

The Impact of an Integrated Financial System Implementation on Accounting Profiles in a Public Administration: An Ethnographic Approach

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Abstract

Purpose – This paper's aim is to study the impact of an Integrated Financial System implementation on Accountant profiles in a Swiss public administration. We observe the following variables: Accountants' skills, Accountants' functions, and Accountants' educational backgrounds. Each variable was studied before and after the implementation.

Design/methodology/approach – Our study is an empirical research based on a case study using interviews. We designed a questionnaire that we discussed with participants in order to determine how they perceive Accountants' job profiles.

Findings – Our main finding concerned Accountants' educational backgrounds. In the public administration that we studied, Accountants tended overall to lack the specialized knowledge necessary to work with the complex tools in an Integrated Financial System. We also confirmed other authors' findings, that the necessary skill sets change when an Integrated Financial System is implemented. Actually, we found that job descriptions did not change after the implementation as much as we expected they would.

Research limitations/implications – Our findings are based only on participants' perceptions, because documentation was difficult to obtain. Our small sample size also did not allow for generalizable results.

Practical implications – Public administrations must carefully determine the skills necessary for the accounting staff to work within an Integrated Financial System. Job descriptions must be adapted and prospective new hires should have higher qualifications as well as better accounting and ERP knowledge.

Originality/value – Our research was conducted using an ethnographic approach that compared and analysed perceptions from a diverse sample of government employees. Our sample population was chosen from among different departments and functions.

Keywords Accountant Profiles, Integrated Financial System, Public Administration, Ethnographic Approach

Paper type Case Study

1. Introduction

It is difficult to imagine how the financial and management accounting of large private or public companies would function without the finance modules of an ERP (Enterprise Resource Planning). These tools are software-integrated systems that are used to manage all (or an important part of) the resources of a company with only one database.

The main advantage of ERP systems is clearly the improved organization-wide information, which should enhance management decision-making and performance (see, e.g., Davenport, 1998, Scapens and Jazayeri, 2003, Kumar *et al.*, 2002, Equey *et al.*, 2006, Botta-Genoulaz and Millet, 2006, and El Sayed, 2006). However, ERP implementation results in numerous changes.

Many authors have pointed out the obvious organizational, cultural, and staff changes that can result from an ERP system implementation (see, e.g., Willcocks and Sykes, 2000, Kumar *et al.*, 2002, Granlund and Malmi, 2002, Rikhardsson and Kræmmergaard, 2006, and Sutton, 2006). Furthermore, these changes are also called dramatic changes (Scott, 2008) and need particular attention.

Sutton (2006) appealed to the international accounting research community to reinforce the existing body of research on the impact of ERP implementation on financial accounting and organizational environments. He noted the “radical changes” brought about, stating “Research tells us little, however, of how prepared managerial accountants are for this new environment” (pp. 3-4). The appeal extended to research on the “behavioural” aspects of enterprise systems. Moreover, many authors have found that there are significant differences between public and private sector contexts in the case of an ERP implementation and its use (Heintze and Bretschneider, 2000, Blick *et al.*, 2000, Raymond *et al.*, 2005). Kumar *et al.* (2002) noted that ERP systems were initially designed for the private sector. There has been very little research into implementing them in a government setting. Furthermore, the changes that occur within the finance functions of the public sector need to be investigated further.

The purpose of our paper is to examine the changes in accounting profiles (their skill sets, their functions, and their educational backgrounds) brought about by the implementation of an Integrated Financial System in a public administration. Our goal is to reveal the perceptions of the different staff members involved in the ERP project regarding such changes.

The remainder of the paper is organized as follows. Section 2 discusses previous research on ERP and financial and accounting function changes. Section 3 describes our research philosophy and approach. It also covers the design of our research process. Section 4 presents a Swiss public administration case study. Section 5 analyses our findings, and compares them with previous literature. Finally, section 6 suggests implications and extensions for future research.

2. Literature Review

2.1 Impact of new technologies on the “human” resources

Kumar *et al.* (2002) studied the perceived risks of an ERP implementation in ten Canadian government organizations. One of their important findings is also a major issue for our study. They found that “the roles and responsibilities of many employees changed and job definitions had to be rewritten” (p. 169) following an ERP implementation. Kræmmergaard *et al.* (2005), as cited by Arnold (2006), also argued that “Enterprise systems create a dynamic work environment in which employees must change the way they work and continually develop new competencies” (p. 10). However, these studies did not focus specifically on the finance and accounting functions. Thus, we need to explore such findings further.

Other changes for ERP users have been noted in the literature as well. For example, Rikhardsson and Kræmmergaard (2006) studied six large Danish firms and found that: 1) The time subsequent to going live was characterized by user insecurity, business “brush fires”,

frustration due to system set-up errors, and lengthy unfamiliarity with the new system, and 2) the actual challenge turned out not to be implementing the software and hardware, but changing employee behaviour and attitudes.

The “human” resources (the employees) are often cited as both a critical success factor and the source of the major problems encountered in ERP system implementation (Kumar *et al.*, 2002, Botta-Genoulaz and Millet, 2006, and Bérard, 2005). Kumar *et al.* (2002) has suggested that, in a government context, it may be particularly important to assess the employee policies and reward structures beforehand, in order to retain skilled workers.

2.2 Impact of new technologies on the finance and accounting professions

Burns and Vaivio (2001) stated that the major technological changes that have occurred in management accounting practices require a simultaneous change in management accounting. They cited two studies (IFAC, 2001, IMA, 1999) that found these professions have evolved from being primarily technical (bookkeeping), to increasingly managerial (project management, strategy). In other words, they have gone “from ‘controller’ or ‘score-keeper’ to ‘business support’ or ‘internal business consultant’” (Burns and Vaivio, 2001, p. 390).

Burns and Vaivio (2001) also noted the decrease in popularity of graduate accounting degrees in the U.S. They found that students are increasingly choosing non-accounting degrees, particularly general business degrees. This reinforces our conviction that new technologies are fundamentally changing the accounting profession.

Finally, Yazdifar and Tsamenyi (2005) surveyed a large number of U.K. Chartered Accountants. They found that “information technology” and “organizational restructuring” were cited as the two most important change drivers in management accounting practices between the 1990s and the 2000s.

However, much of the existant literature does not agree on the impact of ERP on the finance and accounting fields. Some authors have argued that its impact is limited (Granlund and Malmi, 2002, Scapens and Jazayeri, 2003). But we believe that, because ERP technology has evolved so rapidly, there is a real need for more research (Granlund and Malmi, 2002), particularly on the issues surrounding the “second-generation” of ERP systems (Kræmmergaard *et al.*, 2005).

Regarding the public sector, there has been little research to date on changes in the finance profession. But some authors have found important general differences between the public and private sectors. For example, Chang *et al.* (2000) described ERP implementation in the public sector, and illustrated that the issue of “ERP knowledge management” is most problematic in a government context.

Cacciagudi-Fahy *et al.* (2002) outlined the difficulties that public sector organizations may face in trying to initiate changes to work practices and conditions. They noted that such changes often require approval by union representatives. And Gullede and Sommer (2003) noted that the definitions of incentives and performance measures can differ between the public and private sectors. They stated, “There is nothing special about the management of public organizations that precludes them from implementing modern private sector management practices and integrated information systems” (p. 472). They also posited that the need for information is comparable between both sectors.

There appears to be a range of opinions and findings in the literature. But we believe that research on ERP implementation in the private sector most likely cannot be applied effectively to the public sector.

Wagner and Lederer (2004) found that the public sector has only limited experience with ERP implementation compared to the private sector. But, as Raymond *et al.* (2005) noted, the public sector has shown increased interest in ERP, which again highlights a need for further research, particularly on the specific conditions necessary for success. Indeed, Bajjaly (1999),

quoted in Rosacker and Olson (2008), argued that there is a risk to public agencies wishing to implement ERP systems because of the lack of sufficient research and case studies from this sector.

2.3 Impact of new technologies on accountants' job profiles

Granlund and Malmi (2002) argued that ERP implementation can result in changes in the scope of accountants' skills. To work within an ERP system, accountants must have a good understanding of business processes, and they must be able to work in teams and to communicate clearly and concisely.

The same idea is developed by Caglio (2003), who noted that, in today's world, "the traditional separation between functions has lost its meaning" (p. 142). Accountants are more tied to the entire business process, and need to understand such things as production operations and how to work with a production department's staff. Caglio (2003) also found that ERP implementation typically required more communication, more interaction, and "more complex and more intense spatio-temporal interdependencies of tasks and responsibilities" (p. 137). She noted the resultant increase in interdependency among teams, referred to as "interfunctional collaboration." Finally, she discussed the phenomenon of "hybridization," which she believed enlarges the role and the power of the accounting function, and may enhance its legitimacy. Interestingly, El Sayed (2006) has found that some accountants have begun to promote themselves as "experts" at maximizing the benefits of these types of systems.

Scapens and Jazayeri's (2003) case study found that management roles also became more complex as teamwork, communication, and cooperation increased. The role of an Accounting Manager transformed into something akin to an "internal consultant" or an "analyst". Caglio (2003) also described Accounting Managers as "business consultants" and "custodians" of the whole organization, including its information and its resources.

It is important to note that, typically, it is the CFO who leads the ERP's implementation (Caglio, 2003, Equey *et al.*, 2006). Also new skills are required from a CFO for this task: they need to become team leaders, to have superior communication skills, and to exhibit a thorough knowledge of all the processes of the company. Koehn (2005) asserted that the leader of an ERP implementation must have business and technical expertise as well as project management ability, and that "most governments do not have someone on staff who possesses all of these qualities" (p. 2).

Many authors pointed out that accountant in public administrations tend to have a lack of practical knowledge about ERP. Timbrell (2008) studied knowledge management of SAP implementation projects in the Queensland (Australia) government, and found there was significant doubt that users had the ability to run, maintain, or configure such systems properly. There are several hypotheses about this lack of knowledge: inadequate training, lack of curiosity on the part of users (for exploring the system), as well as overreliance on the implementation partner.

Timbrell's (2008) study also described the second major category of difficulties, that the "knowledge required to support and run SAP was not managed effectively" (p. 226). The study further noted that the ineffectiveness of knowledge retention strategies had far-reaching consequences. The skills gained by working on an ERP implementation project are highly valued in the job market, and employees with SAP experience could sometimes double their salaries by job-hopping.

Kumar *et al.* (2002) asked Canadian government officials to rank the major obstacles they faced during ERP implementation. 40% cited the availability and retention of skilled project managers, while 30% cited significant staff resistance and the knowledge gap between implementers and users.

Chang *et al.* (2000) confirmed that knowledge management encompasses problems from a difficulty retaining people after they have developed SAP skills to insufficient resources (and effort) put into developing in-house knowledge. Professional studies have echoed these concerns. Deloitte Research (2002) found that “governments have struggled to attract and retain the right employees against the lure of private sector salaries” (p. 5).

This key issue highlights the differences between the private and public sectors. In our opinion, it is at the core of the problem government organizations often encounter when implementing ERP systems. Our study aims to determine whether such an implementation in a public administration impacts accountants’ job profiles.

Table I. Summary of the impact of new technologies

Impact on human resources	<ul style="list-style-type: none"> • Change in roles • Change in responsibilities • Job definitions need to be rewritten 	Kumar <i>et al.</i> (2002)
	<ul style="list-style-type: none"> • Change in the way work is done • Development of new skills 	Kræmmergaard <i>et al.</i> (2005) Arnold (2006)
	<ul style="list-style-type: none"> • Employee insecurity • Necessary change in employee behaviour and attitudes 	Rikhardsson and Kræmmergaard (2006)
Impact on finance and accounting professions	<ul style="list-style-type: none"> • Change in accounting management practices 	Burns and Vaivio (2001)
	<ul style="list-style-type: none"> • Transformation of accounting professions from largely technical to more managerial 	IFAC (2001) IMA (1999)
	<ul style="list-style-type: none"> • Information technology as a change driver 	Scapens and Jazayeri (2003) Burns and Vaivio (2001) Rikhardsson and Kræmmergaard (2006) Yazdifar and Tsamenyi (2005)
Impact on accountant job descriptions	<ul style="list-style-type: none"> • Change in accountants’ skill sets • New skills are necessary, e.g., thorough understanding of accounting and business processes, ability to work in teams and act as team leaders, and better and more effective communication 	Granlund and Malmi (2002) Caglio (2003) Scapens and Jazayeri (2003)
	<ul style="list-style-type: none"> • More power, along with more complex tasks 	Caglio (2003) El Sayed (2006) Scapens and Jazayeri (2003)
	<ul style="list-style-type: none"> • Lack of general ERP knowledge and a lack of project management knowledge (in government context) 	Timbrell (2008) Kumar <i>et al.</i> (2002)

3. Research methodology

3.1 Foundation, criticisms and selection of research methods

Several authors have noted the usefulness and importance of case studies in ERP implementation (Newmann and Sabherwal, 1996, Holland *et al.*, 1999, and Carroll and Swatman, 2000). Caglio (2003) posited that using an in-depth case study is necessary because surveys are too widespread, and may not provide a complete picture of such a complex phenomenon.

Arnold (2006), on the other hand, argued that research methodology around ERP systems is based too heavily on case studies (qualitative research), and leads to a lack of generalizability. He advocated that other methods be used as well (surveys, quantitative research, triangulation ...). Patton (2002) also recommended triangulation, i.e. the use of different methods.

Our paper is an exploratory research article, and presents the results of a case study realized through interviews. We aim to obtain more detailed information, as recommended by Caglio (2003). This is the first step in a wider national survey. The information obtained will be tested in a second phase in order to ensure generalizability.

We also adapted “ethnomethodological” approaches, as suggested by Asa Berger (2000), who argues that “What ethnomethodology provides us (...) is a way of studying codes and unconscious belief systems” (p. 150). Asa Berger (2000) defined the tasks of ethnomethodological research as follows: 1) “To define the common sense of everyday life”. 2) “To show the relevance of everyday activities to sociological theory”. 3) “To rediscover the significance of the commonsense world of people” (p. 147). The originality of his approach is to use ethnomethodology in communication and media analysis. We intended to apply it to a group of professionals (accountants) in order to study the changes within their profession or more precisely to identify trends to study. To apply this methodology, we decided, during the interviews, to pose the same questions to people from different departments and with different functions. Our goal was to compare the perceptions, feelings and opinions of the different “ethnic” groups interviewed about changes in the accounting and finance functions (see description of “ethnic” groups in section 3.2). We argue that this research process is particularly suitable for revealing common or diverse perceptions.

Asa Berger (2000) mentioned two limits of ethnomethodology. He asserted that: 1) this method is “the most troublesome kinds of research there is.” (p. 145) because of the difficulty to define clearly what ethnomethodology is. Furthermore 2) the findings may not be significant because they deal with common sense of everyday life. For our purpose, we believe that an “ethnomethodological” approach is appropriate to reveal trends to be studied, but clearly not to highlight definitive and reliable results.

Burns and Scapens (2000) noted that the change process in management accounting is complex. They exhort researchers to use “holistic” or “longitudinal” research methods in order to capture the multi-dimensional character of this context. We believe using an ethnographic approach is efficient. Nonetheless, an ethnographic approach does not focus on “the whole” (i.e. the community) per se, but only on the perceptions of the different “parts” (i.e. the ethnic groups). It, therefore, differs from a holistic approach which is more focused on “the whole”.

To study the complex phenomenon which is the change in a profession, we applied a qualitative research method as recommended by Patton (2002). A qualitative approach is appropriate for “questions about people’s experiences” (Patton, 2002, p. 33) and “is particularly oriented toward exploration, discovery, and inductive logic” (p. 55). The kind of qualitative data obtained in our research are responses to very open-ended questions through interviews. One of the difficulties with open-ended questionnaires is to organize and analyze the voluminous data which is often quite heterogeneous because respondents are not guided into their answers. To deal with this difficulty, we decided to adopt one of Patton’s theoretical frameworks to analyze the data and we used a “cross-case” (p. 57) strategy. The analysis was done by “putting together coherent answers to major descriptive questions” (p. 438) in order to give an idea of the complete picture. “Simplifying and making sense out of that complexity constitutes the challenge of content analysis” (p. 463). Patton (2002) suggested nine options for organizing the data: “Chronology and history”, “Flashback”, “People”, “Critical incidents”, “Various settings”, “Processes”, “Issues”, “Questions”, “Sensitizing concepts” depending on the situation and the aim of the analysis (p. 439). We selected the following two: “People” and “Issues” (p. 439). “People” was chosen because they represented the “ethnic” groups which are the main focus of our analysis and “Issues” because they explained the changes we intended to point out in our study. Therefore, our analysis consisted in “grouping together answers from different people” (p. 440) in several matrixes. We grouped together answers from different “ethnic” groups (“People”), by kind of variables studied (“Issues”) and we compared three different situations: the data before the ERP’s project, after the ERP’s project and the ideal profile (“Issues”). This methodology allowed us to build the

matrixes presented in tables II to VII. Finally, we proposed an “interpretation” (p. 480) of the classified data, especially where enhancement of accountants’ job profiles could be done. By doing so, we intend to understand better the changes and to bring to light the main items to be tested in a quantitative study. As mentioned above, one limitation of very open-ended questions is that some respondents have given no answer to some “Issues” (see tables II-VII) and therefore the comparison and the analysis is not comprehensive.

3.2 Research question

As we noted earlier, the purpose of our case study is to analyse the changes in accounting and finance professionals’ profiles in a public administration context when implementing an Integrated Financial System. Therefore, our research question is “Does the implementation of an Integrated Financial System change the accounting profiles in a public administration?”

To answer this question, we examined the following variables before and after the ERP implementation:

- Accountants’ skills
- Accountants’ educational backgrounds
- Accountants’ functions.

Accountants’ skills are defined as accounting and finance knowledge, business process knowledge, ERP knowledge, professional experience and soft skills such as communication or leadership. The educational backgrounds variable looks at the kind of studies undertaken by the respondents and the diploma obtained. We are above all interested by their vocational education. Finally, the accountants’ functions are defined as the kind of job, tasks performed and the hierarchical level of accounting and finance staff.

In our case study, respondents were asked to describe these variables before (2002) and after (2009) an ERP implementation to determine their true perceptions of the situation and the level of change. In the case of any variation, we also asked if the respondents believed the changes were attributable to the new system.

3.3 Questionnaire and interviews

We designed our questionnaire (cf. specimen interview transcript in appendix) with four main parts: 1) general respondent information (e.g., name, position, department ...), 2) description of changes in accountants’ roles, profiles, and job duties, 3) description of changes in the organizational structure, and 4) evaluation of the ERP system and implementation project. We present only Parts (1) and (2) here, as our primary focus is on information obtained about accountant profiles. The questionnaire was validated by a workplace psychologist. She mostly verified that the questions were appropriate to test the variables selected and that no relevant subject was neglected.

All respondent interviews were semi-structured. We followed the structure of the questionnaire described in the above paragraph but the questions were very open. We wished to obtain information and emergent or unexpected comments from the interviewees. We mainly let them express their perception of accountants’ job profiles before and after the ERP implementation. We asked as few questions as possible, the aim was to leave respondents free to talk in order to capture what they considered to be the most important issues for them, even if certain elements are missing in their answers (as already explained in section 3.1). We conducted sixteen interviews between June and October 2009. During the interviews, we transcribed the respondents’ answers on the interview transcript template and in the week following each interview, we sent the typed transcript to each participant for validation.

The planning for the interviews went very smoothly; all the respondents contacted were available and agreeable to participation. During each interview, we requested such information as job descriptions, organizational charts, meeting minutes, policy documents,

internal presentations, names of key users, Project Leaders, and IT managers, and documentation of education. The documentation, however, was very difficult to obtain, thus we decided not to include it in our analysis.

3.4 The population

Our sample population was chosen from three departments out of seven. The aim was to conduct interviews to identify differences between departments which are also considered as different “ethnic” groups. We selected the departments with the largest role in the ERP implementation: 1) The Department of Finance, which was in charge of the project, 2) the Department of Education, which is one of the larger government departments and was very influential regarding the decision to implement the system, and 3) the Department of Construction and Information Technologies, which was in charge of the IT infrastructure deployment and maintenance for the project.

In each department, we identified key participants from six different levels of hierarchy. We refer to them as different “ethnic” groups: 1) the ERP Project Leader, 2) the Finance Managers, 3) the ERP end users (e.g., the bookkeepers and/or accountants), 4) the Human Resource Managers, 5) the IT Managers, and 6) an external consultant. In the departments mentioned above, we first selected six Finance Managers for interviews and, for each agency under review; we met one Finance Manager of the centralized finance service and one Finance Manager of a “Bureau” or Office. The choice of the person to contact was made with the help of the Project Leader and we favored key people or very involved staff. Then, we also met two HR Managers, also recommended by the Project Leader, as they were in the same function before the implementation of the ERP (i.e. before 2002). Based on the advice of the Finance Managers, we finally met three IT Managers and three ERP end users (one in each department). Obviously, we also interviewed the Project Leader of the Finance Department which had successfully piloted the ERP project and the operational chief of the external consultant. Thus, a total of sixteen interviews were carried out. Except for the Project Leader and, evidently, the external consultant, all respondents were employed by the agency under review during the time our enquiry in 2009 and the interviews were done seven years after the beginning of the ERP implementation. However, not all respondents worked for the concerned public administration before the implementation of the Integrated Financial System.

During an ERP system implementation project, many actors are involved. In the case of finance module implementations, the most important ethnic group engaged is evidently the finance and accounting staff. For that matter, major job changes (due to the use of standardized processes required by the new ERP system) will essentially concern finance and accounting staff, which are the population under review in this paper. However, other actors are also deeply involved in this kind of project. Another important ethnic group, involved is inevitably IT staff, IT managers in our sample. The third major ethnic group considered is external consultants. A final key group considered, although involved to a lesser extent than the aforementioned, is HR managers. All these actors are part of the community: the public administration.

The roles, the work (i.e. tasks performed) and the decision level of each ethnic group are significantly different within the project. Accounting and finance employees must mainly describe their current and future job and the necessary outputs (i.e. financial statements, reporting requirements, indicators). The aim is to configure the new system properly. As far as the IT people involved in the project are concerned, their main role is to make the necessary IT resources available to the staff concerned. Furthermore, they must resolve any technical problems and design the necessary interfaces. External consultants mainly bring their knowledge of the ERP system, their project management experience but also their

knowledge of business (albeit to a lesser extent than accounting and finance employees) to this diverse team. The role of HR managers during and after the ERP implementation project is to adjust the necessary staff to the new context and, if needed, to hire new competencies. In our point of view, the opinions expressed by all ethnic groups are significant and may differ. Each of the actors is committed to the success of the project and we, therefore, intended to study the perceptions of each actor in order to construct a better overall vision of the changes brought about by the ERP system to accountant profiles. Consequently, the choice of a wide selection of respondents to follow this ethnographic approach was to determine whether and to what extent the perceptions of each “ethnic” group differ. We need to better understand changes as postulated by Saunders et al. (2007): “its [ethnographic approach] purpose is to describe and explain the social world that the research subjects inhabit in the way in which they would describe and explain it. It is a very appropriate strategy in business, if the researcher wishes to gain insight about a particular context and better understand and interpret it from the perspectives of those involved”.

4. Case Study

4.1 Governmental organization

The organization under study is a Swiss Cantonal Government which is divided into seven government agencies and led by two main assemblies: The “Conseil d’État” (the State Council), and the “Grand Conseil” (the Main Council). These assemblies are audited by the “Cour des Comptes” (the Committee of Auditors), and supported by the “Chancellerie d’État” (the State Chancellery). The legal authority is represented by the “Pouvoir Judiciaire” (Judiciary Power), which is a separate entity. The organizational chart in Figure I illustrates the high level structure of the administration. The departments in gray were selected for interviews.

Figure I. General organization of the government – 2008

Insert here Figure I

Source: Adapted from

http://www.vd.ch/fileadmin/user_upload/organisation/autorites/fichiers_pdf/organigramme-2008.pdf

4.2 Description of the ERP project

At the beginning of this decade, the government’s information system (IS) was comprised of multiple applications and software created by individual agencies for their own needs. Most had been implemented without consideration of any global administrative vision.

The government intended to implement a unique and integrated financial and accounting system for all departments and agencies, called “Comptabilité Financière Intégrée” (CFI) (Integrated Financial Accounting). It was a substantial and forward-looking project that aimed to enhance the financial and accounting management of the government, while imparting a global vision of the organization to the Deputies and the Cabinet Ministers. The primary request was for greater understanding and clarity for decision-makers.

But the government also hoped to increase the effectiveness and efficiency of its operations, by, e.g., eliminating duplicate entries, aligning the rules and procedures among agencies better, improving their ability to meet deadlines, and achieving superior cash and treasury management.

The final goal was to obtain more transparency and reliability of financial reporting. Accounting information needed to be more structured at each stage of data processing, and reporting needed to be obtained more quickly. The ERP implementation was particularly useful in improving the organization of the finance and accounting activities.

4.3 The CFI project team

The DGFE (the Directorate General for Economic and Financial Affairs) of the Finance Department had the primary responsibility for project management. The CTI (Centre of IT of the State) was responsible for the technical part of the project, and was also an important player. Altogether, between 30 and 130 people (both internal and external) were involved in the project at any given time, and up to 55 external consultants worked during the busiest periods. The total amount of man-days estimated for this project was roughly 39,000, which illustrates its enormous size. Currently, the CFI counted more than 2,000 users.

4.4 The scope of the project

The following modules were scheduled for a March 2000 implementation: General Ledger, Accounts Receivable, Accounts Payable (with engagements), Purchase Orders, Inventory, Fixed Assets, Budget and Financial Planning/Forecasting, Administrative Processes, Cash Management and Forecasting, Counter/Box Office, Document Management/Filing, and Business Intelligence. Interfaces for payroll, human resources, and business systems were also designed.

After the initial scope was achieved, important functionalities were added, such as: project management, expense report management, school furniture management, simulation of salaries, and decentralized cash account management. Since April 2009, all the above modules and functionalities run in all departments. The level of implementation (i.e. functional coverage) is high, however the ERP installed is a “best of breed” system because the HR module and the “business solutions” are interfaced with Oracle Financials.

The need for a new Information System was also due to the huge amount of information that needed to be managed. The government’s accounting system supports approximately 300,000 accounts, and approximately 2.5 million accounting entries and 200,000 invoices (accounts payable) each year.

5. Findings

As we mentioned earlier, the goal of our respondent interviews was to obtain information about accountants’ skills, functions, and educational backgrounds. We discussed the situation before and after the CFI (Integrated Financial Accounting system) implementation, and we reviewed the full picture of accounting and finance profiles.

Tables II-VII provide summaries of participant answers about accountant profiles. We classify them by respondent functions (in this case, “ethnic” groups) and we transcribed the interviewees own words (which could explain differences of wording for similar issues).

Table II. Summary of accounting staff’s skill sets, classified by ethnic group - **Accountants’ perceptions**

	Before CFI	After CFI	Ideal profile
Skills	No answer	No answer	<ul style="list-style-type: none"> • Ability to change • Good team spirit • Computer or IT skills • More business process knowledge • Ability to multi-task • Analysis skills
Functions	<ul style="list-style-type: none"> • Accountant • Bookkeeper • Administrative Assistant 	<ul style="list-style-type: none"> • No change • No change in job description since 1974 	<ul style="list-style-type: none"> • No change • Add an ERP specialist for coaching
Educational backgrounds	<ul style="list-style-type: none"> • No formal vocational education • On-the-job training • Three years of vocational education • Business education 	<ul style="list-style-type: none"> • No change 	<ul style="list-style-type: none"> • No education necessary • Specific training to better understand ERP processes • In-depth CFI training

Source: Participant interviews

Table III. Summary of accounting staff’s skill sets, classified by ethnic group - **Accounting Managers’ perceptions**

	Before CFI	After CFI	Ideal profile
Skills	No answer	<ul style="list-style-type: none"> • Users lack accounting skills • Government lacks staff with ERP skills 	<ul style="list-style-type: none"> • Bookkeepers and accountants need to better understand business processes • Analysis skills • Computer or IT skills
Functions	<ul style="list-style-type: none"> • Secretaries (with accounting tasks) • Bookkeepers or Accounting Clerks • Accountants • Accounting Managers • Assistant Directors • Financial Officers • Management Accountants • Cashiers 	<ul style="list-style-type: none"> • Same as “before CFI” in services and offices • No more Bookkeepers or accountants as Department Heads • Add an Internal Controller to the top management within each Department • No change 	<ul style="list-style-type: none"> • No new functions are necessary • No change
Educational backgrounds	<ul style="list-style-type: none"> • Three years of vocational education • Accounting education • Bachelor’s or Master’s degree 	<ul style="list-style-type: none"> • Only Bachelor’s or Master’s degrees as Department head • Only one Chartered Accountant in the DGFE (the Department of Finance head) 	<ul style="list-style-type: none"> • Training for Accountants • More specialized business and accounting education • More “high-level” education

		<ul style="list-style-type: none"> • Three Chartered Accountants in the DCTI • No change 	
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Source: Participant interviews

Table IV. Summary of accounting staff's skill sets, classified by ethnic group - **Project Leader's perceptions**

	Before CFI	After CFI	Ideal profile
Skills	No answer	<ul style="list-style-type: none"> • Users lack accounting skills 	<ul style="list-style-type: none"> • Specialized knowledge of financial statements • Specialized knowledge of accounting standards (IPSAS)
Functions	No answer	No answer	<ul style="list-style-type: none"> • Data Entry Operator • Accounting Manager • Budget responsibility • Internal Controller • Cost Management Manager • Financial Analyst
Educational backgrounds	No answer	No answer	No answer

Source: Participant interviews

Table V. Summary of accounting staff's skill sets, classified by ethnic group - **HR Managers' perceptions**

	Before CFI	After CFI	Ideal profile
Skills	No answer	<ul style="list-style-type: none"> • Adaptation of skills • ERP knowledge • Knowledge of internal controls 	<ul style="list-style-type: none"> • Good knowledge of organization and information flows • Good knowledge of business processes
Functions	<ul style="list-style-type: none"> • Accountant 	<ul style="list-style-type: none"> • New functions of coaching 	No answer
Educational backgrounds	<ul style="list-style-type: none"> • Bachelor's degree in business and administration 	No answer	No answer

Source: Participant interviews.

Table VI. Summary of accounting staff's skill sets, classified by ethnic group - **IT Managers' perceptions**

	Before CFI	After CFI	Ideal profile
Skills	No answer	No answer	<ul style="list-style-type: none"> • Global view of the entire process • Large variety of skill sets
Functions	<ul style="list-style-type: none"> • Accountant • Head of finance service • Secretary (with accounting tasks) • Responsibility for finance 	<ul style="list-style-type: none"> • Creation of a group of financial and Information System experts • No changes 	No answer

	<ul style="list-style-type: none"> control • Administrative Assistant • Controller • Financial expert • Technical expert 		
Educational backgrounds	No answer	<ul style="list-style-type: none"> • One dedicated Information System expert • One Chartered Accountant • Lack of CFI training 	<ul style="list-style-type: none"> • Potential hires need a higher level of education • More global CFI training • More specialized CFI module training

Source: Participant interviews

Table VII. Summary of accounting staff's skill sets, classified by ethnic group - Consultant's perceptions

	Before CFI	After CFI	Ideal profile
Skills	<ul style="list-style-type: none"> • Good knowledge of how the Departments works • No global vision for State business and strategy 	<ul style="list-style-type: none"> • Enhancement of skills (Information System and management accounting skills) 	<ul style="list-style-type: none"> • Business knowledge • Background in ERP systems • Good global view of business and strategy
Functions	<ul style="list-style-type: none"> • Bookkeepers • Accountants • ERP Project Heads 	<ul style="list-style-type: none"> • Add key users 	No answer
Educational backgrounds	<ul style="list-style-type: none"> • No or little educational background • On-the-job training 	<ul style="list-style-type: none"> • Potential hires need a higher level of education 	<ul style="list-style-type: none"> • Training with tests and exams • Training follow-up

Source: Participant interviews

Note that answers about **ideal Profile-skills** are consistent among ethnic groups. All groups agreed about the importance of increasing the necessary skills for accounting staff working with an Integrated Financial System. The Project Leader specifically requested more specialized knowledge about international financial reporting and accounting standards, which seems to be lacking in the public administration. Many answers also suggested the importance of accountants having a better comprehension of the global business process. This finding is in line with the literature (Granlund and Malmi, 2002, Caglio, 2003) and represents a major change issue for the organization of the accounting function. Currently the government entity under review is working to describe its main business processes. This formalization (and professionalization) of the work performed is clearly linked to the use of an ERP system.

On the other hand, the answers from bookkeepers and accountants highlighted their feelings that their managers do not pay enough attention to their problems and requests.

I have the feeling that problems that we mention are not taken into account by management. For instance, concerning the project of Electronic Document Management implementation. (An accountant, personal communication, September 16, 2009).

We therefore deduce that Bookkeepers are somewhat uneasy with the ERP implementation. As mentioned in our literature review, the employee issues can be the most complicated part of an ERP implementation. It is important for the success of the project that staff concerns are handled with care.

The main finding regarding the **functions** is that they do not appear to have changed seven years after the CFI implementation. One respondent even mentioned that accountants' job descriptions had not changed since a long time.

The job description of all accounting functions in my service has not changed since 1974. It is therefore very difficult to match the current needs and tasks with this old job description. (An accountant in charge of accounts payable, personal communication, September 30, 2009).

Furthermore, there is a large variety of functions and vocational backgrounds among services and departments. There is no uniform policy guiding accounting functions for all departments. However, in those we studied, we did find the following general descriptions: 1) Bookkeepers, or Secretaries with no specific accounting skills (e.g., no vocational education), 2) Accountants with three years of vocational education (but sometimes accountants had no vocational education), and 3) Financial Officers (Accounting Managers), with Bachelor's or Master's degrees in Business Administration. The different ethnic groups surprisingly identified different functions. This issue is certainly due to differences in the functioning between the departments. Respondents from different departments have mentioned that there is very little functional or organisational alignment across the seven departments. For example, the Finance department sought to centralize the management of accounts payable. In their point of view, accounting and finance staff in services must only be in charge of controlling and analysis. The corollary is that the number of staff in certain functions (such as Accounts receivable) should be reduced.

The ERP Project Leader noted that these changes were not effective and were very difficult to achieve.

The necessary changes were not made in the other departments as the Finance department has no hierarchical power on them. (The ERP Project Leader, personal communication, June 22, 2009).

After the CFI implementation, Internal Controllers were hired. But this was due to changes in accounting and auditing laws, not because of the introduction of the ERP system. More financial and technical specialists were desired (e.g., the Project Leader specifically requested Cost Managers and Financial Analysts).

Previous literature has argued that job definitions must change after an ERP system implementation (Kumar *et al.*, 2002, Arnold, 2006). We found that skill sets tended to change (which is consistent with the literature), but job descriptions and functions did not. It is somewhat surprising to see changes in the accounting profiles, but not in the accounting and finance functions. As Burns and Scapens (2000) noted, however, "stability and change can be simultaneously part of the same process" (p. 22).

The main result from our interview process was the importance of **educational backgrounds**. We found that many bookkeepers and accountants had not studied accounting, and had very little (or no) vocational education. Indeed, we interviewed one Accounting Manager who was unaware that one of his bookkeepers had no formal education (neither general nor vocational). Despite numerous and complex new projects that use ever more complex financial tools, we found no Chartered Accountants among the Accounting Managers interviewed. The Finance and Administration Director of the DCTI had three Chartered Accountants in his service (out of thirty employees). It is important to note that the DCTI is responsible for the accounting of all government investments, and plays a major role in preparing the State's financial statements. We found that only one respondent from the DGFE (the Directorate General for Economic and Financial Affairs) had an employee who was a Chartered Accountant. Thus, it appears that very specialized accounting employees, such as Chartered Accountants or experts in Financial Integrated Systems, are scarce.

The lack of ERP knowledge among accountants has already been noted by authors (e.g., Timbrell, 2008), but the lack of general finance and accounting knowledge had not been discussed to date. This is an important finding of our study, which highlights that accounting and finance functions are being neglected in the public administration we studied (especially prior to the CFI implementation). We have pointed out that, despite the ERP implementation being considered a success, this success was limited by the lack of accounting knowledge of users as described by a responsible in the Finance department:

Because of a lack of skills the system is not used to the extent that it could be. (A Corporate Secretary, personal communication, July 26, 2009).

Some respondents discussed differences between the public and private sectors. They noted that accountants and Accounting Managers in the private sector tend to have better educational backgrounds and more experience with ERP projects. They also found that training during the implementation project was more strict and more rigorous (with tests and exams) in the private sector. This finding is also confirmed in the literature (see, e.g., Chang *et al.*, 2000).

The literature unequivocally confirms that ERP systems are a “change driver” (Scapens and Jazayeri, 2003, Burns and Vaivio, 2001). Although, one could argue that it is not the technology that should dictate the way to work. The implications of ERP go far beyond the technology itself. For instance, accounting entries are initiated in production or logistics modules and therefore, are no longer made by accounting people. But overall, ERP systems are built on standardized processes or on best business practices (Davenport, 1998) and, therefore, use work processes arising from modern and private enterprises.

In our case study, the change in work processes implies new knowledge and the government’s job openings now require higher qualifications. During 2009, the agency under review began establishing its financial statements under International Public Services Standards (IPSAS). For this purpose, a group of three Chartered Accountants were hired; furthermore, during our interviews all Accounting Managers mentioned their will to upgrade the accountant profiles for new hires. This is clearly due to the new ERP system being used, but also because of other projects and needs. Our interview results clearly pointed out that the CFI system, which uses international accounting and reporting standards, needs more professionalization and standardization of accounting functions. The CFI may not have directly caused this change, but it is a “change driver”, as previous literature has also noted (Scapens and Jazayeri, 2003, Burns and Vaivio, 2001, and Rikhardsson and Kræmmergaard, 2006).

Our results also demonstrated that the State was willing to enhance the finance and accounting processes. But it took time to raise the qualifications of the employees hired to match the required skills. Interestingly, the problem of retaining skilled people (Kumar *et al.*, 2002, Timbrell, 2008) did not emerge as a major problem in our interviews.

Based on the results in Tables II-VII, the three departments we studied seemed to have a similar perception of accounting and finance skills. But the perceptions of the situation (except for the ideal skills) appeared to fluctuate depending on the functions of the employee being interviewed (the “ethnic” groups). The most important difference was found between accountants (ERP end users) and other “ethnic” groups. It seems that accountants are less aware of the necessity to have a higher level of educational background. On the other hand, they requested more ERP coaching, in which they showed ill at ease. It is important to point out that accountants’ interviews were the most difficult to do as they were less open and less happy to meet with us than the other “ethnic” groups. Finally, we noted that this is the Project

Leader and the external consultant who have the better global vision of the situation and the importance of making changes in matter of accountants' job profiles.

6. Suggestions for future research

Based on our small sample size, one problem we encountered was different answers obtained from the same ethnic group (see the results in Tables II-VII). In this case, we noted all the answers in the Tables, but we chose the most frequent answer for our analysis.

As described in section 3.4 (Population), we first aimed to study two levels of ethnic groups: departments and functions but, again, due to our small sample size we decided not to analyze the ethnic group "department". However, we assume that this stratification is relevant and merits further research.

We found that the following characteristics influenced participant perceptions: 1) position (function), and 2) date of hire (e.g., before or after the implementation of the Integrated Financial System). We found that situations (e.g., organization, function type) were influenced by: 1) department type (e.g., size, activity), and 2) service type. This confirms our choice to explore the perceptions of different "ethnic" groups. In our opinion, future research should consider this sample's stratification, and ensure that questionnaires are sent to the most diverse group of employees possible. We recommend testing perceptions among different "ethnic" groups, or at least from accountants and Accounting Managers.

Again, because of our small sample size, statistical analysis would not be appropriate and at this stage of our study. We bring to mind that this research is based on exploratory approach, which means that our goal is to reveal trends that can be used to design a new, more targeted questionnaire to conduct a national survey and obtain more generalizable results. Despite the fact that our fieldwork is founded on a rigorous and methodical approach, a limitation of our study is that it does not allow us to use a research hypothesis methodology. Nevertheless, in response to our research question, we have observed that ERP systems emerge as a change driver in public administration finance services. Based on this, we intend to enhance support for our arguments in subsequent research through the use of a formal research hypothesis method via quantitative surveys.

Our results must be corroborated before they may be generalized into other business contexts. We would mainly suggest testing the level of accountants' educational backgrounds, and the ideal skill sets necessary to work effectively with the new accounting tools. We propose focusing primarily on these two subjects, and ignoring the role of accounting functions, as our research suggests these answers were less relevant. Nevertheless, and to our knowledge, this research is the first to highlight the fact that ERP implementation in the public sector provokes profound changes in a professional group such as accountants. What remains partially unexplored, even after the discussion of our findings, is the spectrum of skill-sets and knowledge required and the kind of educational background that is most suitable for accounting staff working with an ERP system. Consequently, we consider that this subject should be of interest for further research.

In conclusion, two major issues emerged from our interviews: 1) Government Bookkeepers and accountants lack technical or specialized accounting knowledge, and 2) lack sufficient understanding of global business processes. We would advocate upgrading accounting and finance functions in the government we studied. This issue was highlighted during the CFI implementation, and we believe a general trend is already underway. Training has become better organized, and new hiring has begun to target prospective employees with higher qualifications. However, we recommend continuing these actions and focusing on specialised knowledge in accounting and ERP systems. It would also be useful to impart the importance

of a global vision of business processes and of the State's strategy to accounting and finance employees.

We also recommend better analysing the necessary skill sets for current tasks, as well as rewriting job descriptions. Finally, we suggest paying more attention to the educational backgrounds of prospective hires.

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Appendix

**Interview Transcript
ERP-Agency project**

Date: Interviewed by:

1) Person interviewed
 - Department/service:
 - Function:
 - In the function since:

2a) Number of users of CFI
 - Department:
 - Service:
 (If available, obtain list of staff with: service, function, age, gender, type/level of access...)

2b) Describe the profiles of users within the finance department before implementation of CFI (2002): skills, knowledge, educational backgrounds, functions (obtain job descriptions if available)

2c) Describe the profiles of users within the finance department post implementation of CFI (2009)

2d) Describe the desired profiles of users within finance department (=ideal profile)

3a) Describe the organization of the department before/after CFI (obtain organizational charts if available)

.....
.....

3b) Describe organization of the finance service before/after CFI (obtain organizational charts if available)

.....
.....

4a) How would you evaluate your general satisfaction with the CFI concerning the

	1 = poor			6 = very good		
Implementation phase:	1	2	3	4	5	6
CFI's use:	1	2	3	4	5	6
Adequacy of Accounting staff:	1	2	3	4	5	6
Organization of your service:	1	2	3	4	5	6

4b) What are the main positive points of CFI?

.....
.....

4c) What are the main negative points of CFI?

.....
.....

5) Please give your general impressions regarding the changes in human resources and the organization (resistance to change, dysfunctions ...)?

.....
.....