the social construction of meaning and reality and also the external environment.

3. RESEARCH QUESTION

The change from the initial sponsor’s exercise of power for the implementation and institutionalization of the system to the intervention of new knowledgeable and powerful actors for the system’s expansion and sustenance triggers the paper’s research question:

Which processes and agents can favour the expansion and sustenance of an information system?

4. METHODOLOGY

The study was conducted as an exploratory interpretive case study research. According to Walsham (1993):

... Interpretive methods of research start from the position that our knowledge of reality, including the domain of human action, is a social construction by human actors [...]. Thus there is no objective reality which can be discovered by researchers and replicated by others.

Orlikowski and Baroudi (1991) add that interpretive studies “[...] try to understand phenomena through accessing the meanings that participants assign to them.” Such studies thus seek a relativistic and shared understanding of phenomena.

According to Klein & Myers (1999), interpretive research assumed that our knowledge of reality is gained only through social constructions such as language, consciousness, shared meanings, documents, tools and other artefacts.

4.1. Data Collection

The information sources used in this study are historical documents (academic theses, books, newspapers and magazines), as well as governmental laws that imposed the implementation of the system and related organizational changes. Additionally, twenty-seven semi-structured interviews were conducted with managers responsible for the implementation, with users, the support staff and the helpdesk team. Each interview lasted at least two hours, was recorded and then transcribed. Inconsistencies or misunderstandings were discussed over the phone with the interviewees. The historical documents and the interviews were analysed using hermeneutics as a theoretical perspective.

The principles of the hermeneutic circle, described by Klein and Myers (1999), were applied to this case study in order to build an understanding of the phenomenon.

5. THE CASE STUDY

5.1. The Political and Economic Context

After years of high inflation, the Country's economic stabilization in 1994 provided the possibility for effective government planning, budgeting, financial management and control.

In this line the São Paulo State government implemented SIAFEM, a new accounting and cash management system, as part of a broader administrative and financial reform, as a response to the existing chaotic public administration situation and the lack of reliable information for decision-making.

In fact, until 1995, governmental planning and budgeting process and the State's cash flow management had been very imprecise. Prodesp, the São Paulo State data processing company, operated an outdated mainframe-based accounting system that could not provide timely management information. As a rule, departments were hampered by the lack of decision-support systems and their staff had poor computer literacy. Extremely high inflation rates in Brazil before 1994 also had made forecasts almost useless.

In 1995, the new elected Governor perceived the importance of information technology for the modernization of the State's administration. Therefore, he and requested the Secretary of Finance to set up a budget and financial control system, resulting in the option for SIAFEM, a system developed by the Federal Government for use by States and Municipalities, that had been in successful operation for two years in a medium-sized city.

5.2. The Implementation of SIAFEM

The Department of Finance's team responsible for implementing SIAFEM concluded that it would also require significant organizational changes. The adoption of the SIAFEM throughout the State Administration was imposed by law and the Governor expected the system to be implemented in mere 45 days in 684 major governmental entities. Prodesp became responsible for acquiring and installing microcomputer and the leased phone lines that would link all Departments to a central computer system. The high cost and low quality of the telecommunications became an additional challenge to the project.

In the beginning, Prodesp had been opposed to SIAFEM, because it was not based on its preferred client-server architecture, but had to follow the Governor's decision. An

international funding agency and the State Government provided the required resources for the project.

The former accounting system had been centralized, and only accountants were familiar with its workings. The implementation of the new system changed the tasks in all financial sectors since it required the direct recording of all Departments transactions in the system. As a result, clerks had to learn both how to operate microcomputers and how to interact with SIAFEM. Additionally, they would become personally responsible for the data recorded into the system. Some officials became very dissatisfied with the new system because part of their knowledge would be inscribed into the SIAFEM processes and they would be left to carry out only unskilled routine tasks.

In some Departments, there were clerks who refused to work with the new system. Those who were near retirement age decided to retire. However, they would not have to be replaced due to the new system's level of automation.

After the implementation, the Governor's constant demands for more control led to the in-house development of a new system, called SIAFISICO (the Registry of Materials, Services and Vendors, and a Price Databank). This system contained data about prices and quantities of all goods and services acquired by the State Administration. With this system, the Department of Finance began to make statistical analyses of all prices paid by governmental agencies, inducing them to become much more careful in their acquisitions.

Once SIAFISICO had become operational, the implementation of BEC (the Electronic Procurement Exchange) became feasible. This system changed significantly the relationship between government and its suppliers. Governmental agencies frequently delayed payments to suppliers, leading these to become less interested in dealing with the government. This had reduced the number of suppliers and the level of competition. The implementation of BEC reverted this situation by increasing the number of potential suppliers and permitting the government to negotiate lower prices for goods and services in return for prompt payment. The availability of all purchase history data on SIAFISICO brought transparency to the process, allowing a better control of competition and prices paid.

SIAFEM is basically a transaction processing system, with limited management tools. Therefore, the government decided to develop a new Executive Information System (SIGEO) that would allow data mining and customized management reporting. Data recorded in SIAFEM and in SIAFISICO are regularly replicated into SIGEO and are available to all Departments over the governmental Intranet.

Integrated with the SIAFEM, the State's Department of Planning developed various other systems, used for planning, budgeting and cash flow control, historical analyses and the preparation of law proposals for budget amendments, financial and physical control of projects and contracts.

Two years after its implementation, SIAFEM could be considered stabilized and institutionalised, as the outcome of a two-staged process:

- Imposition of the system, with the de-institutionalization of old bureaucratic administrative practices and the disempowerment of officials whose power was based on those practices.
- wide-spread use of the system; its institutionalization triggering organizational and cultural changes; empowerment of knowledgeable officials through the availability of information; increased surveillance over the acts of the civil service staff, modernization of public administration and the expansion of the system, through the development of other centralized and local applications.

The dual process of the de-institutionalization of old practices and the institutionalization of SIAFEM is analyzed using the lens of the new institutionalism theory.

The process engendered organizational and cultural changes triggered by officials' cognition and awareness about information availability. For some Departments, SIAFEM was just a replacement for the old accountancy system and therefore they did not in principle oppose the new system. It had for a long time been institutionalized that government entities had to work with the State's former centralized accountancy system.

For other Departments power played a fundamental role in the process of institutionalization of the SIAFEM and its further expansion.

5.3. The Change Process

a) *Imposition of a system that would be responsible for de-institutionalizing old bureaucratic administrative practices and the disempowerment of officials whose power was based on those practices.*

SIAFEM was imposed on all Departments by a State law. Due to the short period of time between the initial decision and its effective implementation, a chaotic situation developed at all Departments of the State Administration since in some of them there were no microcomputers or network connection available. Most civil servants were computer illiterate and had to learn how to work with computers in general and with the new system specifically.

The Department of Finance set up a Help Desk Centre available to all users. In the early stages, however, according to the interviewees, it was almost impossible to get any help from them because their phone lines were always busy. Moreover, the transmission rate of the leased lines was very slow and the system was unstable, contributing to the chaotic process of implementation. Due to operational problems, several transactions had to be corrected after the system was made available. In fact, in some cases, the users had even to re-submit all their transactions.

The implementation process required cultural changes not only within the Department of Finance, but also in all other Departments. Given the generalized computer illiteracy and the change in the functions to be carried out by the staff members of the financial sectors, some of them developed a huge resistance to the use of the new system. Their very skilled work before the implementation of SIAFEM was now replaced by unskilled clerical tasks, since all their knowledge about public finances had been inscribed into SIAFEM's transactions.

In some Departments, officials began to resist the system because they felt that it would lead to their disempowerment and also to staff reduction.

According to Meyer and Rowan (1977), any organizational change has to deal with "rational myths", defined by the authors as powerful rules, understanding and significance related to social institutionalized structures. According to these authors, people believe in institutionalised myths, rules and procedures that are then capable of shaping organizational arrangements independently of the flow of resources and their technical requirements.

Some radical measures were taken in order to face the rejection process. The project manager at the Department of Finance mandated that all typewriters of its Accounting Division be donated and that paper-based documents would no longer be accepted. At some Secretaries, resisting officials or those unable to solve their local problems that occurred during the implementation process had to be replaced before the system could be adequately implemented.

SIAFEM came to replace the old and well established accountancy system, with strongly institutionalized work practices. According to Berger and Luckmann (1967),

“institutionalization occurs whenever there is a reciprocal typification of habitualised actions by types of actors... they cannot be created instantaneously. Institutions always have a history, of which they are the products.” (p.72-73).

A system is institutionalized when it becomes an obligatory passage point. For SIAFEM’s implementation it was necessary to reinstitutionalize the governmental accountancy system. According to Jepperson (1991), “reinstitutionalization represents an exit from one institutionalization and entry into another institutional form, organized around different principles or rules”. (p. 145).

Special SIAFEM training courses were developed for the Departments’ staff. The Department of Finance informed all other Departments that the new system would definitely be implemented, and without this training their staff would not be able to access their budget resources. For these servants this was a radical change in their work practices. Their knowledge would no longer be needed. In some cases it led to staff being dismissed or relocated to other sectors.

As emphasized by Barley and Tolbert (1997), “organizations and individuals who populate them, are suspended in a web of values, norms, rules, beliefs, and taken-for-granted assumptions that are at least partially of their own making”. In fact, the implementation of a system that would demand a radical organizational change is supposed to deal with internal resistances. The de-establishing of old rules and practices becomes a complex task due to the taken-for-granted assumptions about the old system and/or old practices.

Almost all interviewees complained about the new system. According to one financial manager, the training program was insufficient, the system was unstable in the beginning, the leased lines very slow and the number of available computers insufficient.

Managers, whose power derived from bureaucratic practices, were particularly affected by SIAFEM, since the new system deprived them of their power. Transparency was the new discourse used by the Governor to impose the system; but people were well aware that a new tool for continuous surveillance was being implemented. The system’s survival was guaranteed by coercive power characterizing the moral legitimacy that, according to Suchman (1995) “reflects a positive normative evaluation of the organization and its activities”, resting on judgments about whether the activity is “the right thing to do”

In the Department of Planning there was no resistance to the new system since it was understood that once the SIAFEM became fully operational that department would play a more powerful role in governmental decisions. Therefore, its maintenance was guaranteed by pragmatic legitimacy, defined by Suchman (1995) as being provided by constituents that “support the organization, not necessarily because they believe that it provides specific favourable exchanges, but rather because they see it as being responsive to their larger interests”.

Therefore, the maintenance of the system was guaranteed by coercive power and supported by powerful actors. The Governor provided support to the Department of Finance which was capable of imposing norms and furthering changes within the State’s Departments. The availability of information also originated a “second wave of power”, since some managers acquired power thanks to the development of their own autonomous systems, based on SIAFEM data. The development of these systems was fundamental for the consolidation of this type of power.

b) Wide-spread use and expansion of the system triggering organizational and cultural changes; empowerment of knowledgeable managers through the availability of

information; increased surveillance over the acts of civil servants and modernization of public administration

The constant demands by the Governor for more control and a constant concern with cost led the Department of Finance to implement in 1998 the systems SIAFISICO and SIGEO, after SIAFEM had been stabilized and legitimized by the governmental entities, i.e., after its institutionalization. Thanks to SIAFEM and SIAFISICO, it was possible to build BEC, the Electronic Procurement Exchange.

The Department of Planning developed various performance indexes based on SIGEO, which are used for auditing the expenses of the Departments.

The generalized legitimization of SIAFEM led the Department of Planning and other State agencies to continuously add new management and transactional applications, e.g.:

- The financial manager of the Department for Environmental Affairs began to build indices based on SIAFEM data, which helped convince his divisions to make a good use of their budget or to redistribute the remaining budget among other divisions as a way of better managing their available budget.
- Another application at the Department for Environmental Affairs uses data gathered from SIAFEM, SIAFISICO and SIGEO to create indicators, which keep track of expenses (prices and quantities) incurred by the Department.
- The financial officer of the Department of Health uses data available from the SIGEO to manage the departmental budget. An application was developed to build historical series of hospitals expenses, to monitor these expenses and detect anomalies. He has no power over the directors of the hospitals but by putting the available data to good use the financial officer was empowered and became an essential actor within the structure of the Department.

The financial officer of the Department of Public Security had always been a powerful actor, even before SIAFEM. In his Department, the system became an administrative surveillance tool, used to control staff and decentralized purchases (price histories and comparisons).

In general, the Secretary of Finance now wields increased power over the Departments by auditing more effectively their expenses.

Each one of the systems developed by the Department of Planning and by the Department of Finance increases the surveillance over public expenses. The Departments are also frequently audited by: the Department of Planning, the Department of Finance and the State Audit Court. The discourse used by the Governor was “transparency” but the system unveiled the power differences among several Departments. In fact, the increased knowledge about the expenses of the Departments turned the Secretary of Planning into a powerful actor. Knowledgeable actors continuously refine their control over other servants’ acts based on institutional discourses perpetuating the empowerment cycle. However, this control refinement and empowerment based on the expansion of the system was only possible after the system’s institutionalisation. Some Departments were capable of building systems based on SIAFEM and SIGEO and can now count on good management tools. Others complained that SIGEO is extremely complex and that they need special training to make use of it and had to ask the Department of Planning whenever they needed a special report. This fact confirms the stated by Kallinikos (2006) that information combinability is conditioned by a variety of social factors that can shape the work patterns within which information processes are developed.

In some Departments servants interested in using SIGEO, could not use it because their managers did not want to acquire new SIGEO licenses in order to retain control over information, perceived by them as a basis of power.

Cultural change in the Departments required more time than adoption of the system. The information available through the SIAFEM took a long time to be used, although many servants working with budget control quickly saw the new possibilities of the new system. Departments' managers, however, took longer to recognize them.

From a cognitive perspective, Scott (2001) emphasizes that "institutions are not so much a bundle of regulations or collections of norms, but knowledge systems" where "people don't discover reality; they create it".

Some Departments were capable of making good use of resources and developed systems to automate their work, thus collaborating with the expansion of the SIAFEM. In spite of the initial resistance offered by some public servants, it is now widely acknowledged that they cannot live without SIAFEM. Analyzing the differences in knowledge triggered by the system it is possible to confirm Scott's (1994) statement: "institutionalization is primarily a cognitive process that gives rise to distinctive conceptions of social reality."

After SIAFEM had been in use for some time, old practices were progressively de-institutionalized while the new system became institutionalized and acquired legitimacy. As stated by Avgerou (2000):

...Through institutionalization, an innovation is adopted and maintained because of its acquired legitimacy, irrespective of whether or not it produces its promised technical value, and without having to rely continuously on powerful personalities.

The institutionalization of SIAFEM can be classified as "acquiescence" according to Oliver's conceptualization (Oliver, 1991) since acquiescence may include habit, imitation or compliance.

Habit refers to unconscious or blind adherence to preconscious or taken-for-granted rules or values...organizations reproduce actions and practices of the institutional environment that have become historically repeated, customary, conventional, or taken-for-granted (OLIVER, 1991).

After this legitimization, the expansion of the system continued to be sustained by interested powerful actors (specially the Secretary of Finance, the Secretary of Planning and the Governor) and it enabled these actors to develop new systems. Some Departments, especially Health and Environmental Affairs, were empowered by using SIGEO and SIAFEM for refining their analyses. In contrast, some other powerful actors use the system more as an instrument of surveillance to audit the expenses of their Departments. Knowledge was the base of power for them. Through the combination and use of the available data, these actors were capable of structuring their actions in order to become powerful through the knowledge derived from the information available.

According to DiMaggio (1991), institutionalization is a process through which organizational actors, when making their rational decisions, build around themselves an environment that limits their future ability to implement change. Additionally, as stated by the same author, organizational structures and practices are maintained by the active efforts of those who benefit from the change.

Once a system is institutionalized, it becomes ingrained in the practices and roles of individuals, and tends to be sustained and perpetuated by them. From then on, other alternative systems become unthinkable, and institutional inertia is created. Berger and Luckmann (1967) explain the process of institutionalization based on peoples' perceptions about facts and practices: "individuals in their interaction with human beings build cognitive systems. However, as time passes by, these cognitive systems are taken as external and objective structures that enable and define their social reality."

The officers who had introduced SIAFEM left Government in 2001, after an organizational change in the Department of Finance that dismantled the sector responsible for the innovations. Even the training programs were discontinued. The system survived this crisis, proving that it had become institutionalized. As stated by Avgerou (2000), “a system can be considered institutionalized when its existence is not depending anymore of powerful actors”.

The Department of Planning is still improving control and modernizing services. There is a good integration of this Department with the Department of Finance and they are working together to modernize the administration of the system.

At present, there is no provision for technological changes in the SIAFEM. It is a user-unfriendly system with a mainframe-based interface. In the future, any upgrade trying to integrate this system with other governmental systems will become a difficult task.

6. CONCLUSIONS

SIAFEM has enabled an organizational change in all Departments and expansions of the system. These expansions, however, did not occur in all Departments. This fact can be attributed to the lack of vision of some Departments that interpreted the system only as an operational tool and did not visualize the importance of the information gathering tools provided by the system.

Power has played a fundamental role for SIAFEM's legitimization and its institutionalization. Initially, coercive power was used to impose the system. Later on, it was expanded and sustained by powerful actors that made use of institutional discourses to develop new systems and impose them for refining their control and surveillance over Secretaries and servants' acts. Therefore, the institutionalization of the system was promoted by the exercise of power by the Governor. However, its further expansion was also based on the exercise of power, but by other individual agents capable of imposing new rules based on institutional discourses. These knowledgeable agents played a fundamental role in the expansion and sustenance of the system, since they used the governmental discourse to develop their systems and enhance their power over other actors' or agencies.

REFERENCES

- AVGEROU, Chrisanthi.(2000). IT and organizational change: an institutionalist perspective. *Information Technology & People*, 13, n. 4, 234.
- BARLEY, S. R., & TOLBERT, P. S. (1997). Institutionalization and structuration: Studying the links between action and institution. *Organization Studies*, 18, n. 1, 1997.
- BERGER, P. L., & LUCKMANN, T. (1967). *The social construction of reality*. New York, Doubleday.
- DiMAGGIO, Paul, J., & POWELL, Walter, W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48.
- DiMAGGIO, Paul, J. (1988). Interest and agency in institutional theory. In: ZUCKER, L. G. (Org.) *Institutional patterns and organizations: Culture and environment*. Cambridge, MA: Ballinger.

- _____. (1991). Isomorphism and Collective Rationality in Organizational Fields. In: *The New Institutionalism in Organizational Analysis*. Chicago: The University of Chicago Press: pp. 63-82.
- HASSELBLADH, H. & KALLINIKOS, Jannis. (2000). The process of rationalization: a critique and re-appraisal of neo-institutionalism in organization studies. *Organization Studies*, 21, n. 4, 197-220.
- JASPERSON, Jon, S. & CARTE, Traci, A. & SAUNDERS, Carol, S. & BUTLER, Brian, S. & CROES, Henry, J. P. & ZHENG, Weijun. (2002). Review: Power and Information Technology Research: a metatriangulation review. *MIS Quarterly*, 26, No. 4, 397-459.
- JEPPERSON, R. L. (1991). Institutions, institutional effects and institutionalism. Powell W., W., & DiMaggio, P.J. (Org). In: *The New Institutionalism in Organizational Analysis*. University of Chicago Press.
- KALLINIKOS, Jannis. (2006). Information out of information: on the self-referential dynamics of information growth. *Information Technology & People*, 19, n. 1, 98-115.
- KLEIN, Heinz & MYERS, Michael. (1999). A Set of principles for conducting and evaluating interpretive field studies In Information Systems, *MIS Quarterly*, 23, n. 1, 67-94
- MEYER John. M. & ROWAN Brian. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, 83, 340-363.
- OLIVER, Christine. Strategic Responses to Institutional Processes. *The Academy of Management Review*, 16, No. 1, 145-179.
- ORLIKOWSKI, Wanda & BAROUDI, Jack, J. (1991). Studying Information Technology in Organizations: Research Approaches and Assumptions. *Information Systems Research*, 2, n.1.
- SCOTT, Richard, W. (1992). From technology to environment. In: *Organizational Environments: Ritual and Rationality*. Sage Publications, Inc.
- _____. Institutions and organizations: toward a theoretical synthesis. (1994). In: SCOTT W. R. & MEYER J. M. (Org). *Institutional Environments and Organizations: Structural complexity and individualism*, pp. 408-421, Thousand Oaks, CA: Sage Publications, Inc.
- _____. (2001). *Institutions and organizations: theory and research*. 2nd ed. Thousand Oaks: Sage Publication, Inc.
- SILVA, L. & BACKHOUSE, J. (2003). The circuits-of-power framework for studying power in institutionalization of information systems. *Journal of the Association for Information Systems*, 4, n.6, 294-336.
- SUCHMAN, Mark, C. (1995). Managing Legitimacy: Strategic and Institutional Approaches. *Academy of Management Review*, 20, no. 3, 571-610.
- WALSHAM, Geoff. (1993). *Interpreting Information Systems in Organizations*. Chichester: John Wiley.

YANG (2003). Neoinstitutionalism and e-government: beyond Jane Fountain. *Social Science Computer Review*, 21, n. 4, 432 – 442.

ZUCKER, Lynne. G. Organizations as Institutions. (1983). In BACHARACH, Samuel, B. (Org). *Research in the Sociology of Organizations* 2, 1-47. Greenwich, CT: JAI Press.