Legal Requirements and Modelling of Processes in e-Government

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Abstract: In most cases, it is not possible to transfer e-Business solutions and development approaches directly to the public administration. This is partly due to the legal framework that governs public administration. Therefore, the introduction of e-Government has been much slower than one would expect based on existing technology. This paper shows the importance of including the legal framework in modeling efforts for e-Government and how to accomplish this task. The approach is demonstrated using the example of the German Federal Insurance Institute for Salaried Employees, the "Bundesversicherungs-anstalt für Angestellte".

Keywords: e-Government, public process modeling, administrative workflows, legal constraints

1. Status quo of e-Government

Companies that successfully introduced e-Business in the recent years were those which focused more on "Business" rather than "E". These companies formulated a clear and straight business strategy and transported that strategy to the information age. Other companies which focused more on the "E" and forgot about the value added for their customers or suppliers did usually not receive much return on their investments into modern information and communication technology (ICT).

The modernization of the public administration obeys similar rules. e-Government cannot be achieved by just implementing available software. A careful analysis has to be conducted as to how ICT can improve government processes, i.e., make them more efficient and more effective. In e-Government efficiency and effectiveness are defined very widely: they concern both the government agencies as service suppliers and citizens and enterprises as service users [Becker et al 2004]. Only if both parties benefit from the computerized procedures, in a monetary or in any other way, can e-Government be considered as efficient or effective. In addition, successful e-Government can be seen as an additional advantage in the global competition of regions for local investments [Accenture 2004]. For example, it is possible to submit individual tax returns to the German revenue services via Internet (a signed short paper form still has to be sent by regular mail). However, there is currently no guarantee that the forms will be processed quicker than otherwise and the reply, the tax assessment, is sent by regular mail. While the revenue service can process the electronic submission more efficiently than the paper form, there is little incentive for tax payers to submit electronically. Therefore, the service is used by only few tax payers.

The fast development of ICT and the benefits realized in the private sector from its use put pressure on the public authorities. e-Government seems to be the perfect answer to the demand for better and more efficient services in times of tight public budgets. But the ongoing debates, in research and in public, show that introducing e-Government systems is not that easy. Many of the technologies and techniques that are successfully used in the private sector can not be transferred one-to-one to the public institutions. According to a recent survey of top executives in German public institutions, the major barriers are the lack of internal know-how, legal restrictions, and the missing documentation of public processes [Scheer et al 2003]. In other words, there is a need to analyze public processes on an abstract level. The method we present in this paper tries to solve these problems by integrating the legal constraints into the modeling approach of event process chains.

Certainly, other obstacles to successful e-Government exist and further differences between e-Government and e-Commerce can be found. In any case, there is a need for careful analysis of public processes in order to improve them. Legal constraints on public processes must be respected. To show the impact of these legal constraints, this paper focuses public service provision. Concerning public service provision, we can assume that a more efficient workflow is desirable and creates a measurable financial benefit for both sides. Nevertheless, our method is not limited to service provision processes.

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The maturity of e-Government can be measured by the level of possible interaction with the authorities [Mehlich 2002]: the first level is the information level at which the institutions simply offer information online (e.g., opening times, fees, or requirements to apply for a service). At the communication level bilateral communication with public institutions is possible (e.g., form requests and inquiries by e-mail). At the highest level, the transaction level, services can be obtained online completely. Today, most of the online services offered by European government agencies are at the first and second level of interaction.

Reaching the first and second interaction level was not that difficult since the technology (e.g., web sites providing information) could be added without changing any of the administrative processes. The use of new ICT did not lead to improved processes [Scheer et al 2003]. Thus, most e-Government efforts are currently stuck at the communication level, as figure 1 illustrates. To reach the transaction level, it is often necessary to change the daily workflow within an institution. Hence, one has to take a closer look at the organization, the processes which it carries out, and how to optimize these processes for e-Government.

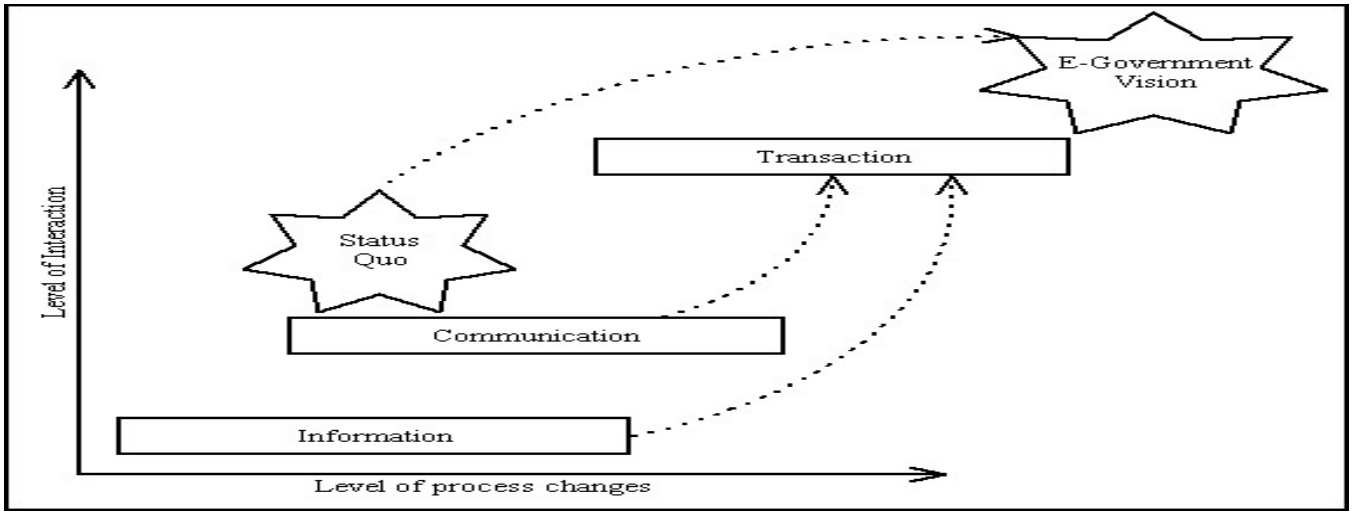

Figure 1: Maturity level of e-Government projects

In commercial services, it is often the service provider who first approaches the potential customer via some form of communication. With government services, the process is usually initiated by its potential user, i.e. a citizen, an enterprise, or another public institution. Delivering government services online requires, therefore, good online information and communication capabilities as a first step. The implementation of these services and interfaces was the focus of recent efforts. Another goal of these efforts was to offer the services around customer needs [Schneider and Crook 2002] rather than following the organizational structure of government agencies. Thus, most of the recently created web portals offering online public services are structured around certain private or business life situations (e.g., www.ukonline.uk, www.ch.ch, www.service-public.fr). As a consequence, the public institutions, which used to be the center of interest in Max Weber's bureaucracy model [Weber 1922], are losing their importance [Snellen and Zuurmond 1997]. For instance, a marriage requires many (independent) services to be executed by the administration like changing names, addresses, legal and tax status, etc. If all these services are offered together through a web portal, it becomes irrelevant for the user which different institutions are executing these processes. Managing this organizational change will be a challenging task in the future [Hauschild 2002].

The next section discusses the current problems of modeling government processes and derives requirements for a method that can support this task. Section three applies the proposed modeling framework to the German Federal Insurance Institute for Salaried Employees, the "Bundesversicherungsanstalt für Angestellte" (BfA). Section four summarizes the results and gives an outlook about the use of our method.

2. Modelling of government processes

2.1 Problems in modelling public workflows

Modifying its internal workflows towards the customers' needs is a development the industrial sector has already gone through in the recent years. Well known results of customer service

orientation are the installation of call-centers, service pages, and the increasing attention to quality management. Theoretically, the government could easily adopt these measures. But, the change in the internal processes will not be as easy since the state cannot exclusively focus on the customers' needs and benefits. The public authority's internal workflow is governed by a legal framework. Furthermore, there are hundreds of decrees for almost each administrative process. These decrees rarely contain any instruction about the output of the administrative process but they mainly regulate how to create a certain output. As a result, following aspects have to be taken into account when modeling government processes [Wimmer and Traunmuller 2003]:

- Organizational and technical perspectives are hard to synchronize within a project since small changes on the one perspective may require huge efforts on the other.
- Internal and external views on the workflows differ considerably. Public online services offered in portal solution should use a customer oriented workflow; a perspective the state has little experience in. Thus, current laws do rarely support efficient and effective workflows.
- e-Government modeling methods have to respect the characteristics of public services. While most of the existing modeling methods were developed in order to optimize supply chains or production, there are no such clear goals in modeling public workflows.
- Political and strategic perspectives have to be synchronized. Political influence and its dependency on election terms have to be understood and need to be well separated from the long term strategic perspective of modernizing the state's processes.

Each of these aspects has to be analyzed individually for every country on a more detailed level, and many of them currently are. We concentrate on the legal perspective which concerns most of the aspects mentioned above. Laws and decrees are often the major barrier to re-engineering public workflows [Lenk et al 2002]. As mentioned before, common modeling methods do not show the impacts of the legal framework. Re-engineering the public workflows for e-Government without a model which respects the legal constraints is rather dangerous. It may lead to systems that are not useable either because their use would lead to breaking laws or because their strict following of laws makes their use so inefficient that they do not represent any improvement to the former state.

2.2 Requirements for an e-Government process model

To reach the transaction level, each step of an administrative process has to be carefully analyzed and, if necessary, modified. Suitable methods and modeling tools are needed for that purpose. Unfortunately, most modeling tools on the market do not support the modeling of public processes. This may be one of the reasons why a systematic approach to the modernization of public services has not been conducted in many e-Government projects which have been realized so far [Lenk and Traunmuller 1999]. Another reason for neglecting process modeling is the fact that, as discussed above, so far the main goal has been to offer information and communication online. This might have been a good start but will not be enough to fulfill the high expectations in e-Government. To provide services on the transaction level, it is crucial to remodel public processes towards e-Government.

A number of methods exist for the modeling of business processes. Some of these methods are used to represent the processes embedded in major enterprise resource planning software (e.g. SAP R/3) or to guide the customization process during the implementation of such software. In principle, these methods can be used to model government processes as well [Becker et al 2003]. However, government processes are usually more regulated than business processes; private actors have more freedom in defining their terms of trade and in their agreements in general. Hence, there are further requirements for suitable modeling methods for e-Government [Wimmer and Truanmuller 2003]:

- Process models should contain the relevant subjects, objects, activities, events and constraints of administrative processes that make up a transaction.
- The process models should make it transparent where degrees of freedom for individual decision makers exist.
- e-Government processes should be standardized in such a way that they can be synchronized and put together with other such processes to form a one-stop solution for their end users.
- The resulting models should be able to show the restrictions for re-engineering that are set by the legal framework or other public regulations.
- The method itself must not be too complex since administrative executives are usually not familiar with modeling languages.

An integrated process model should make it easy to identify possible ways for improvement. To be

easy to understand and hence accepted by the authorities, highly formal modeling languages like Petri Nets or the Unified Modeling Language do not seem suitable for e-Government [TSKM04]. The modeling approach should be independent of the primary purposes (e.g. customers needs, higher efficiency, cost reduction, etc.) of the re-engineering efforts.

2.3 Event-driven process chains and their extension

Most of the European countries already have modified their civil laws in order to equalize online and offline transactions. The legal framework on the digital signature and its use is even harmonized in the European Union (EU guideline 1999/97/EG on electronic business procedures). However, detailed process analyses did usually not take place before enacting the specific laws. We suggest extending the given business process modeling methods by adding "pointers" to the relevant laws and decrees. In respect to the requirements derived in section 2.2 and 2.3 we choose event-driven process chains (EPC) as the basic method.

The method of EPC was developed in the early nineties by Scheer and his coworkers [Scheer 1997]. EPC describe processes as sequences of activities in a semiformal graphical form. They are used to define, document, and control workflows in business process re-engineering as well as in software development and the configuration of standard software [Loos and Allweyer 1998]. Because of their inclusion in the ARIS-Toolset and the SAP R/3-Analyser, the method is widely spread, especially in Germany. Figure 2 shows the basic elements of EPC in general and symbols for the documentation of legal constraints that we added.

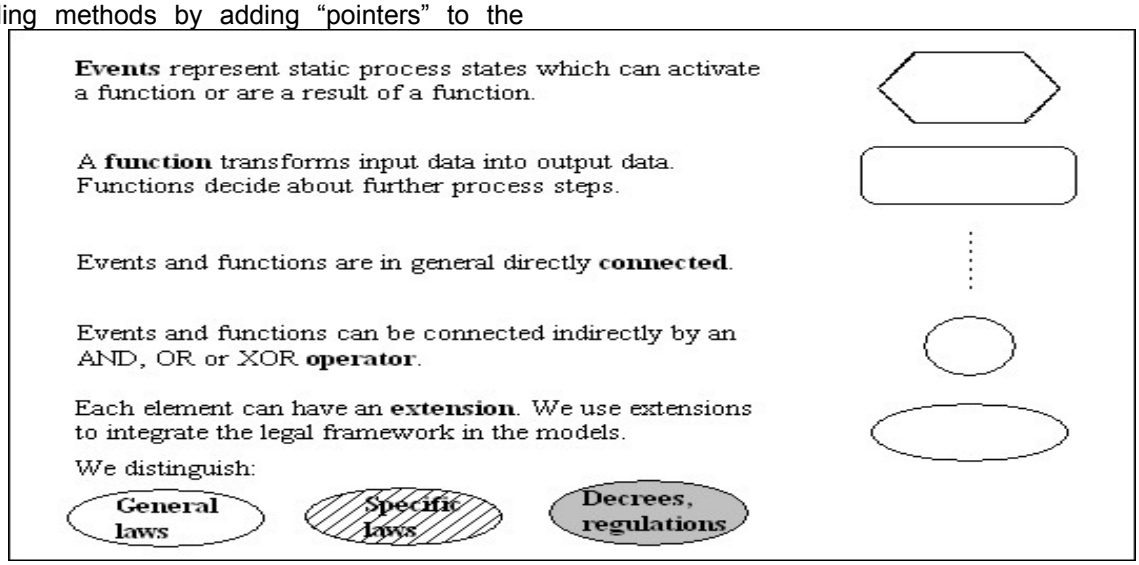

Figure 2: Elements in event-driven process chains and extensions for legal aspects

To show the usability of our method we model processes at the German Federal Insurance Institute for Salaried Employees, the "Bundesversicherungsanstalt für Angestellte" (BfA) as a demonstration example.

3. Processes at the German federal insurance institute for salaried employees

3.1 The German federal insurance institute for salaried employees (BfA)

With its more than 115 Billion Euro annual budget, the BfA manages Germany's second biggest public budget and one of the biggest in Europe. Per annum, roughly 750,000 applications for pension and more than 700,000 requests for rehabilitation measures arrive at the BfA while corresponding replies leave the BfA. That makes the BfA one of the key-players in the modernization of German public services and a potential role model for other public institutions [BundOnline 2005].

The standard process of a transaction with a public institution, including the BfA, can be roughly split into four steps [Menne-Haritz 2001]: the application, the internal public workflow, the transmitted answer, and the filing of corresponding records. Transactions can be classified as transactions that contain media breaks, transactions that do not contain media breaks but require human involvement (we shall call them electronic transactions), and totally automatic transactions [Becker et al 2003]. If a transaction contains a media break, manual work is needed to transfer a form into a different

medium. Of course the process itself can be (and it mostly is) supported by ICT. For example, the BfA provides application forms on its web site but the forms cannot be electronically submitted. They have to be printed, filled out, and signed manually. Afterwards, the forms are sent to the BfA by regular mail where they are typed or scanned into the electronic system. An electronic transaction (without any media breaks) is characterized by individual decisions like: assessing the legality of an application, postponing deadlines, approvals or rejections, etc. If no individual judgments are needed, an electronic transaction can be fully automated and becomes an automatic transaction. These are usually simple information processes like the calculation of future retirement payments based on the existing records and certain parameters. Automatic transactions occur seldom because they do not leave any space for individual assessments of a case. However, they are the most efficient emergence of e-Government and should be implemented where possible.

3.2 Applications at the BfA

All three types of transactions are in use at the BfA. Even automatic transactions have been well known before the idea of restructuring towards e-Government [Grunert 2002]. However, many of the processes still contain media breaks. In the application process the media break basically exists because the digital forms are only provided on the BfA's webpage (www.bfa.de), but cannot be sent electronically. Meanwhile, they can be submitted with an electronic signature but very few Germans possess the necessary hardware (chip card and reader) to use qualified signatures. However, the requirement of a written and signed application is by no means "natural" since the German code of social law (Sozialgesetzbuch, SGB) knows no specific regulations on how to send an application to the public institutions.

The need for digital signatures in Germany's social security system is derived from the recently modified civil law (§ 126 BGB) that follows the European guideline for electronic business. As the guideline demands, the new § 126 IV BGB puts the electronic text on the same legal level as the printed one. To prove the authenticity of the data, the electronic signature (§ 1 SigG) is needed. All institutions, public or not, have to obey the civil law. Thus, electronic documents and forms have to be digitally signed to prove their authenticity. Since a change of the internal workflow has not taken place yet, most of Germany's public institutions have created their own electronic post offices in order to validate digital signatures. After the validation, the form is reinserted into the common workflow. Figure 3 shows an interesting development: instead of simplifying the process compared to the paper based one (a), the electronic communication has even extended the process chain (b).

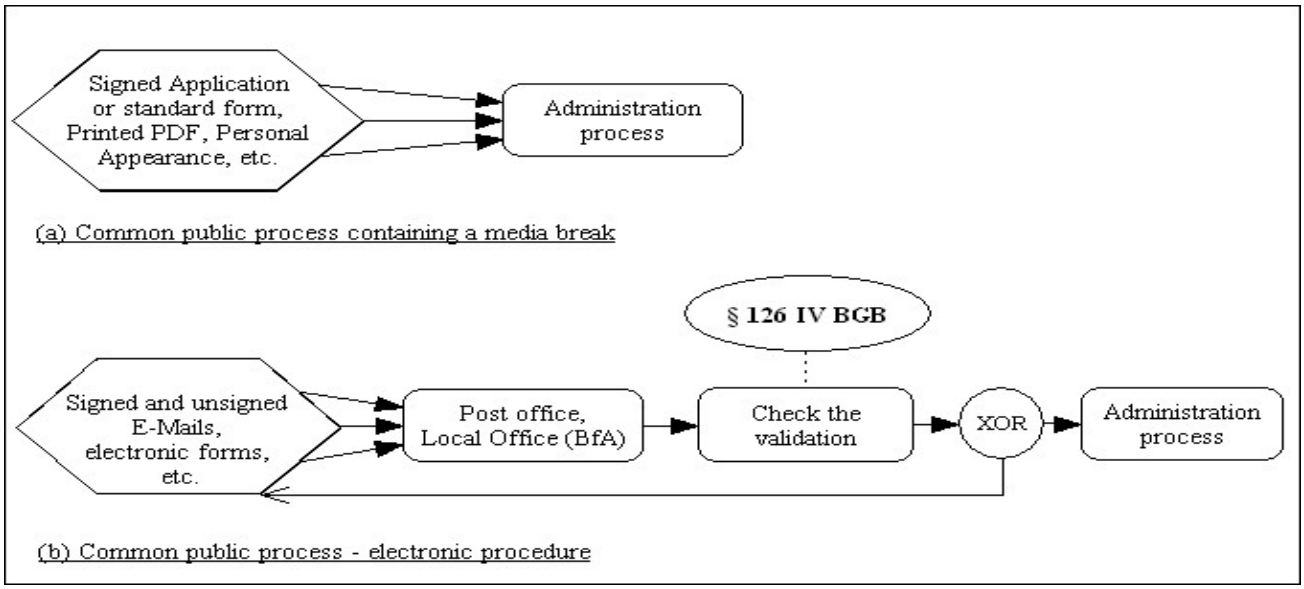

Figure 3: Application process with a media break and without it

Although the process chain has been extended by the post office, the public authorities are now able to electronically support the complete application process. Due to its many local offices all over Germany, the BfA does not even need a central post office since most of the data are typed at the local offices. Consequently, the local offices are responsible for removing the media breaks [Grunert 2002b]. Before the passing of the new laws, the application process always contained a

media break. It is now the number of clients using the new way of application that will determine if the extension of the process will pay off. While the German government is very optimistic in calculating the number of future online users [BundOnline 2005] others have a more skeptical point of view [Gongolsky 2002]. Only a small number of electronic documents might reach the BfA in the next years since the use of a digital signature is still quite an unfamiliar procedure in Germany. Nevertheless, the BfA is well prepared to handle online applications.

3.3 Response creation at the BfA

The creation of new laws (e.g., SigG) and modification of existing laws (i.e., BGB, SGB, etc.) to allow electronic interactions are emphasized in the strategic papers on the modernization of the public administration [BundOnline 2005, Posch 2003]. One of the most recent efforts in Germany in this direction is the "3. Verwaltungsverfahrensänderungsgesetz" (VwVfÄndG). The law, enacted in February of 2003, has modified several administrative laws and decrees towards electronic workflow. Its main purpose is to treat electronic administrative procedures equally to the non-electronic ones (§ 33 II SGB-X). The only restriction is that all electronically created communiqués have to be digitally signed (§ 36a SGB). Before the 3. VwVfÄndG was passed, the BfA was able to create about half of its replies (e.g., notifications, retirement payments, etc.) automatically without any personal identification and human interference in compliance with § 33 IV SGB-X. Suddenly, an electronic signature has been required on all these automatically created communiqués. Figure 4 illustrates that law making without careful prior process analysis did make such transactions less efficient.

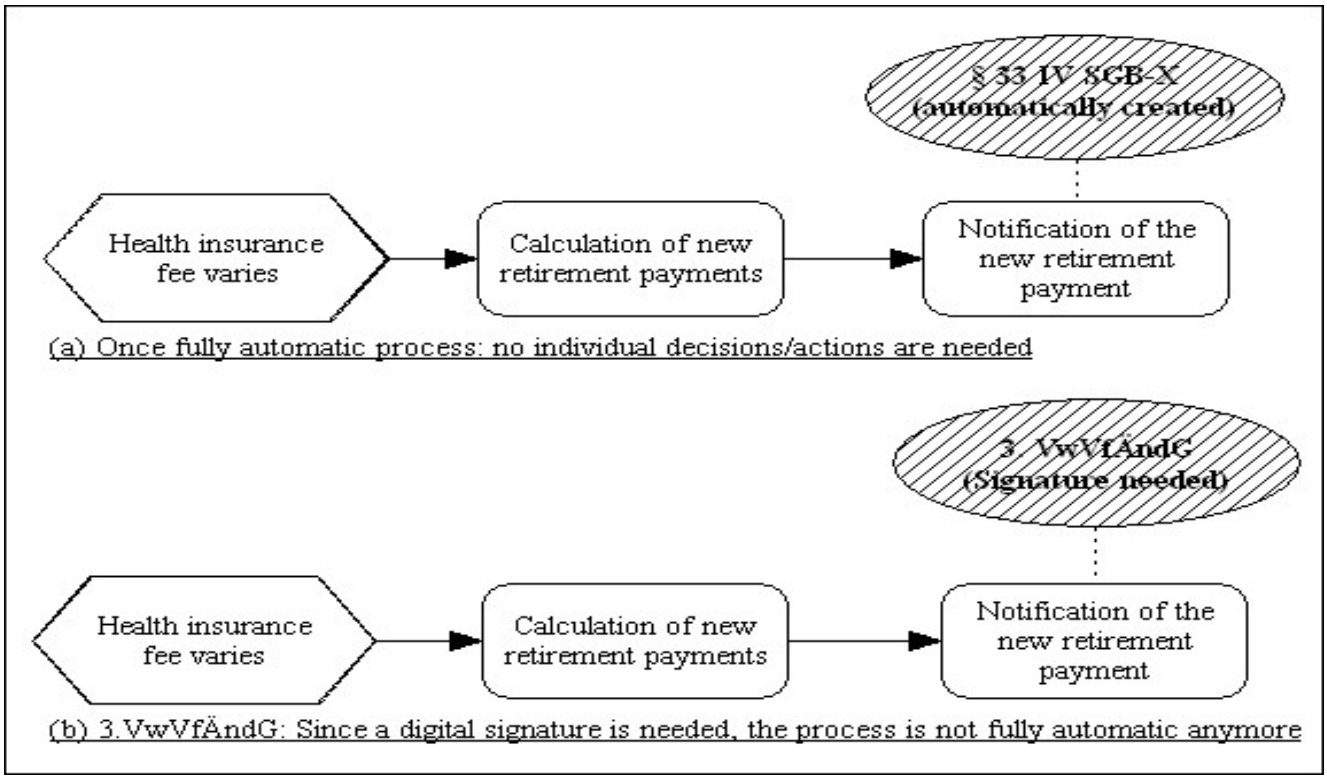

Figure 4: Negative impact of the change in the legal framework

It is obvious, that an electronic procedure does not necessarily enhance the workflow. Such important implications can only be seen by modeling the processes with explicit consideration of the relevant laws. Public processes can rarely be as drastically restructured as they can be in private organizations [Scheer 1998, Alpar 2000]. What is needed is a careful analysis that clearly reveals the implications of legal requirements on processes. Given the original 3. VwVfÄndG, each of the BfA's automatic communiqués would have to be signed digitally by a civil servant. To prevent this unwelcome development the § 33 V SGB-X was changed again. The law now permits the use of automatically created signatures that only identify the institution (§ 2 II SigG) but not the civil servant as an individual signature would do (§ 2 III SigG). In this special case, we are now – after two law modifications and several process changes - at the same point from where all the e-Government efforts started. As we proofed, having used a suitable process modeling tool, this

development could have been predicted and prevented in an early stage of law making.

3.4 Response communication and archiving at the BfA

So far, we took a brief look at the first two steps of the BfA's process chain: the application and the answer creation. To describe the whole process chain, the last two aspects are still missing in the analysis: the communication of the administrative decision and the archiving of the process as a legal file. Whether the communication of the output can be digitalized depends more on the BfA's clients than on the BfA itself. § 36a SGB-I permits the BfA to send digital communiqués as long as the citizen is able to receive them and validate the signature if desired. This form of communication occurs in practice very seldom. It will probably still take a long time, until the more than 30 million Germans insured at the BfA will have their own chip card to sign digitally and the ability to validate signed forms. Neither the BfA nor any other public institution in Germany intends to equip the citizens with such a chip card and reader. They rely on private institutions like banks, private insurance companies, etc. to do so in the near future [Grunert 2002a]. Till then, the step of communicating the administrative decision will cause a media break. Yet there is hope that the next health insurance card to be issued by the health insurance companies throughout Europe in the near future will contain a suitable chip for electronic signatures [DIMDI 2004].

The step of digitally archiving the process depends on the authorities themselves. Before a public document can be archived it needs to be "witnessed" first. Concerning electronic documents, witnessing means that the file is connected with a digital signature (§ 30a SGB-X) and archiving means storing the file on a sustainable medium (§ 110d SGB-IV). On top of that, one has to respect certain decrees in each process step. The first of these decrees, modified towards online processing, refers to the accounting standards in the German social assurance, the "Verordnung über das Rechnungswesen in der Sozialversicherung" (SVRV). The modified SVRV was enacted in 1997 and it permits to replace the physical signature of the auditor by his electronic one. Taking all these rules together, the BfA is able to electronically store its accounting files. Figure 5 compares this procedure (5b) with the old process (5a).

Due to our method of integrating the legal framework in a standard modeling tool, we are now able to improve the workflow further towards e-Government. It appears that an electronic signature is needed when a decision is made and once again when the process is being filed, even if the person executing the tasks is the same. To avoid such duplication of work, we suggest a slight modification of the internal regulation of the SVRV, the "Verwaltungsvorschrift über das Rechnungswesen in der Sozialversicherung" (SVRwV). The modification should permit that already signed accounting files do not necessarily need to be signed again when archived. Alternatively, they could receive an institutional signature like communiqués [see section 3.2] now do. As the process chain in figure 5c shows, this could lead to a fully automatic archiving process. Changing the SVRwV should be possible in the short run, since it is an internal regulation. Changing § 30a SGB that concerns non-accounting files is possible as well in order to enhance the process, but this will certainly take some more time and further considerations since it is a general clause in the code of German social law.

In our example, the modifications of the legal constraints as well as of the workflow are relatively easy to achieve, since they only refer to an internal regulation and changes in the electronic system respectively. Thus, these modifications indeed simplify the process in a way that a fully automatic process can be generated. To (re-)model complex processes, we suggest categorizing the legal constraints by the time necessary to change them [see figure 2]. We distinguish three categories of legal constraints: first, there are certain regulations and decrees (ministerial guidelines, etc.) which only affect the internal workflow and which can be changed in the short term; mostly even by the organizations themselves. Second, there are certain decrees and special laws that contain rules for the institutions in general (tax guidelines, social law, etc.). Although they only affect certain branches of the public administration, theses laws and decrees have to be approved by both chambers of the German legislature (§ 108 GG). Hence, they can only be changed in the medium term and only with the political support and will of a required majority. Finally, we have the legal framework which all institutions obey (public and civil law). Since these laws depend on lengthy political and social debates where all aspects have to be evaluated, they can only be changed or modified in the long run.

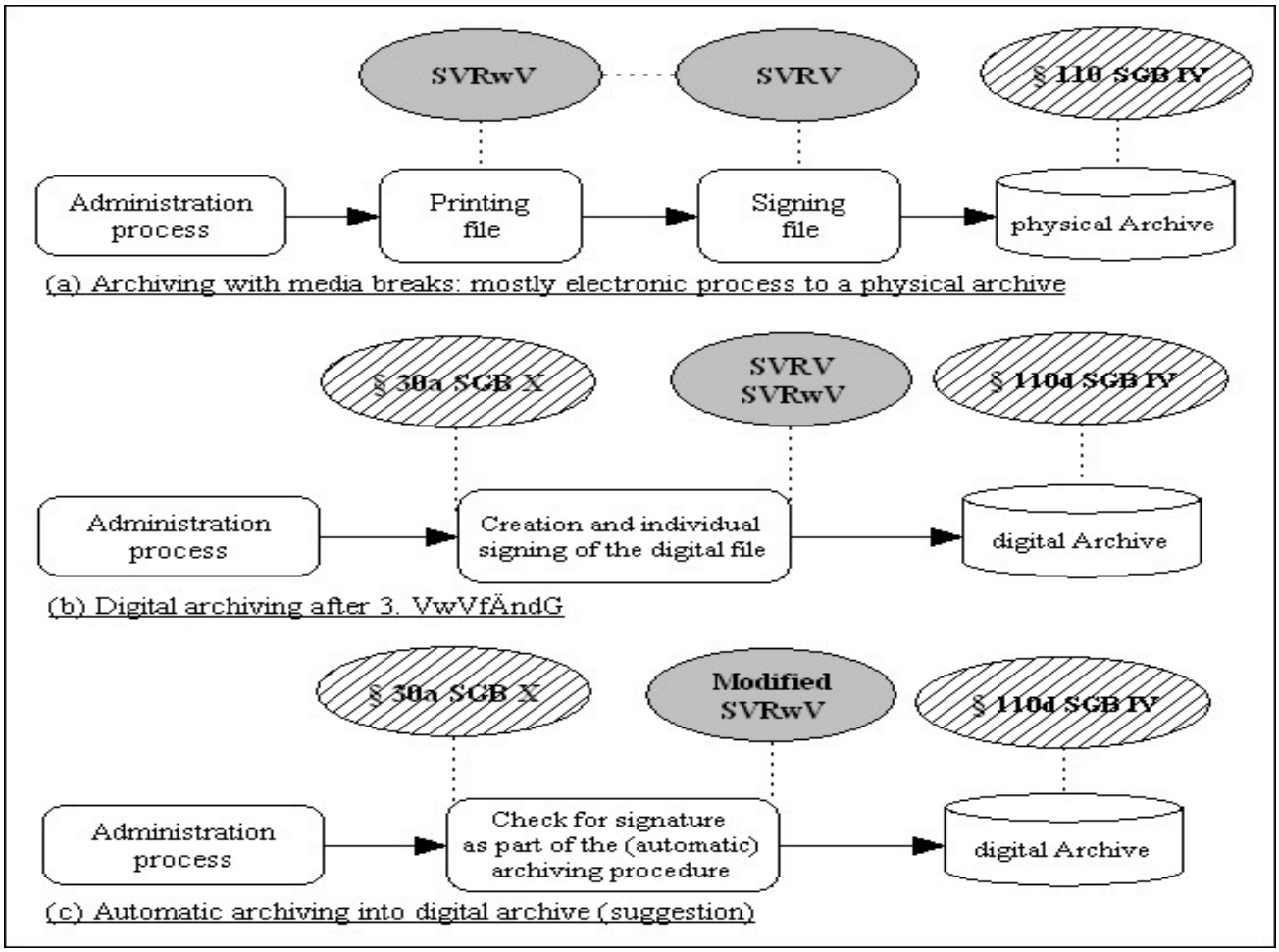

Figure 5: Improvement of the archiving process

4. Concluding remarks and outlook

Proponents of e-Government have the vision of a renaissance of New Public Management [Schedler and Proller 2000], better public offers for the individuals [eEurope 2004], or even the enhancement of the democratic political system and democracy itself [Jansen and Priddat 2001]. As a way to achieve that, adding ICT is often recommended [Booz 2002]. Consequently, technical issues like digital voting, one-stop web portals and secure interactions are in the center of attention. There is no doubt about the importance of each of these aspects, but e-Government is more than just a technical problem or a single challenge.

e-Government services are about to reach the level of transactions. Since the legal framework is often seen as one of the most significant barriers to a change towards online processing, we augment a process modeling method to include information on legal regulations that govern the observed processes. This information will help to decide whether a process can be simply improved at the clerical level or whether changes in internal regulations or even state laws are necessary. But before changing laws and decrees, the affected workflows should be documented and analyzed with appropriate methods.

At the organizational level, our method can be used to support two aspects of management decision making in public institutions. First, since the type of regulation (general law, special law, or decree) significantly determines the speed at which processes can be changed, a proper documentation represents a road map towards partial or full system support of these processes and their “E-enablement.” Second, our approach can support the choice of the necessary management technique to change the processes. Some administrative workflows will need to be restructured completely following the Business Process Reengineering (BPR) [Hammer and Champy 1996] approach to enable electronic processing. Permanent changes, as described in the method of Continuous Process Improvement (CPI) [Scholz 1996], are the adequate measure for other public processes. We believe that our method can support these organizational decisions and help to (re-)evaluate current e-

Government efforts. Based on a comprehensive model, it can be deducted which measures need to be undertaken to elevate the public services to the desired level of interaction (information, communication, or transaction). Once measures are determined that are needed to change a public process (whether organizational or legislative) the required effort can be put in relation to the expected benefits of the new workflow (reduction of cost or enhancement of efficiency or effectiveness). This can help to prioritize e-Government projects appropriately.

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