10-2008

RESOURCES FOR CONFIGURABILITY IN AN ORGANIZATIONAL PROJECT OF ERP IMPLEMENTATION: A CASE FROM THE ITALIAN PUBLIC ADMINISTRATION

Samantha Ducati
Autonomous Province of Trento, Mountain Basins Service, Italy, samantha.ducati@provincia.tn.it

Gian Marco Campagnolo
University of Trento, Faculty of Sociology, Italy, gianmarco.campagnolo@soc.unitn.it

RESOURCES FOR CONFUGURABILITY IN AN ORGANIZATIONAL PROJECT OF ERP IMPLEMENTATION: A CASE FROM THE ITALIAN PUBLIC ADMINISTRATION

Samantha Ducati, Autonomous Province of Trento, Mountain Basins Service,Via G.B. Trener, 3, 38100 TRENTO, Tel. 0461 495556, samantha.ducati@provincia.tn.it

Gian Marco Campagnolo, University of Trento, Faculty of Sociology, P.zza Vieneza 41, I-38100 TRENTO, Tel.0461 881461, gianmarco.campagnolo@soc.unitn.it

Abstract

In the present work we try to represent the resources for the configurability of technical, managerial and social elements that have been worked out to implement the Project System module (PS) in the Trento Province institutional context, where the push of the new public management is intertwined with the imagination of SAP R/3 software vendors to provide industrial solution for the public administration. We describe how the technological trajectory of the PS module has been modified to meet the Province organizational project of supporting the programming and planning activities. While the primary idea was to make the operative services more responsible, leaving the monitoring and control activity to the staff services, the final accomplishment has been that of a tool that completely forces the data implementation, with the consequence that it is the system that drives operative services work.

Keywords: Configurability, Procurement, ERP systems, New Public Management.

1 INTRODUCTION

This research concerns an extensive field study on the institutional context of an organizational project of procurement, implementation and post-implementation of enterprise systems in an italian Public Administration. The field study has been the Province Electronic Information System (S.I.E.P) of the Autonomous Province of Trento where a verticalization of SAP R/3 for Public Administrations (Industry Solution for Public Sector – ISPS) has been developed since 2002. In particular, the field of the research concerns a specific SAP R/3 -ISPS module called "Project System" (PS) used to manage the activity of planning and programming of the Investment Plans. Project System is used to manage Province's investments plans, projects and periodic expenses programs. In the present work we try to represent the resources for the configurability of technical, managerial and social elements that have been worked out to implement the Project System module (PS) in the Trento Province intitutional context, where the push of the new public management is intertwined with the imagination of SAP R/3 software vendors to provide industrial solution for the public administration. We describe how the technological trajectory of the PS module has been modified to meet the Province organizational project of supporting the programming and planning activities. While the primary idea was to make the operative services more responsible, leaving to the upper level staff services only the monitoring and control activity, the final accomplishment has been that of a tool that completely forces staff services data implementation.

The NPM is the alternative model to the bureaucracy model, and was used in most of Governments, under the pressure of important international organizations like OECD and the European Union which have suggested to the various Governments to reduce the gap between costs and services granted, to pursue efficiency, adopting management models like a private company. Unlike the bureaucracy model, where rules and laws guide the administrative action and there is a rigid hierarchy, in the NPM the contract and the responsibility manage the activities of the organization. The administrative action, in its components (decision, implementation and verification) is performed by the contract: the action of government (policy) and the action of public manager take place through transactions and agreements between the parties. The responsibility takes on an important value: who decides takes responsibility for its decisions and who manages takes responsibility for translating results into what had been decided by politicians. It follows that the verification activities are designed to verify the results achieved against objectives assigned (effectiveness), the cost what has been achieved (economy), how many resources were used to obtain the result (efficiency). The public managers, in NPM have a strong autonomy to pursue the objectives assigned and the functions of staff become necessary to support the manager's activity. Another consequence of the logic of contracts and transactions is to reduce the size of the PA. The outsourcing of functions from the State to other organizations, through contract system, aims to pursue the principles of administrative efficiency, economy and effectiveness, easier to follow through a "slim State". When we talk about outsourcing in the NPM, the Government pursues its objectives by outside organizations, through a contractual relationship between the Government and organizations, which can be both public and private. In the first case a functional area, a particular public policy is administered by autonomous structures known as "agencies" which have full autonomy but depend financially and politically by the Executive. Otherwise we talk about privatization, when the Executive sells or external specific activities to organizations which operate in free markets, and therefore seek to profit. With the NPM model, the politicians are responsible to identify the objectives of public policies and programs, according to the electoral mandate received by the community (policy responsiveness), and the public managers are responsible, through their strategic management, to translate the objectives into results (accountability) (Lippi and Morisi, 2005). In strategic management, the programming activities are considered very important, through which the goals are set and the resources are allocated to achieve them. The programming activity in NPM is a contract between the policy that outlines programs, objectives that are based on principles, ideologies, that have to be achieved, and the administrative leadership that is responsible for the implementation of programs and objectives established, to give them concrete realization. In short, the policy has the "sphere of address", while the public managers are responsible for "management". Therefore, in strategic management is considered a priority the allocation of the

"budget" to the public managers, which includes financial, human and technological resources, needed to achieve the objectives assigned by the politicians. Budget is crucial in programming activity and it is negotiated by the managers with politicians (Lippi and Morisi, 2005).

2 LITERATURE REVIEW

The importance of the new technologies in the new public management grows very quickly: the ICT is an essential support to innovate the informative, organizational, decisional and control models of the Public Administration (Dalmonego 2004). Moreover it helps the introduction of new managerial instruments to facilitate the informative exchanges with the external world with improvement of the efficiency of the services and one greater active participation of the citizens, of the enterprises to the political and institutional life. ICT serves also to redesign the administrative procedures, facilitating the decentralization of the functions towards the agencies and the organizational structures nearer the citizens. In order to favour a fast development of the ICT, the Public Administration (PA) has put into effect important normative reforms, such as digital signature, e-government, e-procurement, and so on. Consequently many PA have chosen to use the Enterprise Resource Planning systems (ERP) to support this important change.

When we speak about the ERP systems, we often refer both their flexibility (customizations) through a process of mutual adaptation (Orlikowski 1992) between organizational changes and reconfigurations of the software through several techniques, and their rigidity such to force modifications of the organizational structure of P.A. in order to adapt it to systems ERP, the "vertical standardization" (Davenport, 1998). The reasons of this appearing contradiction in which systems ERP appear both rigid and flexible is due to various considerations. The processes of PA must be effectively adapted to models defined with a degree of rigidity, but inside of these, there is a high possibility to personalize the development of the single activities (customizations). There are various modalities of customization. One method consists in developing new applicative routines in order to automate the parts of process not supported from the ERP, connecting them with the product original standard. Some ERP, have opportune predispositions that concur to easily connect added developments without having to bring modifications to the programs. Such developments, however, if extensive and too much numerous, can create ties and problems in occasion of the new passage release(in average there is a new version of product every 3-5 years). The plan of organizational change about the introduction of a system ERP must be confronted with the rigidities and the models (best practice) that the package software imposes. The PA uses plans that organize the hierarchies, the tasks, the roles and the relations: this is the visible and "official" organizational structure that is known by the managers of the public sector. The introduction of an ERP is able to transform the relations, the procedures, the activities, the tasks, the minds, the mood of the persons that works in the organization in an invisible and surreptitious way. Workplace activities are re-engineered and modified in order to fit the new technology. Hierarchies that define roles and tasks get rapidly outdated.
ERP systems are taught as rigid systems. The apparel of such technologies seems to constructs organizational action in terms of procedure enactment. It dissolves the processual meaning of organizational action and reduces the space for open interaction and argument. It imposes significant constraints to less structured ways of working (Sawyer and Soutwick 2002). The efforts and the time spent for this reason (often several years) reveal how such technologies are implemented only through the local negotiation of relevant portions of the system. The genuinity of such adaptation has been doubted with the argument of the consistent constraints that such technologies bring together (Fleck 1994, Kallinikos 2002, Soh et al. 2000). The logic underpinning the system and its general structure, indeed, cannot be completely erased in the local adaptation. Information packages are not infinitely malleable (Hanseth 2000, Hanseth and Braa 2000). However, software is a 'non-material artefact' and therefore its properties are hard to ascertain. They may only ultimately become known when a package is installed and used. This then prompts the question of how user organisations make effective choices in a context of uncertainty about the effectiveness of vendor offerings and their appropriateness for their own organisation. In particular, user organisations have to handle the trade-off between

customising the package to suit the particularities of organisational practice and, at the other extreme, adopting the system wholesale and adjusting the organisation to meet its exigencies. What is the subsequent career of the software solution within the user organisation (its 'project' lifecycle) is a further dimension of the ERP systems implementation configurability.

3 THEORETICAL FRAMEWORK

A stated in Scott (2000), by institutional context we mean the ways enterprise systems influence and are influenced by the context of procurement, implementation and post-implementation, including influences at the individual, group, organizational and societal levels. Configurability is a notion that has been used to discuss the possibility that information technology is adapted to a diversity of users who are included as identifiable persons in the testing of technologies, and to other artefacts within the physical space (Binder et al., 2004). In sociological analyses of design cultures, users have been also conceptualized as imagined by the designers of a technology (Akrich, 1992;Woolgar, 1991). Engineers, and other actors involved in the design process, configure the user and the context of use as an integrated part of the entire process of technological development, even when they are not physically involved in the testing of technology. However, adopting a local view on the context of use, these studies overlook how the realization of software takes place through a distribution of responsabilities across different social groups (political representatives, managers, technology suppliers, screen workers) at different times (procurement, implementation and post-implementation) in the evolution of the relationship between software and organization. Moreover, in the case of SAP R/3, tecnology suppliers are able to build representations of organization that capture an enormous breadth of activities and imagine commodified packages that can be implemented across many different industrial sectors and nations (Pollock and Williams, 2008). The research question we develop in our case study is: what are the strategies that the single organization puts in place in order to configure the large array of technical, managerial and social elements that seem that are being worked out in the procurement, implementation and post-implementation of enterprise systems like SAP R/3?

4 METHODOLOGY

This research concerns an extensive field study on the institutional context of an organizational project of procurement, implementation and post-implementation of enterprise systems in an italian Public Administration. The field study has been the Province Electronic Information System (S.I.E.P) of the Autonomous Province of Trento where a verticalization of SAP R/3 for Public Administrations (Industry Solution for Public Sector – ISPS) has been developed since 2002. In particular, the field of the research concerns a specific SAP R/3 -ISPS module called "Project System" (PS) used to manage the activity of planning and programming of the Investment Plans. Project System is used to manage Province's investments plans, projects and periodic expenses programs. This activity combines the usage of a set of SAP R/3 modules with political and management goal-setting activities. Project System is used to manage investments plans, projects and periodic expenses programs. It has a strategic value. It is connected with other SAP modules in use: the COP (financial accounting module) and the DDG modules (a newly created module for "delibere" and "determine" (laws and regulations) especially for the Trento Province). Having identified the departments that adopt the module of ERP about the investment planning, the methodological instruments that we used in order to carry out the analysis have been:

- organizational ethnography, in order to comprise the extension of the organizational actors: we observed the physical context when the workers use ERP/IP: offices, disposition of furniture, of the computers. We analyzed face-to-face communication, phone calls, mail exchanges...
- document analysis: analysis of the mediated communication, contents of the circular letters, mails, who is sending a communication and why, which is the receiver. In addition, research participants

were asked to fill a form (media log), in which they marked the activities taking place through telephone and mail in a given period of time;
- ethnography of the infrastructure: analysis of the architecture of ERP and, in particular, of the module of investment planning (IP) and its connections with the several external softwares and networks of computers; analysis of the computer licences;
- in depth interviews to the key actors that emerge from the above-named analysis of the field, so to understand the multiplicity of the points of view on a given artifact, and to comprise the story of organization.

5 CASE DESCRIPTION

SAP has been adopted by PAT in order to (i) pursue administrative and accounting de-centering; (ii) flanking financial accountability with economic accountability; (iii) operate business management to ensure efficiency, efficacy, economicity and transparency and (iv) monitor significant and strategic projects included in the political planning functions. In our case, the activity of the creation and the update of Investment Plan (IP) and the role of the SAP-PS module is described. The IP update requests the work of a team, where each staff service and each responsible must follow a procedure established by local regulations. The following table reconstructs the the approval of the investments plan (IP), a procedure affected by the use of three SAP modules at different times: the local parliament regulatory provisions module (Delibere e Determine di Giunta: DDG); the Financial Management module (COP); the Project System module (PS):

	Staff Service no. 1: Planning	Staff Service no. 1: Financial Affairs	Operative Services	Political apparatuses	SIEP	
draft of the IP	Support and Collaboration	Support and Collaboration	drafting the IP deliberation		the draft is already in SAP	DDG PS
IP formal verification	preliminary examination	preliminary examination	Service Director signs the form		print and send with formal letter	
Staff service judgement without obs.	30 days to express judgement	30 days to express judgement	confirm and print the IP; send to STAFF	include the IP in the agenda	confirm and print the IP; send to STAFF	DDG PS COP
Staff service judgement with obs.	30 days to express judgement	30 days to express judgement	modify IP; send to STAFF; Cc to others.	include the IP in the agenda	confirm IP; send to STAFF; Cc to others.	
accountancy irregularity	find accountancy irregularity	find accountancy irregularity	cancel the IP from SAP	give back the IP without inclusion	cancel the IP from SAP	
relevant accountancy irregularity	inform the President of the Province	inform the President of the Province	cancel the IP from SAP	The President of the Province is informed	cancel the IP from SAP	

Table 1. The management of the Investment Plan

There is the Operative Service that creates, updates the Plan (in SAP are used modules DDG and PS: data are not definitive) and submits it to the control to the upper level Staff Services that control the regularity of it and issue their official judgements (if there are observations, the service is blocked in the official adoption of the Plan, until it changes the Plan: in SAP the data are deleted or modified: modules DDG and PS). If the irregularity is relevant, the Staff Services inform the President of the

Province of Trento. When there are the positive judgements, (in SAP are used modules DDG, PS and COP-FM: data are made definitive) the Plan is signed by the manager of the Operative Service, by the General manager of the Department of the service, and by the political responsible. In order to comprise the extension of the organizational and interorganizational actions affected by the usage of SAP in this case, we focused on a circumstance where the local regulations concerning Investment Planning have been modified, with a corresponding major maintenance of the system, called evolutionary maintenance. By observing the evolutionary maintenance step-by-step, we had the opportunity to track the various actors that are involved in the post-implementation activities. Among the various resources for configurability of the organizational project of PS implementation we have identified: (i) the SAP vendor suggesting implementation strategies; (ii) the local maintenance providers negotiating for limiting the work of customization of the software; (iii) the sub-contractors finding shortcuts to provide the customization identified by the local maintenance provider; (iv) the appointment of specific roles (key users) for the customization of each SAP module inside the organization (Staff services; Planning Service and Financial Affairs Service); (v) the 'schermishes' eacted by each monitoring and operative service employee for the management of the daily work at screen; (vi) and the Staff Services attempts to maintain the coherence of all this with local and national regulations.

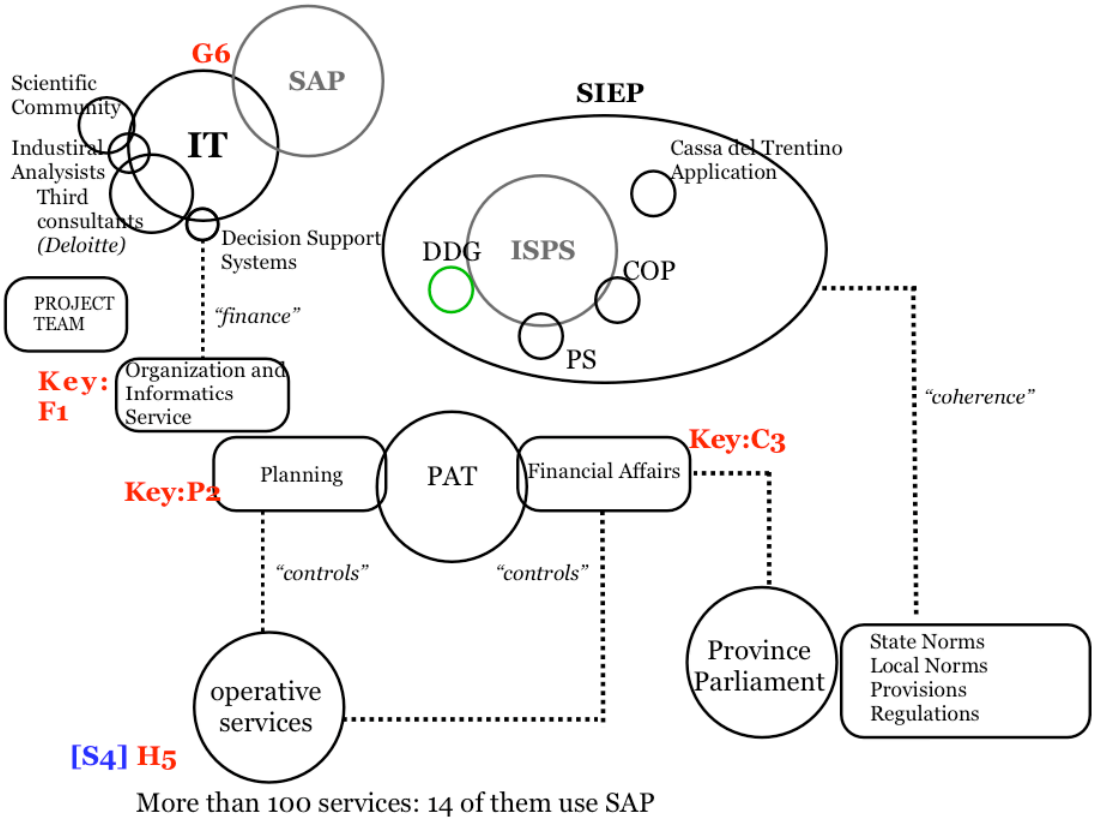

Figure 1. The distribution of responsabilities across space

We noticed that the responsabilities of the realization fo the evolutionary maintenance aren't only distributed within the actors that are inside the borders of the official organization. It also involves the scientific community: the SAP Company, the companies that customize the software (Informatica Trentina S.p.A. and third analysts); a specific project team that has been created for the study of the introduction of ERP in the organization – the research participant F1 has been part of that team); specific roles for each module of SAP that have been appointed as key users inside each Staff Service - P2 for Planning Service and C3 for Financial Affairs Service; the Staff Services, for the monitoring of operative services where the research participants S4 and H4 are working; the Province Parliament, where the information coming from SAP reports is used to take political decisions. The distribution of responsabilities for the realization of the post-implementation activities has also an historical dimension. While for the adoption/procurement phase, the above mentioned scientific communities and the project team (created for the acquisition and the implementation of SAP and then dissolved) were involved and for the implementation and maintenance phase there is Informatica Trentina S.p.A. with third parties industrial analysts, the above mentioned project team (for the implementation) and the key users for each module (P2, C3,….), F1, the staff services (P2 and C3), and the operative services (S4, H5) are the main actors using the system in the post-implementation phase.

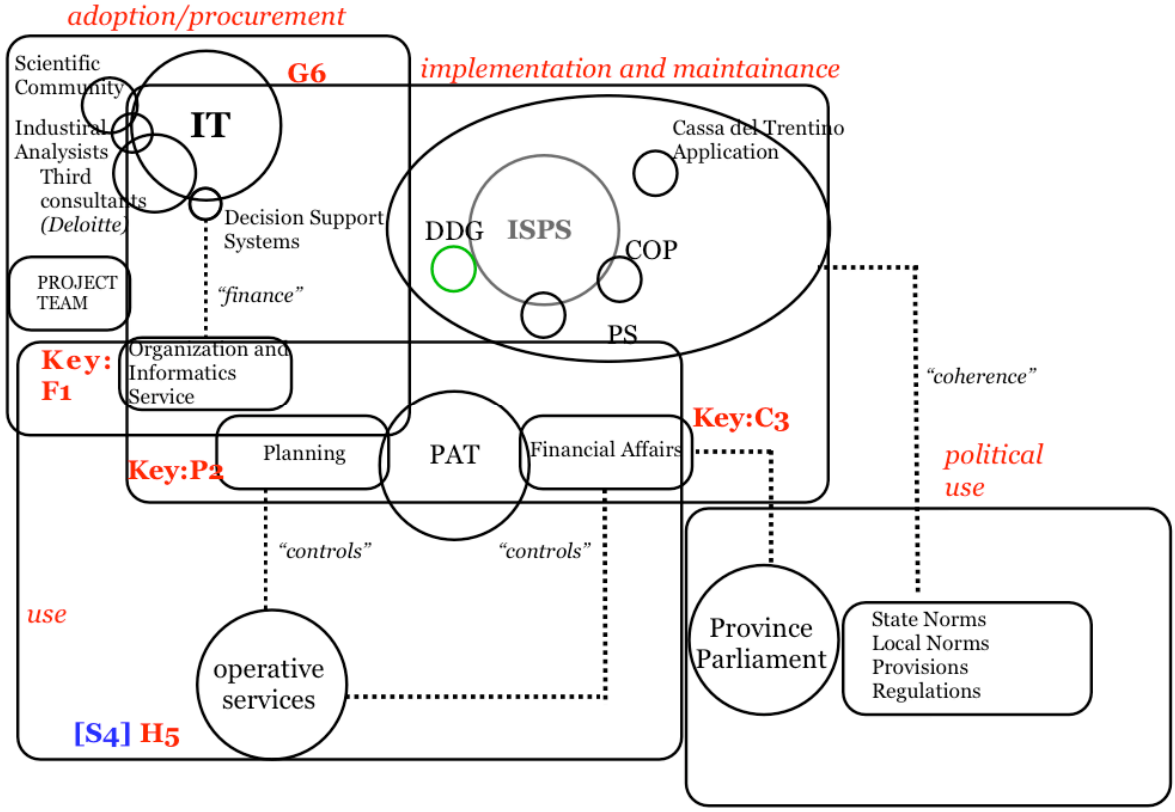

Figure 1. The distribution of responsabilities across time

In the remaining of this session, we report some excerpts of interviews with F1: a member of the SAP procurement project team; P2, the key user of the Planning Service; and H5 for the operative services.

5.1 Procurement

F1 works in Organization and Informatics Service in Province of Trento and links the software developers to the organization and participated to the SAP project in PAT since the beginning. F1 attends to the adoption, the implementation, the maintenance, the use of SAP in Province of Trento. F1

has a general view of SAP. She thinks that the initial target of the module PS introduction has been modified: instead of a tool for he operative services, with a consequent responsability of them, there is a tool that completely forces the data implementation with the consequence that it is the system that drives. The primary idea was to make the Operative Services more responsible, leaving the monitoring and control activity to the Staff services (Planning and Financial Affairs services), but this has been modified. She told us that:
"we modified the objective...instead of a tool representing the Operative Services, with a consequent responsability of Operative Services to update it...we have a tool that completely forces the data implementation...with the consequence that it is the system that drives...The idea was to make the operative services more responsible, leaving the monitoring and control activity to the staff services...but this has been lost..."

5.2 Implementation

The Province of Trento appointed some employees as responsible for the implementation and maintenance for each module of SAP (key users) inside the organization: for the module PS there is P2 who works in the Planning Service. P2 has a sectoral view of SAP specifically about PS. When the Province acquired the COP module (Financial Accountability), the PS module (Project System) has been also acquired. That was without any customization. The PS did not have the characteristics for the activity of planning and programming (monitoring the information): it was a product for private companies, it was naked, so it has been decided to do the customization for the accountability aspects to link PS to other modules of SAP, for the general information for the staff services and the political demands, but also for the operative structures to have operative information. She told us:
"When the Province acquired the COP module (Financial Accountability)...they were given also the PS module (Project System), that was made by SAP, without any customization. Then it did not have the characteristics...since it was a product for private companies...it was naked and raw...then it has been decided that...like this it was not performing optimally...if we wanted to pursue the expected result...that is monitoring the information...it must have certain features...otherwise...it is useless. Then we had to do the personalization. Then...in order to define these characteristics...some has been done by the Planning Service...to have information on the investment plans...like localization...some has been done by the Financial Affair Service for the accountability aspect...but also the structures [i.e. the operative services] to have operative information..."

5.3 Post-Implementation

The operative services (where works S4 and H5), are the services that adopt the Investment Plans as required by the local norm of programming.
For the creation and management of the Investment Plans, the operative services have to use module PS of SAP. In parallel with PS they use other forms of management plans, such as excel, because SAP cannot be used as a flexible instrument, the data entered are not modifiable: the data are officials, while Excel can be used as a draft, as simulation, and furthermore it has a more visible format, more clear than PS. The customization of PS has created new reports, new data required blocking the work if not incorporated in PS: when there is a customization the practice changes: S4 and H5 must learn the new way of working. In the reported observation, the service X has to approve and finance an intervention (part of an Investment Plan). We are in the H5 office. She has to do the determination of approval and financing (which involves the PS and DDG module). H5 accomplishes the following activities: she verifies that the amount of the project does not exceed the budget available for non-significant interventions, foreseen in the investment plan. In order to control it, she goes and watch an excel table that is reproducing the entire investment plan. She says:
"It is easier, because in SAP you can not see the amount for each non-significant intervention...perhaps there is a particular report...when I have some time I must go and see if it is possible to print this kind of information. However...we are more comfortable with this file: it is immediate...look: now I input the cost of the intervention and I modify the available budget: it is easy

to read. The excel table duplicates the entire plan, but in a more visible format...more clear...we put bold the approved intervention and normal those that have still to be approved...
After verifying that, H5 prepares the determination draft in word. She says: *"Now I do the determination in word, then I create the anagraphic of the intervention in SAP-PS. There is not a fixed order: I can do that even before....Recenlty they modified the application in order to do the description of the interventions...we will see...we had a training course...then there was a trial period...but actually I have to go back to my notes...it is always like this until when you learn it..."*

6 DISCUSSION

We described how the technological trajectory of the PS module has been modified from the primary idea to make the Operative Services more responsible – in the pursue of the original goal of administrative and accounting de-centering -, to the final accomplishment of a tool that completely forces the data implementation. Firstly adopted without any customization, the PS module has been strongly personalized according to the Planning Service Key User suggestions, to meet Staff Service working practices. Despite this personalization effort, Operative Service still need to manage their work with duplications of the same data with text editors and worksheet applications. The analysis of the SAP usage from the point of view of operative services shows improvisations, applications of remedies and a continuous process of adjustment, comparable to bricolage (Ciborra 2004). Local organizational processes concerning, e.g., the approval of Investments Plan - how a plan is made, its structure, how it is now and how it will be using the processes of SAP -have not been analyzed prior to the SAP PS module introduction. Instead, what has been done is changing the SAP module according to local organizational process. This required a long period of time between each further module implementation, with the consequence that a module was implemented even after some years from the former.

7 CONCLUSION

We still know few about the distribution of responsabilities for the realization of the information system and about the procurement of resources for its configurability over time. We still know few also about how this distribution of responsabilities begins with the procurement practices and has consequences in *(i)* changes of the individual work, *(ii)* organizational development of the public administration and *(iii)* evolution of the technical knowlegde on configurability. The current study proposes an integrated research on software infrastructures that is not limited to the components afferent to the implementation vicissitudes. It considers all the relevant components – technical, social and managerial components – in their mutual coherence, taking into account, in an integrated manner, and across time, the perspectives of the various actors involved in the practices of procurement of the competences required to reduce the risk that the information system does not correspond to the objectives of the organization: the project team, the Staff Service Key Users, the controls over the Operative Services work at screen. Through this approach, it is highlighted that the success in the realization of the system depends upon the competition of actor-networks in the course of the social construction of the procurement practices of the required decision-making competences in terms of ERP implementation. With this, it is also necessary that the social research on information systems makes a step back as to the implementation studies (that is, studies on how the organizational knowledge negotiated, embodied and sedimented in the technological artefact becomes appropriated in use), devoting the same attention to the meta-level of the social, economical and institutional components that concurr to the combination of the competences deemed necessary to the definition, enactement and verification of the same technical knowledge. The research question becomes then: what are the necessary competences and knowledge tools that make accountable the choice of an information system such as an ERP and how are they selected and performed? The main relevance of this approach is to overcome a monolithical vision of ERP systems to one hand and that of the organization that has the only binary choice to change itself or to change the system to the other, by

emphasizing the multiplicity of action and decision plans that are implied in the procurement practices as plan concerning *the knowledge about technical knowlegde*.

References

Akrich, M. (1992) 'The De-Scription of Technical Objects' in W. Bijker and J. Law (eds) Shaping Technology/Building Society: Studies in Sociotechnical Change, Cambridge, MA: MIT Press.

Binder, T., De Michelis, G., Jacucci, G., Matcovic, K., Psik, T., Wagner, I., Supporting Configurability in a Tangible Augmented Environment for Design Students. Personal and Ubiquitous Computing 8, (2004), 310-325.

Ciborra, C. (2004). The Labyrinths of Information: challenging the wisdom of systems. Oxford University Press.

Dalmonego, I. (2004) L'ordinamento finanziario e contabile della Provincia Autonoma di Trento, degli Enti locali e degli Enti funzionali. Volume II: Strumenti di programmazione bilanci e contabilità in un sistema che cambia. Giunta della Provincia Autonoma di Trento.

Davenport, T. (1998).Putting the Enterprise into the Enterprise System. Harvard Business Review, 76(4), 121-132.

Hanseth, O. and Braa, K. (2001) 'Hunting for the Treasure at the End of the Rainbow: Standardising Corporate IT Infrastructure', Computer Supported Cooperative Work, 10: 261–92.

Kallinikos, J. (2004a) 'Deconstructing Information Packages: Organizational and Behavioural Implications of ERP Systems', Information Technology and People, 17, 1: 8–30.

Orlikowski W. (1992). The duality of technology: Rethinking the Concept of Technology in Organizations. Organization Science, 3(3). 298-327.

Lippi, A & Morisi, M. (2005), Scienza dell'amministrazione, Bologna, Il Mulino.

Sawyer, S. (2000) 'Packaged Software: Implications of the Differences from Custom Approaches to Software Development', European Journal of Information Systems, 9: 47–58.

Scott, W.R., 2000. Institutions and Organizations. Sage, London.

Soh, C., Kien, S.S. and Tay-Yap, J. (2000) 'Cultural Fits and Misfits: Is ERP a Universal Solution?' Communications of the ACM, 43, 4: 47–51.

Woolgar, S. (1991). Configuring the User: The case of Usability Trails. In J.Law (eds.), A Sociology pf Monsters: Essays on Power, Technology, and Domination. New York: Routledge.