Bringing Change in Government Organizations: Evolution Towards Post-Bureaucracy with Web-Based IT Projects

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BRINGING CHANGE IN
GOVERNMENT ORGANIZATIONS:
EVOLUTION TOWARD POST-BUREAUCRACY WITH
WEB-BASED IT PROJECTS

Le changement dans les organisations gouvernementales: Une évolution
vers la post-bureaucracie avec les technologies de l’information

Completed Research Paper

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Abstract

This paper examines the following question: How do government organizations become more “post-bureaucratic” with web-based IT projects? It draws on evolutionary thinking to conceptualize processes of change in government organizations as involving sequences of variation, selection, and retention as well as to identify various sources of change: internal ones (e.g. administrators), as well as external ones (e.g. technological innovations and institutional pressures). The paper relates findings from four in-depth qualitative case studies of web-based IT projects in different government organizations. The interpretation of these findings helps expand the evolutionary conceptualization by suggesting how different sources of change interact in the change process and variously affect different stages of the evolution.

Key words: variation, retention, selection, path-dependency, institutions, post-bureaucracy, web-based IT project, interpretive case studies, government

Résumé

Cette recherche s’interroge sur les processus d’évolution des organisations gouvernementales lorsqu’elles mettent en place des technologies de l’information. Quatre études de cas illustrent comment différentes sources de changements interagissent et contribuent à l’émergence d’une organisation post-bureaucratique.
Introduction

Government organizations are organizations that accomplish government functions (e.g. public administration, departments of finance, local governments). They are not traditionally organized or regulated in the same way as firms from the competitive private sector. Government organizations are subject to specific constraints and do not claim profit seeking as their main objective. So far, most of the interest of studies on Information Systems (IS), management and change studies has been on organizations from the profit-seeking sector. Yet, government organizations are prevalent forces in economy and society of developed and developing countries. In most developed countries, government organizations employment represents more than 15% of the total workforce (Gregory & Borland, 1999). In the US alone, according to the 2006 census survey, about 19 million people work for the Federal, state, or local government.

Government organizations have been facing dramatic transitions, in part related to the increasing implementation of web-based Information Technology (IT) projects. Indeed, the development and increasing deployment of web-based IT projects has long been seen as deeply transforming economies and societies, leading way to a “knowledge society” where information and knowledge circulate laterally easily and freely (Castells, 1998, 2001). These transformations are likely to affect government organizations as well. However, how these transformations unfold has not yet been much investigated in the literature.

Web-based IT projects are characterized by their openness and user-friendliness, which may seem to go against the tradition of hierarchical structuring and vertical decision making in government organizations. Moreover, the trend towards free circulation of information and ideas may contrast with established organizing principles of government organizations. At the same time, web-based projects create unique opportunities for profound transformations in government organizations (Irani, Love, & Montazemi, 2007), especially as citizens expect more services to be provided over the internet. Taken together, these trends have been related to the emergence of so-called “digital government” and “post-bureaucratic” organizations (Binz-Scharf, 2003; Lee, Tan, & Trimi, 2005; Marchionini, Samet, & Brandt, 2003). “Post-bureaucratic” organizations are usually meant as a contrast with the bureaucratic model of government organizations, especially as web-based IT applications are being implemented (Fountain, 2001).

This paper examines the following question: How do government organizations become more “post-bureaucratic” with web-based IT projects? In particular, it investigates the following two sub-questions: 1) which factors condition this change process? And, 2) how do these factors relate to each other in the change process?

In order to provide some elements of answer to these questions, this research interprets observations from four qualitative case studies of web-based IT projects in different government organizations from an evolutionary perspective. Evolutionary theorizing corresponds to a set of theoretical frameworks brought together by their focal interest in understanding how change happens through a combination of various sources of change, whether these sources are internal to the organization or arise from its environment (Nelson & Winter, 1982, 2002).

In what follows, we first present an evolutionary perspective on IT-related change in government organizations. We then summarize key observations from the four field settings investigated in this research and present elements from the data collection and analysis. We then detail some important observations from the case studies and interpret them in an evolutionary perspective. In the discussion section we deepen the observations and expand the evolutionary conceptualization of the transformation of government with web-based IT projects. The conclusion summarizes the paper, acknowledges its limits, and points to its main contributions.

An evolutionary perspective on IT-related change in government organizations

We rely on an evolutionary framework in order to investigate change processes in government. This framework provides a theoretical lens to investigate changes as they unfold, focusing on the many sources

of change and on its conceptualization of the process as involving three inter-dependent stages of “variation, selection, and retention”.

**An evolutionary perspective**

Evolutionary thinking takes its roots from genetics (e.g. gene evolution in response to changes in the environment) as well as from seminal and radical economists who studied long-term productive and institutional transformation, such as Adam Smith, Karl Marx, and Joseph Schumpeter (Nelson & Winter, 1982). Evolutionary theorizing conceptualizes change in a non-deterministic manner (Dosi & Nelson, 1994; Nelson & Winter, 2002). Evolutionary theory has usually mostly focused on the impacts of technological innovation in technologies of production for industrial organizations (see, for example, Abernathy & Utterback, 1975; Anderson & Tushman, 1990). However, the perspective is also relevant for IT innovation, since IT dramatically increases information storage and processing capabilities, as well as deeply transforms the patterns of communication and transactions within and across organizations (McKenney, 1995).

In the evolutionary perspective, change follows processes of variation, selection, and retention (Dosi et al., 1994; Nelson & Winter, 1982). This process of change happens at multiple, inter-related levels, such as at the levels of individual practices or community routines, organizing processes, or industry characteristics (Aldrich & Ruef, 2006; Feldman, 2000; Gattani, 2005; Pavitt, 1984). Even though most evolutionary studies have focused their attention onto transition processes of variation and selection (e.g. how routines change over time), the evolutionary perspective can also account for retention of routines and organizing principles (Feldman & Pentland, 2003). In this view, retention involves that structures and other organizing principles are “stabilized-for-now” rather than once and for all (Schryer, 1993). If internal and external conditions remain roughly stable, the structuring and routines of the organization have no a priori reason to change dramatically. Yet, change is bound to happen as these conditions are always in flux. In this regard, an evolutionary perspective is especially relevant to investigate IT-related changes because it addresses the need to take into consideration the temporal aspect of such changes (Orlikowski, 2002; Winter & Taylor, 1996).

More generally, an evolutionary perspective also conceptualizes the evolution of organizations as a co-evolution of organization and its environment (Burgelman, 1991; Lewin & Volberda, 1999). This idea of co-evolution is especially useful to understand adoption of new technologies and objectives of organizational renewal that often come with it. For instance, Tan and Pan (2003) analyzed a transformative IT initiative in a bureaucratic context and took in consideration the relationships between the organization and its shareholders as a key to the organization transformation stemming from IT adoption.

Closely related to these ideas of temporal changes and co-evolution, evolutionary thinking also introduces the notion of path-dependency, i.e. the idea that current changes are dependent past actions and existing structuring principles (Nelson et al., 2002). Path-dependency is consistent with the idea of non-deterministic change and as well as, more generally, with the structurationist and practice perspectives on IT and organizations (DeSanctis & Poole, 1994; Orlikowski, 2000, 2002). An evolutionary perspective does not predict with certainty results of change related to IT. Rather, it helps uncover processes through which change happens as well as untangle key relationships among the key factors (e.g. internal, environmental, technological) that affect processes.

In this regard, evolutionary theory conceptualizes change processes and their results. Processes of change take place through exploration of radically new processes, innovation, etc. and / or as exploitation of what has already been routinely established (March, 1991). Exploration and exploitation are dual dimensions of change processes (Benner & Tushman, 2003). While exploitation trends flow from past actions, in a path-dependent way, exploration ones involve attempts to break free from the current state of routines. IT implementation can be related to both exploration and exploitation type of learning (Kane & Alavi, 2007); its effect is contingent upon which specific technologies are implemented, the organizational context, the industry-context and the emergent and reflective processes of use and transformation of routines that unfold (Boudreau & Robey, 2005).

**The evolution of government organizations with web-based IT projects**

Consistent with its roots in economics, evolutionary thinking has so far been mostly applied to examine the behavior of firms engaged in competitive environments (Dosi et al., 1994; Nelson et al., 1982). Evolutionary theory has especially put forward selection mechanisms within competitive environments, in
which survival depends critically on the level of fitness of an organization with regards to its environment. There has also been a seminal investigation of the evolution of policies that government organizations produce (Nelson, 1977). Overall, however, so far an evolutionary perspective has not been much used to characterize the processes of changes experienced by government organizations as they implement new IT.

Government organizations have been the subject of much investigation in organizational, sociological and management studies. Especially, government organizations have been viewed as typical examples of (Weber, 1922) bureaucratic organizations. Their large size, complexity, high degree of formalization as well as the strict vertical separation have been interpreted as making them “coercive” or “enabling” (Adler & Borys, 1996). Moreover, despite their high degree of formalization, bureaucracies are not a static organizational form. Their transformation relies deeply on interpersonal relationships (Blau, 1963) as well as onto the formalization of procedures that, in some situations, can support workers’ learning (Adler, 1993).

An evolutionary perspective can help conceptualize the processes currently affecting government organizations. This perspective, in particular, can also help conceptualize IT-related change in government organizations, which is likely to increase the duality between the “coercive” and “enabling” dimensions in bureaucracies. Indeed, the use of IT can bring with it lateral communications and trends toward more decentralized information processing if not decision making that a priori seem contradictory with traditional bureaucratic structures (high centralization and more vertical information exchanges than lateral ones). However, technology implementation and use also often offer opportunities for both the transformation of organizing as well as for the reproduction of such structural features (Beniger, 1986; Zuboff, 1988).

An evolutionary perspective brings specific attention to the processes of change in government organizations related to the implementation and use of IT. Moreover, such a theoretical framework acknowledges the diversity of government organizations (Meyer, 1995) and interprets it as the result of the history of these organizations (Calori, Lubatkin, Very, & Veiga, 1997). Diversity is a sign of the evolving nature of organizations: government organizations, like any other organizations, are subject to processes of variation, selection, and retention and their evolution is path-dependent. An evolutionary perspective can be especially useful in order to provide an overall framework of change processes in government organizations.

The evolutionary perspective on bureaucracies is especially well-equipped to conceptualize how government organizations can morph into “new” bureaucratic forms characterized by fewer hierarchical levels, more lateral communications, more decentralized decision making processes, etc. These new bureaucratic forms have been variously labeled post-bureaucracy, soft bureaucracy, bureaucracy-lite, etc. (Courpasson, 2000; Hales, 2002; Kellog, Orlikowski, & Yates, 2006; Vaast, 2007). In this paper we simply refer to these changes as trends toward a “post-bureaucratic” environment while being aware that there is high variety in the changes experienced in government organizations. While some post-bureaucratic organizations have never been bureaucratic (e.g. newly created companies, small-sized private organizations), government organizations have most probably had to make the transition from bureaucratic to post-bureaucratic (Iedema, 2003). These transitions have not, however, been much investigated so far: our paper aims at addressing this gap in the literature.

Such transition is likely to be complex (McNulty & Ferlie, 2004). Part of the complexity of this transition has to do with the large size of government organizations: Changes in one part of a bureaucracy may not lead to similar changes throughout the bureaucracy, leading potentially to complications, side effects, power and political struggles, etc. (Aldrich & Ruef, 2006; Courpasson, 2000; Courpasson & Reed, 2004; Vaast, 2007). Another key specific dimension of change in government organizations that is likely to affect the process toward post-bureaucratic organizing is that, more so than other types of organizations, they are both institutions and organizations (Fountain, 2001). Therefore, it is particularly important to take into consideration institutional dimensions of technology-related changes in these contexts (Orlikowski & Barley, 2001). Institutional and evolutionary perspectives share common threads that have been put forward by Nelson and Winter (2002), as well as by North (1990). An evolutionary perspective of change in bureaucracies has to take into consideration institutions as factors of variation, selection and retention as well as institutions as subjects to change. Institutional renewal is often related to intense internal political struggles and trade-offs in bureaucratic organizations (e.g., Kim, Shin, Oh, & Jeong, 2007).

The notion of co-evolution is especially useful in order to take in consideration the institutional dimensions of evolution (DiMaggio & Powell, 1983; Kim et al., 2007). Moreover, recent research has emphasized the
importance of institutional dynamics for the adoption and use of technology (Markus, Steinfeld, & Wigand, 2006; Orlikowski & Barley, 2001; Wang & Swanson, 2007). Thus far, the implications of institutions as source of variation, selection, and retention have not been applied to change related to web-based IT projects in government organizations. Yet, one can expect that, because of their large size, organizational complexity, and history, institutional change in government organizations will have to emerge at different levels that inter-relate with one another: the individual level, the group level, the organization level, and even the societal level.

Figure 1 summarizes the evolutionary framework adopted in this research.

Figure 1 shows how an evolutionary perspective can help understand change in government organizations that is related to the implementation and use of web-based IT projects. An evolutionary perspective helps put forward the different sources of change in organizations, be they internal (e.g. managers or change agents) or pertaining to the external environment (e.g. technological innovation, institutional pressures from stakeholders or other comparable organizations). It also conceptualizes the process of change as path-dependent (i.e. related to the past history of the organization), leading to trends toward exploitation of existing practices. Change itself is conceptualized as involving the related stage of variation, selection, and retention, by which exploration happens, leading to change in routines, relationship with citizens, organizing, etc. Figure 1, though, summarizes an evolutionary perspective of change in organizations with no specifications regarding the change processes specifically experienced in government organizations. There is therefore a need to understand better the evolutionary processes that may unfold in government organizations as they implement web-based IT projects, to see if, and how, new “post-bureaucratic” traits emerge.

To do so, in what follows, we present evidence from four qualitative case studies in order to understand better the unfolding of the processes of variation, selection, and retention within government organizations that implement web-based IT projects and to examine more closely the dynamics and interdependencies between the different sources of change and its implications for government transformations.
Methods

We interpreted observations from four qualitative in-depth case studies of web-based IT projects in four government organizations, in order to pursue these questions. Our objective was not to test statistically some hypotheses derived from the evolutionary perspective but, rather, in keeping with a rich tradition of qualitative case studies in the IS field (see, for instance, Barrett & Walsham, 1999; Orlikowski, 2000), to illustrate the relevance of the proposed conceptual framework and refine it to the specific context of governmental organizations thanks to the similarities and differences among the case studies. We summarize below the context of these case studies and then present the data collection and analysis process.

Field settings: Four web-based IT projects in government organizations

Alpha
A web-based IT project developed within Alpha, a Swiss government organization, was launched in 2001, after the state government ordered the state chancellery to explore the situation of IT and to draft a proposal for a web portal. The state chancellor appointed a director for this task, who then organized a government-wide retreat, inviting representatives from all agencies as well as other interested parties with previous (strategic) IT experience to participate. The newly appointed director chose to cast this very wide net since he came from outside the administration and had only limited knowledge of the administration and its members. The main result from this retreat was a report to the state government with an IT strategy and action plan, recommending (1) the launch of a portal organized around ‘life events’ (e.g., going to school, getting married, setting up a business); (2) the integration of shared IT infrastructure into a platform; and (3) the incorporation of existing projects: a physical one-stop shop, an ongoing government reform project, data logistics (a project aiming at the standardization of data handling across different data bases), and the reengineering of business and document processes. The IT strategy recommended keeping a manager in charge of the initiative, but did not recommend creating a designated team or otherwise assigning any staff to this position. The initiative’s director therefore relied on the informal network of representatives from several agencies that had formed in occasion of the retreat to implement the plan. The portal was launched in 2003, in connection with the implementation of 26 partial projects.

Beta
Beta was a government organization also located in Switzerland. In 2000, the State Government appointed a cross-agency steering committee and hired a consulting firm to assess the potential of a web portal as part of ongoing government reforms. The IT strategy resulting from the consultant’s report envisioned the following objectives: (1) launch of a life events portal; (2) a centrally administered intranet as a backbone for electronic service delivery and internal knowledge management; (3) optimization of internal processes; and (4) the implementation of 16 partial projects. Over time, the core team in charge of the project moved into a newly constructed building several blocks away from the main seat of the State Government (its prior location). To guarantee continuity of communication following this physical separation, which several members complained about, the deputy director of the initiative organized monthly “e-luncheons” with representatives from all involved agencies to update them on progress made and discuss their questions and concerns. The portal was launched in mid-2003. Whereas the original plan had been for the core team to disband at the end of 2003, the State Government promoted the team to a permanent staff organizational unit with the mandate to coordinate and support IT applications in individual agencies.

Delta
Delta was a government organization located in the north-eastern United States. To initiate the web-based IT project, the then governor appointed a public-private task force to develop a strategic plan and implementation roadmap for a state-wide web portal. The report resulting from the joint work of the task force, a steering committee, and five policy work groups contained the following objectives: (1) the creation of an intentions-based portal (i.e. a portal that groups services by natural affiliation rather than by government agency); (2) a common IT infrastructure for ‘shared services’, such as electronic payments and a customer relationship management (CRM) program; and (3) the implementation of 27 partial projects.
The recommended organizational structure envisaged the creation of a web portal core team, which was formed that same year. It consisted of a director and six core team members: A portal manager, a webmaster, and four ‘channel managers’, each responsible for the relations with a specific group of stakeholders (citizens, government, business, visitors). After the initial planning phase, the steering committee became the portal’s advisory board. The portal was launched in 2002, and the implementation of shared services and partial projects was officially concluded in 2003. The core team was disbanded shortly thereafter, and one of the former channel managers became the portal director.

**Epsilon**

Epsilon was a government organization located in the north-western United States. Various web portal initiatives spontaneously emerged in different agencies before the state legislature appointed a board to explore and coordinate these initiatives. The board formulated an overall objective for a state-wide web portal, namely the coordination of (decentralized) applications, infrastructure, and policy. Together with an external consultant and partners in various agencies, the state IT department subsequently developed a roadmap for creating a technology infrastructure to support the Internet. The roadmap was the basis for the development of a strategic IT plan. A portal was launched in 2000, focusing on the following areas: (1) the organization around life events; (2) digital democracy; and (3) an orientation for supporting businesses in the state. A total of nine sub teams worked together on the development of online services, under a coordinator project affiliated with the IT department. The focus then turned to continue expanding IT applications to state agencies, the hub of it being an IT applications “Academy”, a live development environment where course participants from different agencies and organizations come together to learn how to build IT applications and how to accelerate the deployment of online services. In 2005, the Academy was incorporated into the newly created “Enterprise Initiatives Group” as part of a series of efforts to guarantee business continuity. Other parts of the original web portal initiative have been institutionalized, in the meantime, becoming separate projects (with separate project managers), and the members of the overall web portal project maintain informal relationships.

Table 1 summarizes key dimensions of the four case studies.

<table>
<thead>
<tr>
<th>Case</th>
<th>Location (project start)</th>
<th>Budget (employees)</th>
<th>Project objectives</th>
<th>Portal launch</th>
<th>Project initiation</th>
<th>Description of project group</th>
</tr>
</thead>
</table>
| **Alpha** | Switzerland (2001) | $3.83 billion (32,800) | Life events portal  
Integration of IT infrastructure  
Incorporation of existing projects | 2003 | State government appointed the state secretary to explore the status quo of web-based IT in the state and draft a project proposal | Project manager, many loosely connected project members  
Affiliation: State chancellery |
| **Beta** | Switzerland (2000) | $10.17 billion (141,300) | Life events portal  
Intranet Optimization of internal processes  
Implementation of partial projects | 2003 | State government hired consultant to assess the potential of web-based IT project as part of the ongoing government reform | Project manager, core team of four  
Affiliation: State chancellery |
Case | Location (project start) | Budget (employees) | Project objectives | Portal launch | Project initiation | Description of project group |
---|---|---|---|---|---|---|
Delta | US (2000) | $32.01 billion (327,000) | Intentions-based portal Common IT infrastructure Implementation of partial projects | 2002 | Governor appointed a public-private task force to develop a strategic plan and implementation roadmap | Project manager, core team of five Affiliation: State IT department |
Epsilon | US (1998) | $36.62 billion (305,500) | Coordination of existing initiatives, infrastructure, and policy | 1998 | Legislature appointed a board to explore and coordinate web-based IT initiatives, which resulted in a roadmap and a strategic plan | Various project managers, members of project group loosely connected Affiliation: State IT department |

Table 1: Key dimensions from the case studies

Data collection and analysis
One author of this paper was the field researcher for this research. She selected these four settings through a purpose-driven and progressive sampling (Miles & Huberman, 1984). Cases had to be relevant to the subject of the research (i.e. transformation of government organizations through IT projects) and had to be comparable to lead to meaningful cross-case analyses (Yin, 1994). In particular, selection criteria included (1) an experience done in a state-level government agency in a developed economy, and (2) a clearly identifiable web-based IT project. The field researcher also used a theoretical replication strategy (Yin, 1994) by (1) selecting cases in two different countries, Switzerland and the United States; and (2) by selecting cases in different stages of their project, in order to gain a better understanding of the processes themselves. More details about the field settings can be found in (Binz-Scharf, 2003). These two countries were selected because of convenience of access, but also because the United States and Switzerland share similarities in governmental context (two developed countries with federal government structures whose states are largely autonomous). In order to get a better sense of the change processes related to web-based IT projects, and their transformation over time, the field researcher chose a multiple case strategy. Multiple-case sampling adds confidence to findings, since looking at a range of similar and contrasting cases may enhance the understanding of a single-case finding. If a finding holds in a determined setting and, given its characteristics, holds in a comparable setting but not in a contrasting case, the finding is more robust (Miles and Huberman 1994).

For all four cases, the field researcher relied on interviews from key players in the change process (reputational selection strategy). Respondents included, in particular, for each project, project managers and team members of the IT implementation, sponsors of the new technology, as well as users or potential users of the system. She stopped adding new respondents when a relative saturation of case observation was obtained. All interviews were semi-directed, recorded and transcribed. The field researcher also went on site visits in the investigated organizations, in order to get a better sense of the work practices, the organization in place, the systems being used. These site visits were also the occasion for numerous informal and “off-the-record” encounters with people working in the government organizations and gave a better sense of the perception of the web-based IT projects as well as of the ongoing change processes in
these organizations. Finally, the field researcher had access to internal documentation regarding the projects and to the systems themselves. Table 2 summarizes the collected data.

<table>
<thead>
<tr>
<th>Data collection</th>
<th>Alpha</th>
<th>Beta</th>
<th>Delta</th>
<th>Epsilon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Switzerland</td>
<td>Switzerland</td>
<td>United States</td>
<td>United States</td>
</tr>
<tr>
<td>Interviews</td>
<td>6</td>
<td>5</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Site visits (days)</td>
<td>7</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Internal documentation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Access to web-based projects</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Post active data collection periodic updates</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Table 2: Summary of collected data

In order to analyze these data, the two authors first had to reduce them meaningfully so as to manage the original volume of the collected data (overall, more than 700 pages of single-space interview transcripts and field notes had been collected). The authors therefore started by relying on the data transcripts in order to build narratives of each case. Then, they compared the four cases with each other. They then contrasted their respective interpretations among themselves as well as with some respondents of the field settings and with academic peers. Once the case data had been recorded and the authors had a good idea of what happened, they started contrasting the case observations with the theoretical framework they were in the process of building. The data interpretation process took place in a highly recursive way, with the two authors going back and forth from the data and the existing theory, in order to expand both their understanding of the case observations as well as the initial evolutionary framework. This iterative process was akin to the Straussian version of grounded analysis (Pawlowski & Robey, 2004; Strauss & Corbin, 1998) in the sense that the authors did not enter the field or analyze the data without any knowledge of conceptualizations of IT projects in government. They had in mind a series of concepts and theories (e.g. change, evolution, exploration, exploitation, IS implementation) that could shape the observations they made of the field and the field notes. Their pre-existing theoretical framework, however, changed gradually as they analyzed the data and realized that the evolutionary perspective seemed especially well-suited to interpret the observations. Once they started building the evolutionary argument in governmental context, based on existing literature, their analysis also changed, as they strove to identify and analyze, across the four cases, evidence of path dependency, variation, selection, and retention. The building of the theoretical framework, cases analysis, and discussion was therefore highly recursive and continued until stabilization of the framework and the data analysis process. The authors finally strove to respect accepted standards of good qualitative and interpretive research in the IS field advocated by (Klein & Myers, 1999). In particular, the analytical process strove to establish a solid contextualization of the observations, in order to make sense of the observed change processes within the investigated organizations and their institutional contexts. At the same time, the analytical process went back and forth between the observations and the emerging conceptual framework in order to move from local observations to more abstract and general categories. The interpretive analytical process also applied continuous suspicion of the interpretations, looking for observations that would disconfirm expectations and searching for alternative explanations. For instance, some alternative explanations of the observed change processes had to do with country differences, which were acknowledged and taken in consideration as part of the contextualization of the cases that influenced each government organization’s evolutionary path.

Findings: Evolving government organizations and their web-based IT projects

This section presents some of the similarities and differences among the case studies that appeared revealing of the evolutionary processes experienced within these four government agencies as they
implemented web-based IT systems. We first put forward some general characteristics of the change process and then we investigate the inter-relationships between the sources of change at different stages of the evolutionary change process.

First, the projects experienced at Alpha, Beta, Delta, and Epsilon were all meta-projects (i.e. each one involved many other smaller projects) that required multi-level observations. This characteristic was symptomatic of the size and complex nature of the organizing of government organizations. Moreover, these multiple web-based IT projects required the transformation of this organizing to be successful. For instance, the resulting changes in the government organizations were usually new services to citizens. These services were for most organized around citizens’ needs (e.g. the “major life events’ portal”: for wedding, births, moves, etc.) rather than around existing departments of the organizational charts of these government organizations. The resulting changes involved using web-based systems in order to facilitate free, lateral flows of information from the government organizations to the citizens, but that also involved transforming the organizing and information flows within these government organizations as well.

These transformation processes did not come without difficulties. In particular, the four case studies revealed that, especially during the early stages of the change processes, the forces of retention in the government organizations were very strong. Respondents often referred to a “fear of failure” as a way to explain the tendency toward exploitation of the existing order and retention of past organizing in their agency. For instance, the communications director of Beta referred to this phenomenon in the following way:

“The fear [of government employees] of doing something in a way less than perfect primarily exists toward the outside world. Generally, the way it works in government is that when government makes a mistake, you can read about it in the papers the following day. This, in my view, is the predominant fear of government employees.”

This respondent mentioned the intense pressure experienced by employees from the government organizations who had to do everything “perfect” in order to be accountable with regard to the environment. This perception, which was shared by many respondents, went against the tendency toward “trials and errors” that usually comes with change processes. This quote illustrates the strength of the forces of retention experienced in government organizations, or of change that tended toward the exploitation of the already known rather than the exploration of the unknown. This situation made it especially difficult for change to emerge from the bottom-up given the pressure on people working in the government organization. Change that had not been mandated from the top and that did not result in obvious success could easily be interpreted as a failure or as culturally unfit vis-à-vis the rest of the organization. Finally, this quote also points to the pressures that can be felt by employees who are aware that their organization is also an institution, subject to increased scrutiny by the public and other institutions (see: “when government makes a mistake, you can read about it in the papers the following day”).

Therefore, the forces of changes that were mostly experienced especially at the beginning of the web-based IT projects were that of retention, exploitation, and path dependency. Path dependency, in particular, affected what people considered feasible or not in the project. A policy analyst from Delta explained, for instance:

“We see people wanting to create an online application that basically mimics the paper process […]. Take [for example] … environmental permits…. There may be paper signatures that are required right now, ink signatures, that are not mandated by any statute or regulation, it’s just that for the last hundred years we've done it this way, so they immediately think, ‘Oh my god, I need an electronic signature’. So we go back and ask, ‘Why do you think you need an electronic signature?’ ‘Because the paper is signed.’ ‘Well, where does it tell you that the paper has to be signed?’ And when they go back and they look at their regulations and statutes, they say, ‘You're right, there's nothing here that says that, so we don't need that, we need to authenticate where the paper's coming from, but we don't need a signature.”

This quote reveals the strength of tradition in government organizations as well as the perceived all-mightiness of the written rule. Formalization, a typical bureaucratic feature, was very often taken for granted by stakeholders of the IT projects, and formalization was often perceived as limiting the potential for change. This quote also refers to potential odds between trends towards exploitation and exploration, whereby the web-based IT projects could provide occasions for exploration that involved questioning the tradition and already established way of doing thing. In the previous quote, the formal signature was
originally seen as necessary outcome of formalization and legal accountability. After questioning the origin of the routine, though, people realized that the need for a signed form was only a product of the past history of the routine, a result of its path-dependency. The web-based IT projects involved questioning the history of the government organizations and sometimes going against these established traditions, which required that there were champions of change high enough in the hierarchy.

The case studies also revealed that the different sources of change were often deeply inter-related and that they affected the change processes. In particular, the transformations experienced in the government organizations were profoundly related to the combination of technological innovation (i.e. new IT made it possible to manage and circulate information in new ways and in an inexpensive way) and of institutional pressures (i.e. growing trends toward “modernizing” government and putting it up-to-speed with the “information highway” emerging at the beginning of the twenty-first century). At times, however, the case study revealed that the different factors of change did not coincide in their effect on the government organizations. In particular, we observed that web-based initiatives to share more information lacked sufficient support by management when they appeared at the same time as trends toward more efficient use of resources. When that occurred, spending oriented toward implementing IT projects often became seen as discretionary spending toward uncritical missions. For instance, a Delta participant explained how a project of web-based IT implementation that aimed at making information flows more fluid failed to receive resources:

“One of the things that my boss actually wanted to do is start building a knowledge management database, so that when people get phone calls, regardless of what agency does the phone call, there is a knowledge management database that they can refer to be able to better help point that customer in the right direction. That hasn't happened. Part of it was a funding issue also - those packages are very, very expensive - so we just didn't go there.”

This quote reveals that the IT project was not allocated sufficient resources even though it was thought to carry out the potential for better citizen information management, due to a perceived conflict between the price of the technology and the priorities of government. It was usually difficult for the people who were directly involved in these projects to convince their hierarchy that the implementation of web-based IT projects was a priority that fit with the espoused trend of rigor in spending. A web-master at Delta explained the difficulties of communicating bottom-up to suggest improvement in the systems and get additional funding:

“A lot of it is because we're working with people who have a job, they have a boss, their boss ultimately is the commissioner of their agency, whose concerns are their goals and objectives, mandates from the legislature or from the governor's office, and for the webmaster down here at the bottom of the pile to say, 'Hey, we should do this', just either never makes it to the top, or is just not a priority at the top.”

This quote suggests the difficulty to access resources to implement these projects in organizations that are as big, complex, and tightly regulated as government organizations. This quote also reveals a widely expressed contradiction between IT-related change initiatives and institutionalized priorities. In these conditions, bottom-up initiatives, in particular, had difficulty finding support. It usually took an administrator who had sufficient institutional power to influence other important stakeholders in the project to change the perceptions of these IT projects and to make them appear consistent with the espoused priority of limited spending and increased efficiency. Especially, these administrators had to convince higher-level hierarchy of the fit between the new technology and the priorities of government. In the words of one such successful administrator at Epsilon, IT projects could only be successfully carried out if “direction and commitment [was provided] from the very top levels of government” because “executive sponsorship brings priorities and it brings resources”. A Delta web-based IT project team member explained further:

“The problem that we find is that government is still organized the way government is organized, it's very hierarchical, so that if you don't get buy-in at the top level, where the agency heads are talking to each other and say, "yes, our teams are going to work together and are going to share this application", it's not going to happen. It's just not going to happen. [But] when you have the governor or you have the [secretary of a department] at a cabinet meeting talk about, "this secretary and this secretary need to work together to create this IT application", that's as important
as the worker bee level is, because that gives the legitimacy to those worker bee people to work with each other.”

This quote illustrates that government organizations were undergoing changes in their information management, inter-agency relations, and services to citizens, but that they also remained highly hierarchical, a key feature of “traditional” bureaucratic organizations. Ironically, change processes, which sometimes involved stimulating lateral versus vertical information flows and, hence, could jeopardize the formal hierarchy, could only be triggered if project managers were able to convince the hierarchy of the importance of the project.

On the other hand, though, variation and selection processes arose at a large scale when the availability of new technologies was combined with concurrent institutional pressures. A sense of urgency came with these pressures and usually fueled resources to expand local initiatives throughout the government organizations. For instance, at Alpha, there had been many local, bottom-up web-based initiatives but no successful coherent integration of these multiple initiatives, for lack of established priorities with regard to IT. However, when other governmental agencies (i.e. state agencies) started coming up with web-based portals integrating multiple online services, the upper management of Alpha revised its perception of web-based IT projects. Rather than being seen as secondary projects potentially leading to risky changes and mistakes, they became seen as necessary change for the government organization to “compete” with other government organizations and to “modernize” public services. The mimetic pressures of institutional isomorphism (DiMaggio & Powell, 1983) therefore led to transformations in the perceptions of the urgency and importance of these projects, as is exemplified by the project member of Alpha:

“I’ll tell you how we got started on our [overarching web-based IT] project. Well, the [state councilor] talked to his colleague from [another state] at a regional meeting, and he came back saying, ‘they are doing all this fantastic stuff, why can’t this be done in our state?’”

The case studies also revealed interdependencies in the internal and external forces of change. In particular, when the implementation of web-based IT projects had become part of the strategic priorities of the government organizations and when more resources where subsequently officially assigned to the projects, more people were usually asked to join the project teams. Among them were often new members of the government organizations who had just been hired from private sector for their experiences in comparable web-based IT projects in the private industry. The rationale for hiring these ‘outsiders’ was usually that they had acquired useful competences to achieve these projects quicker in the government organization. These new employees were hired for their expected abilities to act as “boundary spanners” (Levina & Vaast, 2005) and to incorporate some private sector logics and routines within the management of the web-based IT projects. These employees however faced difficult challenges of their own, as they had to learn fast the complexities of the government organizations and were being presented as symbols of change in the organization, or change agents, which sometimes led to tensions and resentment by other, tenured, employees. When these boundary spanners lacked constant support and buy-in from their managers, they experienced a turnover that was much higher than the traditionally low turnover in the government organization.

Discussion

The four case studies presented various contexts in which IT projects had been implemented or were in the process of being implemented. They dealt with some of the difficulties that were experienced by the project teams to find resources, implement the new systems, and communicate their importance for government organizations. They also reveal how new, web-based, technologies contributed to processes of transformation of government. In what follows, we bring together the conceptual framework and the evidence from the four case studies in order to deepen the observations and expand the evolutionary conceptualization of the transformation of government with web-based IT projects.

It should however first be noted that some similarities and differences between the US and Swiss case studies were observed. Many of the differences appeared to be anchored in the cultural context of the respective countries. For example, respondents from the Swiss cases often mentioned the crippling effect of regulation on their innovation efforts, whereas in the US the law was considered more of a variable than a constraint. Another difference regarded customer orientation. Although claimed to be the main objective of the projects in both countries, customer orientation was far more rooted in US American culture than in
Swiss culture. This resulted in citizens and businesses having higher expectations of government services in the US. In contrast, public officials in Switzerland often lacked the incentives for providing better customer service. Finally, leadership and management differed significantly between the countries. Contrary to the US, in the Swiss cases there was a clearer attachment to rules, in particular with regard to the observation of the chain of command, with little chances of grassroots ideas to make it to the top. This difference was partly due to the physical setup of government agencies. In Switzerland, many government agencies were located in historical buildings where co-workers were distributed in closed-space offices, whereas in the US office cubicles as dividers of a big open space prevailed, and partly due to the distant formality with which the Swiss treat each other in general (Binz-Scharf 2003).

Beyond these dissimilarities, though, the four case studies provided consistent insights regarding the processes of transformation of government with IT implementation, which gains to be interpreted from an evolutionary perspective. In particular, the case studies revealed how the prevalence of sources of retention (i.e. reproduction of the existing order) made it difficult for IT projects to be implemented and used in ways that contributed to the transformation of government. Moreover, the case studies also showed that for such transformations to occur there was a need for multiple sources of change to work together (e.g. technological innovation, institutional reforms, and new administrators).

Furthermore, the four case studies revealed that many actors who were involved in the web-based IT projects, especially in the implementation team, were aware of the characteristics of openness, interoperability, relative inexpensiveness, and user-friendliness of these new applications. These characteristics of web-based IT applications meant that, in government organizations, different departments and people than the ones who had so far been in charge of the traditional mainframe systems could take the lead on the new projects. These characteristics also meant that the networks of communications and information flows could be expanded and stimulate more lateral exchanges. However, the expected changes rarely came about as expected, without difficulties. Even though the affordances of the technology (Orlikowski & Iacono, 2001; Zammuto, Griffith, Majchrzak, Dougherty, & Faraj, 2007) made it possible for a new structure of project management to emerge and be sustained for the implementation and maintenance of web-based new IT, the overall structure of resource management usually remained unchanged, at least in the early stages of the implementation. As the distribution of financial, technical, and human resources needed to carry out these projects remained unchanged at first, it still followed the hierarchical and functional official structure, which sometimes dampened the transformation processes by making it difficult to sustain resources for the projects.

In a related way, the four case studies revealed that, for government organizations, differences in the rhythm of transformation of various sources of change and retention affected the transformation process in government. Moreover, the cases showed that, for transformation in the government organization to occur, there was a need for an emergent consistency of elements generating variation – elements bringing change in a consistent way as factor of variation. This consistency was not a priori given. Rather, specific actors who had interest in the change built it. These actors made the connection among the sources of change and influenced others’ perceptions of the projects. For instance, the web-project managers who needed resources to fund their projects would often use the argument that the new web-based system would modernize the bureaucracy and improve services to citizens. When this rhetoric convinced the high-level hierarchy, funded was warranted, and the web-based applications could be implemented a way that stimulated other changes in the organization and relationships with citizens, at different levels.

Overall, the four case studies exhibited transitions toward a more “post-bureaucratic” organizing, characterized in particular by increased lateral flows of information and reorganization of tasks around services to citizens. An evolutionary framework pays special attention to the transitions through which traditional bureaucratic organizations could take on new organizing features. This is useful because, in contrast with typical “post-bureaucratic” organizations that have never been bureaucratic in the Weberian sense of the term (e.g. Kellog et al., 2006), government usually has to undergo a difficult transition to become post-bureaucratic. An evolutionary perspective provides a useful conceptual lens to understand this transition. It is especially relevant to make sense of what changes and what does not change with the implementation of new technologies. The evolutionary perspective helps understand how government keeps some traditionally bureaucratic organizing features (e.g. hierarchy-based decision making and control) while adopting new features as well (e.g. lateral information flows). The evolutionary perspective interprets these distinct and complex transitions as related to processes of exploitation or exploration of multiple sources of change and of path dependency and path creation. The evolutionary perspective is
especially useful to conceptualize areas of changes and stability and to uncover which dimensions of organizing will most likely be affected by transformations as new technologies are implemented and used.

Concluding remarks

The transformation of government organizations with web-based IT projects is complex and this paper did not ambition to exhaust this complexity. Rather, this paper aimed at building upon and expanding the rich evolutionary perspective to the specific context of government organizations. We interpreted observations from our case studies from an evolutionary perspective but acknowledge that other, alternative interpretations could have shed a different light on the observed processes. In particular, the actor network perspective applied in Heeks and Stanforth (2007) could also have been used. We do not consider these two conceptual interpretations as mutually exclusive. Rather, they complement each other. While the actor network perspective provides useful insights onto the dynamics of power and persuasion involved in mobilizing different actors around an IT project, an evolutionary perspective takes a slightly wider view of the process of change by identifying the different stages in the change process and the various and interacting sources of this change.

Overall, this research provided several implications for research and for practice.

With regard to implications for theory, this research helped extend the evolutionary framework of change in organizations to the context of government organizations faced with IT implementation. The evolutionary framework appears especially relevant to understand how government organizations, which have traditionally been bureaucratic organizations, transform and adopt new routines of information flows, services to citizens, more informal coordination, etc., that make them more akin to “post-bureaucratic” organizations. Also, observations from the case study showed the importance, in order to understand organizational evolution, of taking into account not only objective sources of change (e.g. institutional changes, technological innovation, etc.), but also the perception of some factors as sources of change, and the importance of key players’ role in transforming other actors’ interpretations of the internal and external context. The construction of these environmental factors seems especially influential for the change process. It seems especially relevant to take in consideration the construction of these factors and the transformation of perceptions when considering changes brought about with the implementation and uses of new, web-based technologies. Indeed, given the fast pace of the transformation of these technologies and their constant innovation, it may be delicate for people working in government to recognize with no delay the potential of the new technologies. Hence, the actors who can shape, to a certain extent, others’ interpretation of the new technology and its potential role for government are especially influential in the transformation process.

The evolutionary perspective provided a theorization of change in government that focuses on how the change processes unfold. To do so, it examines how various sources of variation, selection, and retention interact and affect each other. In this regard the characteristics of the technology to be implemented are important, but they can only be considered in relation with other environmental factors of variation or retention. The evolutionary perspective suggests how some characteristics of technology become selected in the process of change as they interact with existing organizing features (e.g. prevalent hierarchy in decision-making) in order to generate specific affordances for the technology. In particular, in the context of a trend toward “post-bureaucratic” government, governmental organizations adopted the new technologies in ways that transcended vertical silos of information flows and that stimulated lateral organization of services to citizens, but that do not disrupt the prevalence of hierarchy in the centralized decision-making.

This research also offers implications for practice. In particular, its findings could be useful to administrators who are willing to implement new technologies within government. This research reveals that, in order to be effective in bringing up change, administrators should first have a good knowledge of the context of their organization, in order to identify potential sources of variation and retention. Then, administrators should work at convincing relevant stakeholders that the implementation of the new technology would fit new strategic directions for the government. Administrators who are able to convince stakeholders of the fit between their projects and the espoused priorities of government will more easily received resources for the implementation of the new technology and will be better able to legitimize their project and sustain it over time. One should be aware, though, that this constructed fit can also influence
future uses of the technology and therefore generate a path that will direct future uses and implications of
the new technology.
Finally, this research could be pursued in several ways. In particular, it should be noted that the web-based
applications investigated in this paper where part of the earlier generation of the web. Today, wiki
applications, social networking, blogs, and, more generally, the applications of the “web 2.0” are becoming
more and more widespread in an increasing array of organizational contexts (Davidson & Vaast,
Forthcoming; Herring, Scheidt, & Wright, 2005; Kumar, Novak, Raghavan, & Tomkins, 2004). We look
forward to future research updating our observations and investigating how these new applications may be
implemented in government organizations and may contribute to changes in practices and routines in new,
unexpected, ways.

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