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The Impact of Electronic Subways on Government Decision-Making Processes

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1. Introduction

Traditionally government decision-making has been a paper-based business with policies prepared on paper, replies to letters drafted on paper and internal memos sent on paper (etc). The introduction of e mail has meant that some traditional paper-based communication can now be done electronically. Even so, the bulk of the information flow remains paper based. With the rise of information and communication technology (ICT) the handling of paper documents through (government) organizations may seem obsolete. However, the changeover from traditional paper documents to their electronic equivalents is not without problems and involves a major change for an organization.

On a technical level, the introduction of electronic document routing systems means the introduction of new ways of dealing with documents. For instance, it becomes possible to route documents requiring signing in parallel, whereas it has previously only been possible to route such documents sequentially. Another possibility is the availability of documents through Intra and Internets. These new possibilities have a stronger impact on an organization than might at first be imagined. At an organizational level, issues such as, accountability, validity, observing hierarchical relations (etc) are important. Consequently, the introduction of an electronic document flow requires the redesign of the business processes of the organization under consideration. Legal issues are involved as well. What are the legal requirements concerning accountability and validity? Are there any problems with keeping electronic documents in archives?

This chapter reports on research carried out for a Dutch government ministry that considers the introduction of an internal electronic document system. Some technical and legal aspects and the consequences of the introduction of such a system for the organization are addressed. Our findings are based on, an analysis of the functional specifications of three demo-systems that were set up in a closed testing environment, interviews with the people responsible for the introduction of the system, and with the future users of the system. To assess legal issues a literature study was conducted. Section 2 outlines existing paper-based document handling at the ministry. Sections 3, 4 and 5 deal with three different categories of problems that may accompany the introduction of an electronic system for handling document handling. Section 3 addresses organizational problems, section 4 logistical problems, and section 5 legal problems. Technical problems are not addressed separately as they fall outside the scope of this paper. In section 6 some conclusions are drawn.

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2. Document Handling

Before exploring the legal and organizational consequences of the introduction of an electronic document-handling system the existing paper-based situation must be described. Within the government ministry that formed the object of our studies three official document types are distinguishable: notes, minutes and memos. A note is a formal document used to prepare policy decisions. A minute is a formal document employed to outline outgoing letters. Memos provide the means for informal internal communication. In addition to these internal documents many types of external documents exist, including; reports and (incoming) letters (etc).

Internal documents are routed according to certain procedures. These procedures reflect the different fields of competence and the hierarchy of the ministry. Formal documents follow the procedure as described below. The process begins with an internal or external cause (for instance, if the development of a policy is required or a reaction to a letter drafted) necessitates the preparation of a document. Such tasks are alloted to civil servants. At the lowest level, documents are dealt with informally, for example, concepts are discussed with colleagues. Once a concept of a document has been prepared the document goes to the next level in the departmental hierarchy. At this level the document is considered by the department head. After the department head has approved and initialed the document it is sent to the other departments concerned (at the same level in the hierarchy). In the organization of the ministry different department heads are bestowed with the authority to check and approve formal documents on certain aspects on behalf of the minister. If a proposal has, for instance, financial consequences, the department of finance must be consulted. Once the initials of the different department heads have been collected the document is forwarded to the next level in the hierarchy. At this level the document is evaluated by one or more directorates. Once the Director-General(s) has (have) initialed the document it presented to the Secretary-General and, if required, the Minister. The document and its amendments are then returned to the department from which the document originated and a final version of the document is prepared for signing. Of course, disagreement about the contents of the document can result in iterative steps during the preparatory process. If there is disagreement as to the content of a (concept) document, comments made at higher levels in the hierarchy take precedence over comments made at lower levels.

Document handling forms a complex system. The way in which documents are routed clearly reflects the competencies of the different departments and the hierarchical structure of the organization. The means used to transport the physical documents further adds to the complexity and keeping track of documents circulating through an organization is no mean feat. This task is undertaken by 'information units' integrated within departments. Documents are registered with a unit and consecutively transported to another unit (department). Once a document reaches a new department it is registered with the information unit at that department. Since this is a time-consuming procedure documents are often circulated informally among departments. This practice increases the risk of documents getting lost. Other problems with paper-based document handling include; the registration of documents, physically keeping track of documents, and checking on the status of documents (some documents must be dealt with within certain time-frames).

3. Organizational Consequences

An electronic document-handling system could be of help in reducing some of the problems mentioned here. Registration can be done quickly by the civil servant who has drafted the document. The routing of documents can easily and quickly take place by e-mail or a similar electronic distribution system. Moreover, whereas paper documents can only be routed

sequentially, electronic documents can be routed in parallel - this can result in a substantial time saving. Status checks (progress made, overrunning of terms) can be built into the system. However, these seemingly easy solutions are not without problems themselves. The problems with electronic document systems can be divided into three categories: organizational, logistical and legal. In this section we address the organizational problems. Logistical problems are discussed in more detail in section 4 and the legal problems in section 5.

Introducing an electronic-document system has serious consequences at several levels in an organization. It is obvious that some of the tasks performed by information units become superfluous, for example, documents no longer have to be registered and transported by the information units. This change results in a re-allocation of means from the information units to the automation department. Perhaps less obvious are the organizational problems accompanying the routing electronic documents. First, the sequence in which documents are routed becomes less fixed. Documents can for instance be sent to other departments, at the same or at a higher level in the hierarchy without knowledge of the department head. Which therefore challenges the formal hierarchy of the traditional civil service. Second, routing documents in parallel can create problems with the sequence in which comments are made. If a physical paper document is used comments are made in sequence. Thus, each new commenter can see the comments made previously. An official at a lower level in the hierarchy will probably adapt his comments to the comments made by his superiors or by officials with a specific competence in that area. When documents are routed electronically, these natural way of observing the relations within an organization are lost. This may lead to conflicts due to departments' feeling that their competence is affected.

4. Logistical Problems

The logistics of electronic document systems are not without problems either. First, it is probably not possible to switch entirely to an electronic system. Incoming letters and large reports (etc) remain in paper form (in the next section we address the legal problems that converting these documents to electronic versions would cause). Consequently, two parallel circuits, an electronic and a paper-based circuit emerge. Secondly, a flexible system for routing documents must be available. It must for instance be possible to mark documents as urgent. Third, procedures must be established for authorization and authentication. The number of persons that can actually change an original document must be limited, in most cases it suffices if a person can comment on a document or can suggest amendments. Fourth, an electronic document system requires a version management system. It must only be possible to register each documents once and it must always be clear which version of a document is the most recent (etc). Moreover, it is important to register the person who has commented on or amended a document, his position within the organization and the time at which he has made his amendments (etc). Also, a system must be provided to give other people access to previously made comments. Fifth, storing electronic documents requires different facilities and procedures than storing paper documents. This host of potential problems must be addressed in the development of an electronic document-handling system. As a consequence, the resulting system will be technically complex. Since the availability of the system is essential to the activities of the organization the system must be well-tested before its introduction. In addition to organizational and logistical problems, several legal problems further complicate the matter.

5. Legal Problems

The legal problems surrounding the introduction of an electronic document system can be divided into four categories:

- authenticity and legality,
- storing and archiving of documents,
- authorization and security, and
- privacy.

Each of the four categories are discussed in turn. The focus is Dutch law.

5.1 *Authenticity and Legality*

With paper-based document handling the format of documents (a standard document model can be used for documents of a certain type, such as, notes or minutes) and the signing or initialing of documents installs those documents with a certain status. Such official status plays a role in establishing the legal consequences a document. In the setting of document handling within a government ministry, an initial, for instance, expresses the agreement of the signatory with the content of a document. The signatory thus expresses a degree of commitment to a certain policy proposal or to the contents of an outgoing letter. Once paper documents are replaced with electronic documents, questions may arise as to the authenticity and legality of documents. Are the legal demands regarding mandatory requirements of form met? Can an electronic document have a status as an authentic document? What is the status of an electronic initial or signature? The answers to these questions have serious repercussions on the feasibility of electronic document handling, especially where the admissibility of electronic documents as evidence is at stake. In principle electronic documents and records are admissible as evidence, provided there are no specific requirements of form, such as the use of a notarial deed (in the Netherlands and in most other countries). The problem lies in (proving) the authenticity and integrity of the documents, records, initials or signatures. Whereas a conventional paper document unites a message and its record in a single, durable medium, electronic message identification has to deal with two enquiries as to the authenticity and integrity of the message: what is the genuine message? and, is this an authentic record of that message? Since the proponent must prove that a record is authentic, he has to deal with both questions.

The requirements regarding authenticity (etc) are primarily of importance when documents are used in external legal procedures. When addressing the requirements in the context of an *internal* document-handling system, most of the problems are less relevant. The function of many documents, such as notes, minutes and memo's is 'internal'. They are used in the preparatory phase of a final report or an outgoing letter. Since the final result, for instance a reaction to a letter, will be in paper form and will be signed traditionally (i.e., not electronically) the issues to be addressed when dealing with electronic documents do not apply to the end products of the electronic preparatory phase. However, even though an internal electronic document system does not create specific legal problems as to the authenticity and legality of documents, an electronic system may have internal consequences, for instance in the area of labour law. What if an official oversteps his authorization? What are the consequences of non-observance of internal procedures? With these 'internal legal problems' in mind, we deem that an electronic document-handling system must have some facilities for guaranteeing authenticity. It must, for instance, be possible to keep track of different versions of documents. It is important to be able to keep track of the latest version of a document and to be able to reconstruct amendments to previous versions. Moreover, it must not be possible to introduce duplicates of

documents into the system. Consequently, an electronic system must implement authorization procedures. Only certain individuals should be authorized to actually change a document, whereas others should only be authorized to comment on the document. Such a system could, for instance, be implemented in a network environment through the introduction of password-protected accounts.

5.2 Storing and Archiving of Documents

More pressing legal issues come to light when dealing with the storing and archiving of documents in electronic format. The issues flow from the function of public archives. Whereas the storing and archiving of data in the private sector has a mainly evidentiary purpose, in the public sector storing and archiving of data is also done with an eye to the justification of government actions, the preserving of the cultural heritage and the making available of data for historical research. These differences in function and purpose of private and public archives have, in the Netherlands, resulted in different legal regimes. More specifically, the demands posed on public archives are much more stringent than those for private institutions. For instance, if a document is stored in the archive of a private company or institution the document has to be kept for a maximum of ten years (in many cases the term is only five years). For archives of public institutions the term depends on the type of document, but can exceed a hundred years (documents must be kept in a state in which they have not 'seriously deteriorated' after a hundred years). Imagine having to be able to access a document from a word processor that was used a century ago, reading documents created with word processors from ten years ago is practically an insurmountable task.

Under Dutch law it is possible to keep archives in an electronic form. The Dutch law regulating the archiving of documents in public archives introduces two important distinctions that need to be taken into account. The first is the distinction between originals and reproductions. A reproduction is defined as a duplicate of an original. The second distinction is between documents that should be kept permanently and documents that should not be kept permanently. The question whether a document should be kept permanently depends on appearance of a certain document type on a selection list be drawn up by government institutions.

For originals there are no specific rules other than the rules pertaining to the terms over which documents have to be kept. However, replacing originals with reproductions is subject to strict procedures. The procedure to be followed depends on whether the document should be kept permanently. If a document does not appear on a selection list in the 'permanent' category replacing an original with a reproduction requires an order from the keeper of the archive. Such an order can be of a general nature, that is to say, the order can refer to types of documents. If a document should be kept permanently, replacing the original with a reproduction requires the authorization of the Minister for Education, Culture and Science. What makes these requirements particularly cumbersome in electronic environments is that an electronic copy of a document is considered to be a reproduction. Since electronic document systems often utilize copies (a simple act such as opening a document in a word processor creates a copy of the document) the electronic handling of documents is subject to either an order of the archive keeper or an authorization of the Minister. The difference in regulation implies that the future status of a document has to be determined at the time of its conception. Section 2 described a situation where a document was created in a Ministry or another government institution. However, a similar situation occurs when one wishes to store an incoming document electronically. The act of digitizing a document is deemed a reproduction of the document, and, consequently, at the time the original is digitized, the (future) status of the document must be clear. This obviously creates a problem in the document-intake phase.

Another problem with electronic documents, especially electronic documents that have to be kept permanently, lies in a demand posed by the Dutch archive law: archives have to be kept in a readily accessible state. This implies that simply storing electronic documents is not enough. Archiving electronic documents also involves keeping copies of the applications (software) and equipment needed to be able to read the documents. Moreover, background information, for instance on data structures (etc.), has to be stored as well. If accessing the documents with the original equipment and software is no longer feasible, the documents have to be converted. This is again considered a reproduction and thus requires authorization. In addition to these complex problems, deterioration of (magnetical) media can also necessitate reproducing a document.

5.3 Authorization and Security

Three leading principles guide the topic of authorization and security: exclusivity (confidentiality), integrity (authenticity) and availability. Within the context of an internal document-handling system, the first demand is not the most important one. Usually there will be no problems with colleagues seeing the work of their peers. Of course the problem can become more relevant when an internal system is opened to the public, for instance, by linking the system to the Internet. The final principle, availability, is of particular importance in business environments. Not having an electronic system available (due to a malfunction or for some other reason) can have a paralysing effect on an organization. The question is whether the Dutch legal system poses any demands on the level of security that electronic systems have to comply with. The answer is yes and no. Several laws (for instance the Penal code and the legislation on privacy) include an obligation to maintain an 'adequate' level of security. However, what constitutes an adequate level of security is unclear. It stands to reason that the importance of the data contained in the system has a direct consequence on what is considered adequate; important data requires a high level of security. There are no direct sanctions when data is not protected adequately. Of course, leaving data unprotected can result in civil liability. Within the context of the Dutch Penal code, not having an adequate level of security affects the liability to punishment of persons intruding into an electronic system. Moreover, the admissibility of electronic data as evidence can be seriously impeded by an inadequate level of security.

5.4 Privacy

The final legal issue we discuss is privacy. Introducing an electronic document system can have serious effects on the privacy of employees. For instance, such a system facilitates electronic monitoring of the activities of civil servants involved in dealing with a document. Information on which and how many documents have been dealt with by a certain employee, how long he or she has taken to process the documents, what comments have been made (etc.) are readily available in an electronic environment. This implies that the introduction of an electronic document-handling system not only involves storing documents but also storing personal data. As a consequence, the rules applicable to the processing of personal data apply. Dutch (and European) law stipulates that processing personal data is only permitted with an eye to a certain predetermined goal. Moreover, in most cases, the processing of personal data has to be reported to the Dutch data-protection authority ('Registratekamer') and must not be kept longer than necessary. Thus, introducing an electronic document-handling system requires policy decisions in the area of privacy. If the system is introduced with the sole purpose of functioning as a document-management system, the data contained in the system cannot be used for assessing the performance of employees. In itself it is not forbidden to introduce a system to monitor employees, but this function has to be reported to the data-protection authority beforehand. Moreover, storing data specifically for employee assessment is not allowed if not reported to the

data-protection authority. Also, the employees have to be notified in advance of the monitoring of their behaviour.

6. Conclusions

Introducing an electronic document-handling system at a first glance appears to have a positive effect on the possibility to deal effectively with large numbers of documents within an organization. It becomes possible to route documents more efficiently, for instance by routing them in parallel, whereas it was previously only possible to route documents sequentially. However, introducing an electronic system is not without problems. We have categorised the problems as either organizational, logistical or legal. At the organizational level, we have shown that introducing an electronic system has serious consequences for the way in which the organization works. The reason for this is found in the fact that the procedure for dealing with paper documents strongly reflects the hierarchy of the organization and the competence of different departments. The introduction of an electronic system creates a situation where documents can be routed in new ways and such new procedures can affect the fabric of an organization. At a more basic level the tasks performed by the units handling paper documents become unnecessary. Logistically, keeping track of documents and delivering documents to the correct person becomes easier in an electronic system. Moreover, the monitoring of progress and signaling delays are also facilitated. However, since internal documents are often used to react to external situations (e.g. an incoming letter) it is either necessary to maintain a separate paper-based document circuit for incoming paper documents or to digitize incoming documents. Both solutions are not without problems. Additionally, an electronic document-handling system has extensive functional requirements. It must be possible to route documents flexibly, there must be a system for version management, and authorization and access must be regulated (etc). Legally the most complex problems flow from the requirements of Dutch law on keeping public archives. The requirements for replacing originals with reproductions complicate introducing an electronic document system. Moreover, the legal necessity to keep some documents over long periods of time introduces serious technical difficulties in areas such as the deterioration of media and the possibility to electronically access documents (etc). It thus appears that potential gains in efficiency in the early phase of electrification are nullified by legislation regulating the keeping of public archives. Some other areas in which legal problems may occur are authenticity and legality, authorization and security, and privacy. However, since an electronic document-handling system primarily serves an internal function, these problems are not nearly as pressing as when electronic documents are used externally. In addition to the issues discussed here are potential technical difficulties and issues relating to the cost of the project.