

E-government and Vanilla software: The Common System Paradox?¹

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1. Introduction

Studies about implementing Enterprise Resource Planning (ERP) systems by means of pre-engineered packaged software applications and reference models indicate that the use of standardised best practices can be problematic (Van Stijn & Wensley, 2005). Several problems and concerns are identified, e.g. difficulties in acquiring the language of best practice presented by vendors or consultants, understanding the best practice concepts, problems related to the interpretation of practices when they are enacted in the organisation, etc. There appears to be a trade-off between achieving the benefits of standardization and accommodating the uniqueness of the organisation which is sometimes referred to as the common system paradox (Lengnick-Hall *et al.*, 2004; Markus and Tanis, 2000; Newman and Westrup, 2006; Fosser *et al.*, 2008). In a competitive environment, features that made an organisation unique and hard to imitate may be destroyed because of using a “vanilla” system. However, while it is possible to customise the ERP system to fit the original business processes, this is a contested area in both industry and academia: the current received wisdom is that customisation is not recommended because of the high cost and problems with system upgrades and maintenance difficulties (Holland *et al.*, 1999; Fosser *et al.*, 2008).

There is also a wide-spread use of vanilla software and best practices in the implementation of e-government systems. In Denmark the Danish e-government initiative, *Project eGovernment*, has been initiated by the central government and the regional and local administration in order to promote and coordinate the transition to e-government in the public sector (The Digital Task Force, 2004). The political goal is to create an efficient and coherent public sector with a high quality of service, which focuses on the needs of citizens and businesses. Interoperability is seen as a key factor, and common systems, common standards and best practices are promoted as means to obtain interoperability between e-government IT systems. The guiding idea behind the project is that the responsibility for the implementation of systems and practices lies at the decentralised level, but in order to get an infrastructure where data can be recycled across the boundaries of public authorities there is also a need for central, common guidelines and solutions to general problems of legal, technical, and

¹ This is based on an earlier version of this paper (Nielsen and Newman, 2007).

organizational nature to facilitate the transition process. The infrastructure should be flexible through the use of open, well-defined, non-proprietary standards for file formats and data exchange, including descriptions of field content.

The strategy is a combination of decentralised implementation and use of vanilla systems and centrally developed best practices such as we have seen in ERP systems. In our research project we will investigate if the Danish e-government goal of efficient and coherent e-government is achieved by the planned strategy. Especially, we want to study how and to what extent the use of pre-engineered packaged software applications and reference models provide the planned efficiency, flexibility and interoperability between systems and agencies. We want to investigate if government organisations avoid the inherent clash between standardization and accommodating the uniqueness of the organisation that has been observed in the implementation of ERP systems. The study is planned to be explorative and with specific focus on the implementation of Electronic Document and Records Management (EDRM) systems. EDRM systems are an important area of the Danish e-government initiative, and an area where vanilla systems and centrally developed best practices form the basis for implementation. Because one of our premises is that process and outcomes are closely entwined, we will employ a recently developed socio-technical punctuated process model (Lyytinen and Newman, 2008) which brings together elements of history, contexts, work and project processes and outcomes and shows how these “components” interact over time to produce planned and unplanned outcomes.

This paper describes a research project in progress, and should be considered as a discussion paper. The paper presents the background and motivation for the research project, and outlines the overall research questions and the planned research design. In section two we start by summing up the experiences gained from ERP systems. Section three describes the use of vanilla systems in Danish e-government EDRM systems, followed by a section that discusses advantages and problems related to the use of standard solutions, including a status report of Danish e-government EDRM projects investigating how standard EDRM systems and standard procedures have been used in practical system design. The last section outlines research questions and describes the planned research design.

2. Disparity between vanilla systems and enterprise uniqueness

Vendors argue that standard systems and the adoption of best practices makes the configuring of the software less costly and as the best practices are built on suppliers’ or consultants’ “recipes” for conducting successful business, this brings about improvement in the organization’s processes. In contrast, Orlikowski (2002) points out that practice are situated, recurrent activities of human agents. Best practices are not fixed, static objects. They are situational and contextual, and they develop in use with a multitude of people involved in interpreting and enacting the practices (Feldman & Pentland, 2003). Gosain (2004) suggests that organisations will construct their own unique instantiation of the technology.

Organisational and individual differences may lead to different interpretations and enactments of the technology and result in local and individual adoptions of the best

practices (Wagner & Newell, 2004). Over time, people will develop various ways to “work the system” (Spinuzzi, 2003; Boudreau & Robey, 2005). In a recent study of an ERP implementation at a University (Bob-Jones *et al.*, 2008), the authors detail a wide discrepancy between the views of senior managers and the users of the system. Whereas the former were happy with the implementation which resulted in a heavily modified, centralized instantiation, the users were left as “angry orphans” (Ciborra, 1991) who developed workarounds as coping strategies. Potentially, workarounds undermine the organisation’s ability to take advantage of the system and the best practices embedded into it. Based on a case study of a Dutch SME Van Stijn & Wensley (2005) conclude that an ERP’s best practices are not necessarily “best” for the organisation”. They question the extent to which there are truly standard best practices independent of a rich variety of subtly different instantiations of each particular best practice, accommodating for their uniqueness. They question whether the organisation obtains the planned benefits of increased effectiveness and efficacy in managing the organisation or competitive advantages.

A study by Fosser *et al.* (2008) confirms the importance of systems and practices embedded in local uniqueness. Based on a review of how ERP systems link to competitive advantage, they conclude that an ERP system alone does not create a sustainable competitive advantage. ERP systems can result in competitive advantage, but it is important to have an open environment built on trust in the organisation. Ideally, the innovative organisation which sits on the top of the mechanistically, standardized ERP system should foster open communication, consensus, alignment and flexibility. It is organisational factors that can lead to creative thinking, new innovative processes and competitive advances. It is **not** the vanilla system and its standardised procedures *per se* that foster innovation and benefits, but local managerial processes.

The overall idea behind pre-engineered software packages is that they are a proficient and efficient way to implement systems and obtain the planned benefits, but as the studies about implementation of ERP packages suggest we cannot be sure that this strategy of standardised infrastructure will result in the expected profits. Standard systems imply that the organisation must adopt and make change without much attention on local characteristics and needs. The lack of consideration for local characteristics can result in ‘workarounds’ and individual adaptations of the best practices. In worst case it can end in a situation where the organisation obtains **none** of the planned benefits. The daily, internal work tasks are not supported efficiently, because the software is not set up to facilitate the particular tasks and routines of the organisation with the consequence that the employees adapt the tools and “make do”. Interoperability and external collaboration between agencies is problematic, because the required standardisation is not fully implemented due to unofficial adaptations and workarounds.

3. Vanilla software in Danish e-government document management

The key strategy of the Danish government project is one of a decentralised implementation guided by common systems, common standards and best practices as the means to obtain interoperability and flexibility between e-government IT systems. Two support units, the IT-Policy Centre in the Ministry of Science, Technology and

Innovation and the Digital Task Force in the Ministry of Finance, assist as catalysts in solving problems of coordination and cooperation in the digitalization process across the levels of the public sector. The units assist the steering committee of joint cross-government co-operations by preparing the basis and the necessary conditions for the e-government process, and develop tools and standard procedures for public employees working with digitalization in the individual institutions. The overall goal is efficiency and coherent systems that meets the needs of citizens and businesses. At the specific level the aim is to improve the productivity and efficiency of government agencies by a combination of flexibility, interoperability, and use of open, well-defined standards for file formats and data exchange.

A special unit, Fællesoffentligt Elektronisk Sags- og Dokumenthåndtering (FESD)², was established in 2002 to support the process of digital document management (Digital forvaltning, 2006). In line with the overall e-government strategy the unit has prepared a framework for system development and implementation consisting of three individual entities: a system development model, a set of technical standards, and framework agreements with three consortia of suppliers. The standard framework has been in use since January 2004. The aim is to ensure common core functionality of EDRM systems in order to manage cases and documents across government organisations and to be able to move cases between government organisations. Government institutions are recommended to use the reference models and standards developed by FESD for system development, and to choose one of the three suppliers and their software package that they have developed for implementation of document management.

The system development model has a classical structure with four basic project phrases: Analysis, development and purchase, implementation, and evaluation and operation. The FESD unit has developed guidelines for each phrase. The interoperability framework of technical standards consists of five individual standards: logical data model, method for exchanging metadata between systems, address model for contact and location information, scanning module standard, and a management information standard. Standards for subject description and development of controlled vocabularies (file plans) are under development.

4. Possibilities, pitfalls and status

At the operational level the classical goal of document management is increased efficiency and effectiveness in the daily handling of cases and documents: better overview, quicker management, quicker and more flexible retrieval, better circulation, less copying, easier control of versions, better personalization, etc. At the strategic level, important aims are enhanced transparency and knowledge sharing of practises and

² Fællesoffentligt Elektronisk Sags- og Dokumenthåndtering (FESD) stands for Common, public Electronic Case and Document management. The idea behind the project and the special unit is to develop the common framework for implementation of document and records management (EDRM) systems in the public sector. The unit cooperates with eleven government organisations that try out and gather the first experiences with the selected consortia and the developed procedures and best practices.

decisions, and increased management information (Steinmark & Zangenberg, 1998; Danziger & Andersen, 2002).

Due to the standardization framework and the framework agreements with suppliers the available EDRM software provides the same core functionality assuming a certain procedure for case and document handling. There has also been developed a standard information architecture consisting of standard metadata, standard set up of search engine, standard navigation, and standard management procedures (ScanJour, 2006; SoftwareInnovation, 2002-2004). Controlled picklists of metadata values have been developed for most metadata attributes. An exception is the metadata values used to express the topical aspect that commonly are developed and maintained by a tailored controlled vocabulary such as file plans, classification systems, thesauri, or taxonomies (Hayes, 2004; Smyth, 2005). In sum, it is in the organisation of the work processes and the development of the controlled vocabulary for subject metadata that the organisation individually can make change according to individual needs and characteristics. The other parts of the information architecture can only be redesigned by additional customisations.

Information architecture is the structural design of an information system that facilitates task completion and access to content (Rosenfeld & Morville, 2002). In EDRM systems the metadata system that consists of the metadata scheme, the controlled picklists, and the controlled vocabulary, constitute the main structure of the information architecture. Together with the search engine and the rules for document flow and management, the metadata system forms the basis for document management operations such as retrieval, work flow, personalization and rights management. The metadata system provides the structure that facilitates user interaction, enable the user to get an understanding of, and navigate around the documents and cases, and in the end complete their tasks. The system is considered as the most critical component of an EDRM system as it provides a 'knowledge map' that facilitates access to the intellectual capital of the organisation (Gilchrist & Kibby, 2000; Smyth, 2005).

Many specialist organisations such as government agencies develop their own metadata systems and vocabularies, tailored to their needs (Hayes, 2004). They consider the metadata system, and especially the controlled vocabulary, as a crucial element of effective knowledge management. Today's organisations consist of employees that come from a range of different knowledge domains, each having specific objectives and tasks in relation to the overall mission or topic, and each generating their specific discourse and vocabulary. Even related knowledge domains may look at the same topics and problems from varying perspectives, and use several vocabularies to talk about the same topic. Employees might profit from interchanged information, but because of language differences, information retrieval and sharing across knowledge domain offer far more complication than at first glance (Nielsen, 2005; Wyllie, 2005). In many organisations a common platform is needed to facilitate interoperability across knowledge domains, and in many organisations the metadata system and especially the controlled vocabulary are used as the foundation for communication and knowledge sharing (Von Krogh et al., 2000). This means that it is important that the controlled vocabularies are designed according to the needs and uniqueness of the organisation, which challenges the use of standard solutions.

The work processes constitute procedures for, e.g. how to handle and drawn up a case, create and update a document, receive and distribute e-mails, scan paper documents, and approve documents. The standard software set up determines and implies indirectly some pre-defined work flows, and it is up to the organisation to analyse the work environment and develop local working procedures in order to use as well as adapt the pre-engineered best practices to local, organizational routines. The FESD framework recommends carrying out analyses and redesigning the procedures, but the unit has not developed specific guidelines to direct the organisations.

Smyth (2005) reports lessons learned from an EDRM project at the Public Record Office of Northern Ireland. When he sums up the gained benefits, he emphasises the thorough analysis of local working procedures. Together with the redesigned classification scheme, the systematic analysis of its records management procedures provided the basis for a successful EDRM system that reflects the agency's business processes, provides a culture of sharing information, and improves the internal record management. The findings confirm that the importance of work analyses and tailored metadata systems, and they are in line with findings from the Van Stijn & Wensly (2005) case study. People have difficulties in acquiring and understanding the basic concepts underlying external standard best practice delivered by suppliers. During the implementation process the best practices will be interpreted and re-interpreted in the organisations, which opens the possibility for different or even conflicting uses in the organisation(s). Van Stijn & Wensly (2005) question to what extent the implemented practices are likely to be the same as the supplier intended. Will the best practices necessarily improve the performance of the organisation? They claim that the changes needed to take place for the successful implementation and use of ERP systems are often underestimated. The two case stories advocate increased attention to tailored solutions.

In November 2006, FESD carried out an interview survey to map experiences and status of fifteen implementation projects (FESD, 2006). The survey investigated how the government organisations as well as the three software consortia manage the process of implementing document management. The aim was to gain insight about each of the development phases and how the systems and the standard framework developed by the FESD unit are used in practical system design.

The interviews emphasize that implementation of EDRM is a demanding task for the organisation as well as the supplier. The FESD framework is useful, but it is important that the organisations know the details of the framework, know how to manage suppliers and contracts, and have a clear picture of the organisational needs and goals for document management.

In general, the organisations developed well-defined high-level goals, but in the majority of cases the organisations did not developed operational and specific goals. Only in four cases the organisation carried out analyses of business or work processes as part of the system development process. It means that most organisations take over the standard software and the best practices that are inherent in the system without any customization. It means too that the majority of organisations do not develop

formal, written best practices. As consequence, many organisations restart the whole development process in phase 3 during the implementation of the system, because they lack knowledge about organisational work processes and specific needs and characteristics. This delays the implementation, and it means that test and evaluation of systems are based on the standard requirements defined by FESD, not on company-specific requirements. In many cases the organisations take over defective systems. The report concludes that the majority of implementations are in operation, that the staff uses the systems, but so far we have no report how the systems perform or if they provide the expected benefits.

4. Research questions and future work

Summing up the findings it seems natural to put the question as to whether vanilla, standard systems and standard best practices provide the required benefits in e-government EDRM systems with regards to: a) interoperability across agencies, and b) effective, efficient and higher quality in the handling of cases and documents. Alternatively does the history of ERP systems repeat itself? The goals of ERP systems and EDRM systems are not identical. Using ERP systems the enterprise seeks efficiency as well as competitive advantage: enterprises want to distinguish themselves from the competitors. In e-government the organisations are not competing; they seek interoperability and liaison. These goals fit much better with the idea of standard systems and standard procedures that are provided by vanilla systems and common best practices, which support the idea of standard frameworks for implementation.

At the same time, the practical use cases as well as research about the essential components of EDRM systems (metadata system and best practice work processes) emphasize tailored systems and processes that build on thorough analyses and understanding of the organisation.

In the research project, we want to follow up on this dichotomy. We will study how and to what extent the use of pre-engineered, vanilla software and reference models support the two primary goals of EDRM systems: a) interoperability across agencies, and b) effective, efficient and higher quality in the organisational handling of cases and documents. As such, we have two dichotomies in play: tailor-made systems versus vanilla systems, and interoperability versus distinctiveness.

The purpose is not to develop standards or best practices, but to gain insight about the standardised implementation process, which may be valuable for undertaking future e-government ERDM projects. We want to explore how government organisations can avoid the inherent clash between standardization and accommodating the uniqueness of the organisation that has been observed in the implementation of ERP systems. From the status report we have a good reason to suspect that the same conflict is related to EDRM systems (FESD, 2006).

By use of the PSIC model, developed by Lyytinen & Newman (2008), we will study the narrative of two Danish e-government EDRM projects. We will use the model to obtain a multifaceted understanding of the development process such as project organisation and institutional arrangements, interactions between organisational context

and processes, work system activities, events and change sequences. We would also examine the role of stakeholders in the processes of developing, adopting and modifying EDRM systems (e.g. management, users, vendors, consultants, government bodies). Under what circumstances will we observe the deployment of standardized systems vs. customised systems and various user-coping strategies such as workarounds?

It is said in the FESD (2006) status report that systems are often implemented by a big-bang approach due to delays. Findings from the interview survey suggest that it might be better to divide the process into smaller, more manageable sub-projects. By analysing the interplay between technologies, actors, organisational relationships and tasks, antecedent conditions as well as outcomes, we hope to get a better understanding of the sub processes and pitfalls in the implementation process and the possibilities in system design.

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