The Impact of Business Process Modeling During the Implementation of Electronic Records Management Systems: Theoretical Framework and Empirical Studies

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ABSTRACT
In introducing Electronic Government solutions, in particular Electronic Records Management Systems (ERMS), public authorities require a comprehensive framework concept to meet the multidimensional integration need. Before the implementation of new software processes a software analysis and design should be conducted. This paper reports on our research in progress to observe the diffusion of Business Process Modeling (BPM) during Electronic Records Management projects.

1. PROBLEM DESCRIPTION

The "eEurope 2005" initiative of the European Commission, which is also part of the Lisabon strategy, has the objective to develop modern public services and a dynamic environment for e-business through widespread availability of broadband access. In particular the public administration and their services should be modernized by an increased usage of modern information technologies (EU, 2006). Within the eEurope 2005 action plan there are efforts on the one hand to offer online public services and on the other hand to increase productivity, effectiveness within the public authorities and across organizations and national borders by means of digital technologies accompanied by organizational change and new management skills (EU, 2005; Grönlund, 2002). This includes not only external governmental operations via E-Government Online Services but also internal operations by the use of GIS[1], ERMS[2], WMS[3], ERP[4] and much more in combination with modern management methods like Change Management, Project Management, Business Process Management, Controlling, Quality Management and so on (Grönlund, 2002). Focusing on administrative procedures the purely electronic processing of

administrative affairs should lead on the one hand to a higher service quality and democracy for citizen and on the other hand to higher effectiveness, transparency and economies in particular financial resources (Antirroiko & Mälkiä, 2006). The objectives for E-Government solutions are according to an E-Government study of the German Research Center for Artificial Intelligence (DFKI) in 2003 are illustrated in figure 1.

Beside many other initiatives like E-Procurement, E-Learning, E-Health, and so on the management of electronic records is one of the most important issues in the government's modernization program (Traunmüller & Wimmer, 2001). Most requirements on Electronic Records Management Systems (ERMS) are predefined on national level through country specific concepts like the „DOMEA[5]" concept in Germany, the "ELAK[6]" concept in Austria, the "GEVER[7]" concept in Switzerland or "The National Archives[8]" concept in UK (Müllner & Grimm, 2006). These concepts should assure that all deployed ERMS meet the requirements respect to national right, organizational and operational structure and functionality, so that a quick and high quality as well as an area-wide and interoperable implementation could be realized (TNA, 2001).

The transition from traditional administrative processes to E-Government processes means not only an adoption of previous (non-electronic) procedures onto electronic ones but also it opens new possibilities and challenges regarding reorganization and process reengineering (Wimmer, 2002, pp. 149-156). Before the implementation of new software a process analysis and design should be conducted (Matheis et al., 2006). A use of Business Process Management (BPM) methods after important technical decision or implementation of new software can only yield to a sub-optimal result. Nevertheless most of actual E-Government

Figure 1. Objectives on implementing e-government (Scheer et al., 2003)
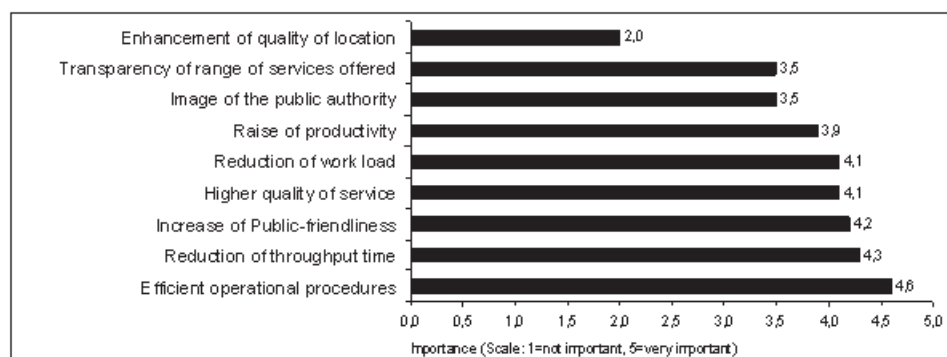
projects are in progress without using BPM (Traunmüller & Wimmer, 2003). Some reasons for that are:

- The diversity of public administration processes, heterogeneity of participants as well as procedure specific, local and legal regulations allow only a restricted design of standardized processes (Klischewski & Lenk, 2002)
- A multitude of administrative processes are decision-making processes which require situation specific workflows and are carried out in the person in charge's sole discretion (Lenk & Traunmüller, 2000)

- A lack of documentation of actual procedures and individual operating know-how of each executive (Lenk & Traunmüller, 2000)
- Most of the already successfully deployed BPM methods in private industries can only be restricted applied to public administration processes (Scholl, 2005)

Public authorities have now the problem, that ERMS should be implemented but still there are missing adequate methods to exactly design administrative processes.

Figure 2. Research process model
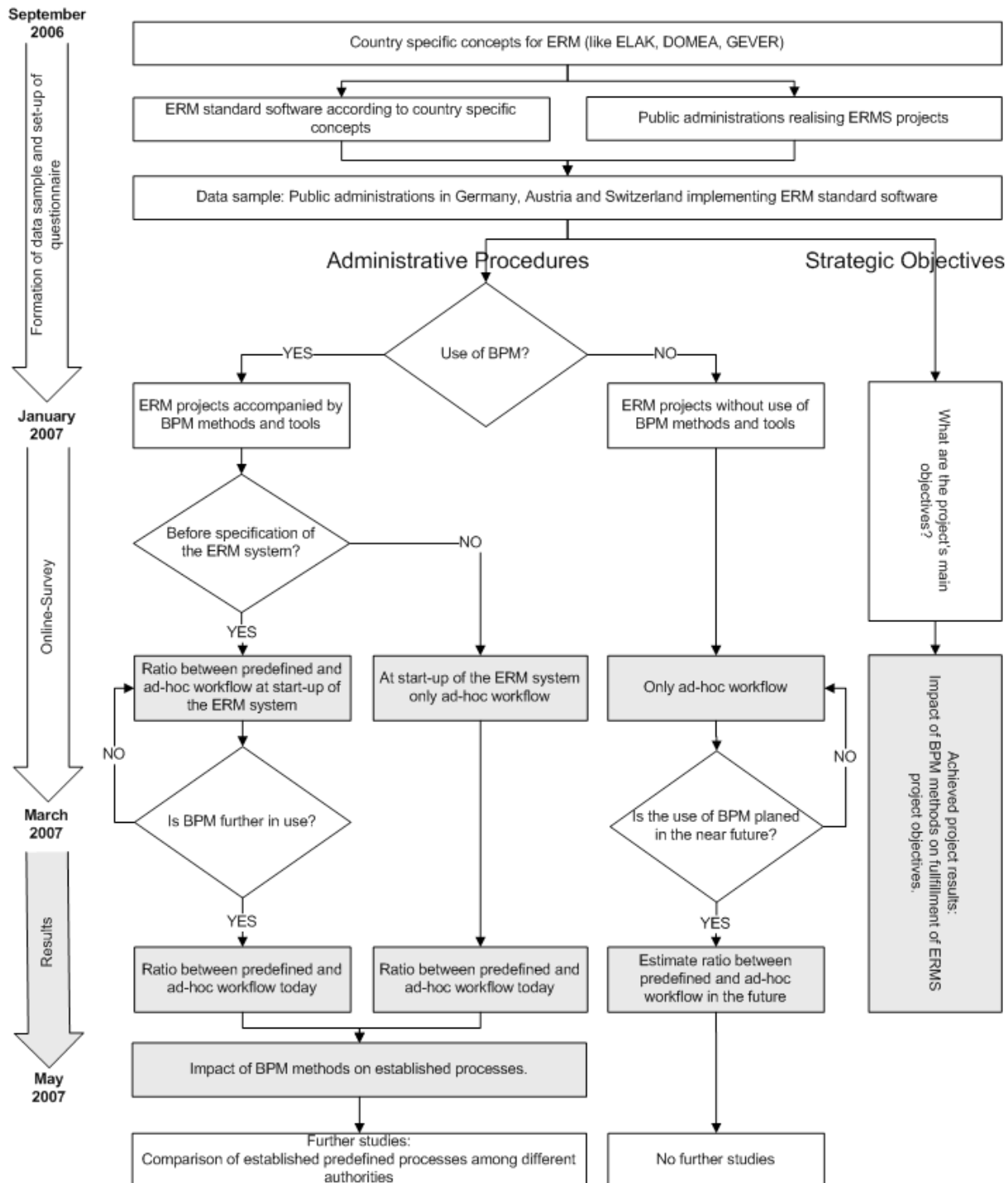
2. RESEARCH FRAMEWORK

In order to systematically manage the complexity of software systems a top-down approach can be used. (Lee, 2005). Regarding to the transformation of administrative processes for a specific use case the following top-down structure can be designed: process -> activity –> work step. In general Electronic Records Management Systems allow the following possibilities of workflow functionality for the flow of files (Müllner & Grimm, 2006):

- By predefined workflow: From the beginning to the end of the process all activities and work steps are strictly predefined.
- By ad-hoc workflow: For a specific use case the process starts with a predefined standard start activity. All following activities are defined by the person in charge.
- By semi-predefined (mixed) workflow: For a specific use case a standardized process is rough predefined by usually needed activities and work steps, but could be situation specific adapted by the person in charge.

The research question is: "In implementing Electronic Records Management Systems which BPM methods and tools are mostly used, how these influence the establishment of electronic processes in respect of predefined or ad-hoc workflows and how the impact of BPM methods on the fulfillment of project objectives is?"

According to this we can formulate the following two hypotheses:

H1:   The use of BPM methods and tools before the specification and implementation of Electronic Records Management System (ERMS) in public authorities causes an increased use of predefined electronic processes on routine processes and an increased use of semi-predefined electronic workflow on decision-making processes.

H2:   The use of BPM methods during the implementation of Electronic Records Management System (ERMS) has a direct and positive impact on the successful fulfillment of project objectives such as efficiency of operational procedures, reduction of throughput time, increase of Public-friendliness, reduction of work load and raise of productivity.

3. RESEARCH METHODOLOGY

Because of the complexity and the interdisciplinary magnitude of ERMS projects and the great number of participants, we have chosen an expert survey as research method, which allows well directed interviews in an economical and time-saving manner (see Figure 2).

The survey will be done on public administrations in Germany, Austria and Switzerland, which have implemented an Electronic Records Management System (ERMS) conforming to their respective national concepts. Implemented means that the specification of the software has already been finished and the roll-out of the final production system or pilot system has been accomplished at least at one department.

Due to their participation on all stages of the ERMS project, the experts are defined as project leader and/or head of department of the public authorities, which are realizing an ERMS project. Because of the geographic distance an online survey is chosen as the most practicable research method.

The online form will contain quantitative as well qualitative questions about following aspects: Implemented software and ERMS standard concept; primary project objects, used BPM methods, successful established electronic processes; achieved project results and further need for action.

In November 2006 the research is starting with the formation of the data sample and the collection of all contacts for the survey, which should be finished latest in January 2007. Estimated is a data sample between 150 and 200 public authorities. At the moment the questionnaire set, the data base and the online form are prepared. The survey is structured in 4 parts and will contain approximately between at least 15 and at most 25 questions:

- Part 1: General project data (5/5)
- Part 2: Implemented ERM standard software (4/4)
- Part 3: Processes and used BPM methods and tools (3/8)
- Part 4: Established processes and achieved project results.(3/8)

The expert online survey will be accomplished from January 2006 until March 2007. First results are expected in March 2007. The final report should be available not later than May 2007.

4. CONCLUSION AND FUTURE WORK

They survey will show if there is nowadays an increased use of BPM methods during the implementation of Electronic Records Management Systems in public authorities. Further, we expect to find out which BPM methods and tools are mostly used in public administrations and which impacts they have on implementing ERMS regarding process redesign, internal administrative procedures and fulfillment of project objectives. In comparing data results of different project proceedings, used methods and finally achieved project results may lead to recommendations, best practice approaches and/or further need for action. Future work will be concentrated on analyzing established electronic processes and their comparison between similar authorities in Germany, Austria and Switzerland.

5. REFERENCES

Antirroiko, A. & Mälkiä, M. (2006). Encyclopedia of Digital Government. Hershey. Idea Group Reference.

EU (2005). eEurope 2005: An information society for all. Commission of the European Communities. An Action Plan to be presented in view of the Sevilla European Council. 21/22 June 2002. Executive Summary 28-05-2002. COM(2002)263 final. Brussels: http://ec.europa.eu/information_society/eeurope/2002/news_library/documents/eeurope2005/eeurope2005_en.pdf, Last update 31-05-2005.

EU (2006). About eGovernment. Europe's Information Society Thematic Portal. The European Communities. Brussels: ttp://europa.eu.int/information_society/activities/egovernment_research/about_us/index_en.htm, Last update 01-08-2006.

Grönlund, A. (2002). Electronic Government: Design, Applications and Management. Hershey. Idea Group Publishing.

Klischewski, R. & Lenk, K. (2002). Understanding and Modelling Flexibility in Administrative Processes. *In Traunmüller, R., Lenk, K. (2002). Electronic Government, First International Conference, EGOV 2002. Aix-en-Provence.* Berlin. Springer Verlag.

Lee, K. (2005): A Top-Down Approach to Quality Driven Architectural Engineering of Software Systems. *In IEICE Transactions on Information and Systems 2005.* Oxford Journals. Oxford University Press.

Lenk, K. & Traunmüller, R. (2000). A framework for electronic government. In 2000, Proceedings, DEXA, 11th International Workshop on Database and Expert Systems Applications, IEEE Computer Society Press.

Matheis, T., Daun, C. & Loos P. (2006). Performance Measurement for E-Government Scenarios. *In Koshrow-Pour, M. (2006). Emerging Trends and Challenges in Information Technology Management. Information Resources Management Association*. Hershey. Idea Group Publishing.

Müllner, T. & Grimm, D. (2006). Applications for Comprehensive E-Government. *In Antirroiko, A., Mälkiä, M. (2006). Encyclopedia of Digital Government.* Hershey. Idea Group Reference.

Scheer, A.-W., Kruppke H. & Heib, R. (2003). E-Government – Prozessoptimierung in der öffentlichen Verwaltung. Berlin Heidelberg. Springer-Verlag.

Scholl, H.J. (2005). E-Government-Induced Business Process Change (BPC). In International Journal of Electronic Government Research, Vol. 1, No. 2, Idea Group Publishing.

TNA, The National Archives (2001). e-Government Policy Framework for Electronic Records Management. A joint Public Record Office / eGovernment Unit publication: http://www.nationalarchives.gov.uk/electronicrecords/pdf/egov_framework.pdf.

Traunmüller, R. & Wimmer M. (2001). Directions in E-Government: Processes, Portals, Knowledge. *In Proceedings of the DEXA International Workshop. On the Way to Electronic Government.* Los Alamitos, CA. IEEE Computer Society Press.

Traunmüller, R. & Wimmer M. (2003). E-Government at a Decisive Moment. Berlin Heidelberg. Springer-Verlag.

Wimmer, M.(2002). Integrated Service Modeling for Online One-stop Government. In EM - Electronic Market. Special issue on e-Government, vol. 12(3), pp. 149-156(8). Routledge. Part of the Taylor & Francis Group.

ENDNOTES

[1] GIS: Geographic Information System

[2] ERMS: Electronic Record Management System

[3] WMS: Workflow Management System

[4] ERP: Electronic Resource Planning

[5] DOMEA: DOcument Management and Electronic Archive in the public administration, Coordination and Information Center for ICT of the German Federal Administration (KBST)

[6] ELAK: Electronic Record (ELektronischer AKt), Chief Information Office (CIO), ICT strategy of the Austrian Federal Administration

[7] GEVER: Records Management (GEschäfts VERwaltung), Information Strategy of the Confederation of Switzerland (ISB)

[8] The National Archives: Public Records Office (PRO)

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