Chapter 4

CO-ORDINATION OF E-GOVERNMENT

Between politics and pragmatics

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Abstract: E-government is a move towards more use of networked information technologies in governments' services to citizens and companies. There will be strong expectations that these services are well co-ordinated and interoperable with the applications of citizens and companies. IT co-ordination is difficult, expensive and risk prone. The wide range of products and services in government makes co-ordination even harder. Co-ordination of e-government should therefore be carefully prioritised and the ambitions should be set at a reasonable level. Analysis shows that ambitions are often unrealistic, and that political goals seem to dominate over effective, stepwise approaches to co-ordination. On a pragmatic level, there is a need to focus on simpler, process-oriented mechanisms for co-ordination and to improve governments as software organisations. There are considerable challenges in the typical split of work between ministries and operative agencies in government.

Key words: public administration, e-government, IT co-ordination, technology adoption, information infrastructure

1. INTRODUCTION

E-government has become the commonly adopted term for modernising government with networked information technologies. Government is a large sector in most developed economies, and represents an important case for diffusion and adoption of technology. To a certain degree, governments have their own ways of organising and managing their operations, and also specific requirements and a very wide set of possible uses of information

technology. This represents challenges for the management and co-ordination of e-government.

As citizens and companies deal with different parts of government, and as there is a need to support lateral cooperation within the government sector, there is considerable need for co-ordination of e-government. This is reflected in many policy documents from various governments and from, e.g., the European Union. This paper discusses the realism of these efforts and contrasts them with practical experience and with relevant theory on information systems development. The intention with the paper is to provide a critical appreciation of current approaches to the co-ordination of e-government and to provide advice for realistic approaches.

There has not been a separate data collection for this paper. The topic of the paper was, however, my area of work from 1997 to 2001 as head of the IT-department of Statskonsult, the Norwegian Directorate of Public Management. In that position I could participate in and observe several projects, and I would read and comment upon policy documents on e-government. In the winter of 2000 I was given the opportunity to collect information from the Finnish government on the same topic, see Sørgaard (2000). The reasoning of the paper will therefore sometimes be theoretically grounded, sometimes based on practical experience or on talks with informants in the Norwegian and the Finnish public administrations. This paper is based on earlier contributions to the OECD project on e-government.

The paper is organised as follows. Section 2 introduces theoretical material on the range of issues touched upon in this paper. Section 3 argues in more detail that large organisations cannot have full control over their use of IT. Section 4 describes the nature of and challenges with e-government, while section 5 addresses management of e-government and section 6 discusses co-ordination of e-government. Section 7 draws some conclusions.

2. THEORETICAL BACKGROUND

This paper discusses the issue of management and co-ordination of e-government on the basis of several approaches: systems development, organisation theory, co-ordination in public administration, IT as infrastructure and finally studies of technology.

Systems development is a sub-discipline of computing science dealing with methods and theories for design and development of applications of IT. It has close connections to disciplines such as information systems and software engineering. Within the field, several systems development methods have been published. This paper comes out of the so-called

Scandinavian school in systems development, where systems development is seen as an organisational and indeed political process, besides its obvious aspects as a technical process. Dahlbom and Mathiassen (1993) have written a seminal introduction to this school of thought. Within software engineering much work has been undertaken to define appropriate models for conducting software projects. Boehm (1976) defined the traditional approach, dividing software projects into phases such as: system requirements, preliminary design, and code and debug. This so-called waterfall model has since been criticised for being too rigid, not allowing experiences from later phases to inform the requirements or the design. Boehm (1988) has himself dealt with this issue and proposed an iterative model, or a spiral model, for systems development. Humphrey (1989) has proposed the well-known Capability Maturity Model, which defines five levels of maturity in software engineering, and which also defines the process areas that need to be handled in order to “grow” from one maturity level to the next.

Organisation theory describes and discusses different approaches to deal with the challenges of organising work. Galbraith (1973) has written a classical theory, where the focus is on mechanisms for handling task uncertainty. In large organisations there is seldom one, ideal organisational design. Every choice of functional units, independent product divisions, etc. will represent a compromise between different needs. In practice, every hierarchical organisation will need to handle lateral relations. Galbraith discusses seven approaches to lateral relations, with increasing ability to co-ordinate (and with increasing cost):

1. Direct contact between managers
2. Creation of liaison role
3. Creation of task forces
4. Use of teams
5. Creation of an integrating role
6. Change to managerial linking role
7. Establishing the matrix form

Most of these designs can be observed in work with co-ordination of e-government, but the more radical designs are hard to implement in governments that emphasise ministerial autonomy. Ministers without portfolio, for example, are clear examples of an integrating role at a high level. Given the permanent crosscutting nature and derived co-ordination needs of some of the topics of e-government, attention to structure is important, but “structures, while important, cannot guarantee successful co-ordination” (OECD 1996, p. 20).

Williamson (1981) defines a transaction cost approach to understand organisations. He sees an organisation abstractly as a stable network of transactions, and sees the hierarchy (or bureaucracy) as an approach to

handle transactions which cannot be completely specified a priori, and which therefore are better handled in a more permanent relationship, e.g. in an employment relation. More transparent transactions can be handled in the market, and even more complex transactions need to be handled in idiosyncratic organisations such as clans or groups.

Co-ordination in government is an example of lateral relations. Eriksen (2001) compares the structures of the ministries in Great Britain, the Netherlands, Sweden, Finland and Denmark, with a focus on mechanisms for co-ordination. According to Eriksen the countries differ heavily in their ways to achieve co-ordination, and indeed, in the emphasis put on co-ordination. Great Britain represents one model with the dominant position of the Prime Minister and the Cabinet Office. Denmark represents another model where individual ministers make most decisions. Sweden is a third model, where the government collectively makes the decisions. Norway has many similarities with Denmark, and Finland has many similarities with Sweden, although they are not as archetypical as their respective former union partners. Other sources to co-ordination in government are OECD (1996), and Pollitt and Bouckaert (2000).

Eisenhardt and Galunic (2000) have studied how large corporations are organised in divisions and how synergies between otherwise independent divisions can be achieved. They suggest that work with synergies should start in the divisions in order to focus on realistic projects, and that the role of corporate management is to stimulate this kind of co-ordination, not to perform it. While exclusively borrowing from cases in private business, their discussion also has some relevance to government.

In a review of the current literature on the management of information infrastructure, Ciborra (2000) contrasts a traditional management definition and an alternative definition of infrastructure. The traditional definition sees information infrastructure as a layered structure with layers like IT components, human IT components, shared IT services, and shared applications. In this view infrastructure is seen as the largest component of a company's systems and applications, which are reliable, shared, and usually centrally managed. This view is closely connected to the idea of strategic alignment, which Ciborra criticises for its tendency to lock a company to its current way of doing business. Ciborra borrows the alternative definition of information infrastructure from Star and Ruhleder (1996), who characterise infrastructure as "fundamentally and always a relation". They state that it operates through standardisation and extension of linkages; it is sunk into other social arrangements, institutions, and technologies; it is invisible and transparent in supporting the execution of tasks; it is embedded in a set of conventions of practice; and it is an installed base: infrastructure does not grow *de novo*; and it wrestles with the inertia of the installed base and

inherits strengths and limitations from that base (Star and Ruhleder 1996, p. 113). Ciborra argues that the traditional definition assumes strong central control over the infrastructure, and that this is inconsistent with empirical observations of use of infrastructure that indicate that the evolution of infrastructure is better characterised as drift.

Star and Ruhleder (1996) analyse the experiences from a large-scale effort to support a geographically dispersed community of geneticists with infrastructural computer support: WCS, the Worm Community System. In doing so, they describe infrastructure as a relational property, not as a thing. In their analysis of the varied user experiences, they use Bateson's model of levels of learning to distinguish between three different levels of issues related to the computing support being analysed. First-order issues are straightforward and practical issues, such as "how do I hook up my workstation to the network?" Adding resources, training or information can solve such issues. Second-order issues stem from unforeseen contextual effects or conflicts between first-order issues, for example the dilemma between finding the computer best fitted for the community infrastructure and the computer best fitted for the local network and the local computer support. Such issues need to be resolved through co-ordination and planning at levels beyond what the individual user can accomplish through extra efforts and resources on her own part. Third-order issues are inherently political or related to ongoing conflicts or difficult tradeoffs. Examples here may be the view of the research field supported by the system or norms and culture related to openness, critique and information sharing. To the extent such issues can be resolved, it will involve discussions beyond the scope of design and use of the system studied.

The distinction between three levels of issues can be immediately applied to discussions about e-government. In a large-scale e-government effort there will be a lot of first-order issues: typical examples will be related to access to networks and equipment, training, stability of software, quality control, etc. Second-order issues may be a series of interoperability issues like the kinds of software and hardware needed to use the solutions. Moreover, there will be issues of adaptation of work practices in agencies to new expectations and service needs from citizens and companies. Third-order issues may arise as e-government aims collide or interfere with other political issues. Examples are reduction of work force in rural areas, conflicts between electronic transmission of documents and rules for data-security and authentication, archive regulations and informal practices with e-mail, and use of incentives for electronic solutions that may end up as privileges to those clients of government who are well equipped and trained to use computers. A typical political problem is related to whether, how, and

to what extent e-government initiatives can be used as a way to propel development of the domestic IT industry.

Studies of technology are also of relevance. Monteiro (2000) has made a summary of actor network theory. This theory gives room for seeing technology as an actor on its own. Ciborra (2000) argues that since an information infrastructure is so deeply sunk into social practices and shaped by factors not in control by one company, it makes sense to view an information infrastructure as an actor and to describe the relationship between a company and its infrastructure as more symmetrical. In a sense, this introduces a degree of apparent technology determinism, well in line with what we often experience in practice.

Yates (1989) has studied “new” technologies in American companies at the end of the 19th century. Her study shows how new technologies and new business practices evolved in a mutually adaptive pattern. Important technologies like the vertical filing cabinet and the telegraph were not “born” with a ready set of use practices. Their use evolved slowly, and thus such technologies, when introduced, contributed to important, unforeseen changes in the ways organisations worked. Yates’ study has much to tell us about our limited ability to predict how new technologies will be used, and about the processes through which new technologies are adopted by organisations and society. In a sense, we do not know what e-government will be like before we have it, and there is every reason to expect it to be different from common expectations.

3. LOSS OF CONTROL

Modern organisations shape technology for their purposes and are at the same time shaped by the technology they apply. Technology alone will seldom change organisations, and organisations must make efforts to be able to benefit from technology. Thus, we have neither full technology determinism nor full social (and political) control of the use of technology. Modern technology will, at least as seen from each organisation or each government, appear as an independent actor (Monteiro 2000).

The scope of ready-made software is expanding. As a consequence, a larger part of an organisation’s functional needs may be met by ready-made software. At the same time we observe that in-house development is risk-prone and expensive. Adapting ready-made software packages is also expensive, since adaptations often will have to be made by specialists and since adaptations typically will need to be refitted for new versions of the software packages (Hanseth and Braa 2000, Hanseth et al. 2001).

Increasingly, the challenge is therefore to use and harvest the potential benefits from ready-made software as it is.

A key area for ready-made software is peer-to-peer communication as supported by e-mail, instant messaging, chat, intranets and newsgroups, to mention a few. It is typical for these media that they invite to informal style (Eklundh 1986). Clashes between archivists struggling for persistence and reformers struggling for maximal use of new means of communication are not uncommon in government. Without appointing winners and losers in these battles, it can be safely assumed that governments will be heavy users of informal communication media. The question will not be whether to use, e.g., e-mail, but how, with what kind of culture and with what other means to ensure the needed degree of persistence.

The "effects" of use of IT in general and electronic communication in particular are hard to judge. In a summary of the computing and centralisation debate, George and King (1991) concluded that the theses of centralising and decentralising effects of computing were not well supported. They also rejected the statement that computing had no effect on this issue. Instead, they claim that computing tends to reinforce current structures, i.e. that in a setting where the dominant forces work for centralisation, computing will typically be applied in a way that further enforces that trend.

There are some observations that appear to be commonly accepted. Feldman (1987) observes, for example, that electronic mail is well suited to create and maintain weak ties. At least to some extent, this may support a trend towards less clear organisational boundaries.

Taken together, the observations above mean that a smaller part (in terms of volume and importance) of the communication takes place through official channels. To be concrete: middle managers, especially in government, used to be able to have an overview of incoming and outgoing communication as an effect of routines for distribution and approval of conventional mail. This source of automatic authority now erodes, and managers will need to learn other ways to manage.

The processes of developing software are hard to manage. Within the field of software engineering, serious efforts have been made to improve these processes (Humphrey 1989, Boehm 1988). The reasons for these problems are not only to be found in technical complexity, but also in uncertainty (Galbraith 1973) and in political games around the processes (Dahlbom and Mathiassen 1993). This calls for alternative approaches, less characterised by engineering and control, and more characterised by experimentation and flexibility.

As already mentioned, new technology is being used in patterns characterised by mutual dependence between actors. Organisations will therefore not enjoy full freedom in their development and application of IT.

They will rely on their partners, their suppliers, their customers, their employees and the available infrastructure where they are located. Organisations will look for ways to handle this, in terms of getting competent advice (from internal or external sources) about what aims to go for and in terms of finding adequate processes. We are seeing a shift from constructing IT for the (given) purposes of the organisation to looking for opportunities to support and also to change current business with new applications of IT.

There are important differences between countries and markets with respect to penetration rates of important technologies and with respect to availability of infrastructures and supporting resources. Within OECD there are significant differences in penetration rates of home-based Internet connections and mobile phones, and regarding diffusion of cable TV the rates vary from practically 100% (Belgium) to practically zero (Italy) (OECD 2001a). This is not only a question of some countries being ahead of or more developed than others, but different technologies appear to fit different markets differently: some countries are high on mobile phones, some on Internet, some on both, some on neither. There may be historical, political and even cultural reasons for these differences. For all kinds of organisations, these differences mean that the ways to approach e-business will differ between countries and markets. It may be hard to transfer “best practices” from one country to another, and it may also be hard to enact tight central control over IT in multinational companies.

IT represents an important enabler for organisations. Within a market, those organisations that exploit the potential of the technology better will “win”. Malone et al. (1987) use this kind of argument together with transaction cost theory (Williamson 1981) to predict that we will see a shift from bureaucracies to markets, since market transactions are better supported by IT than are transactions in the bureaucracy. We may use this line of reasoning to expect that some organisational configurations (one or several) will benefit more from new IT than others. We may further expect that these kinds of organisations through their increased market power will have a greater impact on the properties of ready-made software. This will result in a self-reinforcing effect, which over time will lead to shifts in the mix of successful organisational designs and in available technology. Most likely, this development will also have an impact on government, making certain ways of organisation more attractive, and in some cases make government more similar to private business.

In summary, the topics brought forward in this section indicate a certain *loss of control*. Governments do not have full control of their use of information technology because of their reliance of the market and due to the

use of information technology together with other actors. Obviously, this makes it hard to plan many years ahead.

4. WHAT IS E-GOVERNMENT?

Government is not one single thing. Governments are large, complex organisations with myriads of very diversified tasks. Governments are organisations that consist of many “parts” that are managed, funded and organised in different ways, and it is hard to draw a clear line between government and non-government. Given the wide area of application of modern IT, e-government can be seen as a large, complex organisation that uses different kinds of IT, that uses IT ubiquitously, at several levels, and for several different purposes.

Previously, governments used IT mainly for specialised purposes (e.g. calculation of taxes) and mainly for internal purposes. More and more, governments use general-purpose applications of IT (while still using IT for several government-specific purposes). Governments will therefore, to an increasing degree, acquire their software from the market and look more and more like other users of state-of-the-art technology. Current trends towards increased use of IT in governments’ relations with citizens (electronic service delivery) is an example of using general-purpose IT, in this case mainly the World Wide Web. As development costs continue to be high, and as the functionality of ready-made software continues to grow, this trend will go on. Thus, e-government is not an island with its own solutions, but a user of state-of-the-art technology that mainly acquires its software and hardware from the market.

Governments use IT more and more in their external relations with citizens, customers, clients, companies and partners nationally and internationally, as well as in internal inter-agency relations. In practice this implies a need for solutions that are interoperable with those of the partners. Choice of technology, functionality and speed of implementation are issues between governments and their partners. Thus, e-government uses technology together with other actors in patterns characterised by mutual dependence, where government is only one part.

Many governments work with public management reform, seeing IT as a driving force, tool or opportunity to achieve desirable changes. Important aims for government reforms are set out in national plans and in documents such as “Government of the Future” (OECD 2000). For the purposes of this discussion, e-government is a modernised, well-managed government still working to improve its way of operation.

Governments are different and so are their goals with public management reform and with the use of IT. Specifically, management and co-ordination practices vary widely from governments with independent arms-length agencies and a weak centre to governments with rather tight, central control (Eriksen 2001, Pollitt and Bouckaert 2000). Thus, there will be differences between governments as to what are acceptable and effective means for co-ordinating e-government initiatives. In a discussion of co-ordination of e-government it is worth noting, however, that acquisition of ready-made software *and* interdependent use of IT in relations with external partners may have a strong co-ordinating effect on e-government. This typically happens when standards, e.g. SMTP for e-mail or http for Web, are firmly established or when commercial products like Microsoft Word take all in a tippy market. Irrespective of government policies, the practical benefits of using the same software as most external partners are very compelling. Outsourcing of IT-services may also streamline the governmental application portfolio.

On a practical level, the ability to implement e-government initiatives is crucial (OECD 2001b). Information technology projects may be hard to plan and there is often considerable uncertainty and risk involved. As a result, it is hard to budget projects within conventional budget processes. One key approach is to divide the projects in smaller, separately useful deliverables, thus reducing uncertainty significantly.

In a context where we emphasize co-ordination, the strengths and weaknesses of project work need to be understood. A project is a one-time organisation with a specific aim. A good project focuses strictly on its aim, stimulating motivation and creativity to work in one direction. Productive project work may, as a consequence, be in conflict with broader ownership of the project's results and with the general aims of the organisation. A broader range of views in the project group may increase support for the results, at the expense of productivity in the project. This price may be worth paying, given the typical problems with a line organisation being in opposition to the results of the project (Sørgaard et al. 1997). This line of thinking is in a sense an application of Keen's (1981) strategy for countering counter-implementation. Getting projects to address issues beyond their own scope requires a certain level of professionalism and maturity in the projects. In the Capability Maturity Model (Humphrey 1989) such concerns are mainly addressed at levels three and above, considering good competence and adequate project management as prerequisites to taking inter-project issues on board.

Finally, there is a need to address the post-development work of implementing the changes in the organisation so that the expected benefits of the new solutions actually can become real. There are several reasons for

this. Often too little attention is paid to training (Star and Ruhleder's (1996) level one). In some cases, managers and other key personnel do not follow up use of the new solutions in practice (level two). Sometimes, use of the solutions is logically connected to a political or cultural process that has not yet found its resolution (level three). The assumption that structure and technology alone will solve the problem is a common one. Moreover, such an assumption may appear very appealing to managers with many other problems on their agenda, without any good ideas for handling the problem at hand, and with money to fund a project postponing other approaches to the problem. As an example, an agency may struggle with its procedures and "production line" for web publishing. This may be a difficult topic, as it involves topics on several levels, like technicalities of getting access to the right programs and directories (level one), misfit between involved technologies and inadequate document formats for electronic publishing (level two), and conflicts about control over the web-service and the agency's information policy and responsiveness to users in general (level three). Instead of entering such a myriad of issues, it may be appealing to fund an ambitious technical project that promises to solve all problems related to electronic publishing. In a sense, such a move represents an attempt (usually futile) at handling a level three issue as if it were an issue at level one or two.

5. MANAGING E-GOVERNMENT

In several countries, central initiatives have been launched to stimulate the emergence of e-government. Without, at this point, looking into the motivations of such initiatives, such initiatives and the importance of IT put the issue of managing e-government on the agenda.

5.1 Managing Risk

IT has often caused trouble for management. The problem of failed or vastly overrun projects is common, both in public and private sector (Oz 1994, Willcocks 1991). As a consequence OECD has made a separate policy brief on IT investments, drawing attention to issues of realism in ambitions, funding mechanisms and risk drivers (OECD 2001b).

In the analyses behind this paper, several government initiatives, mainly from Norway and Finland, but also from other countries, have been studied. There are many initiatives with excellent purposes, their goals rooted in the political aims of government, but with unrealistic ambitions and risk levels that were never really estimated.

One approach to deal with this issue, interpreted at Star and Ruhleder's level two, is to look at this as a problem of funding and competence: The government administrations' competence and capacity to handle IT issues should be assessed and, if needed, increased. Control mechanisms and review procedures should be introduced to avoid projects that lead to financial loss or failure to meet political goals. Such measures will have serious impact on work with e-government, as plans and projects ought to be screened according to the risks taken and the government's ability to run the projects and implement the results. Some apparently exciting projects may not be acceptable if screened this way. The projects that do get funding may have a reasonable chance of success. This is probably more important than launching flagship projects of high symbolic value.

Another approach, now at Star and Ruhleder's level three, is connected to the discussions on the relationship between ministers (and other political leaders) and their administrations, specifically on the impact of implementation issues on the policies. This is a delicate issue, as it is an important democratic principle that the minister, and not the bureaucracy, should be in charge. As governments often lack experience and professionalism in conducting large IT-projects, well-grounded assessments of the realism of apparently sensible proposals are hard to make. Giving room to implementation issues may be hard in many situations in government, and lack of IT-competence makes it even harder. Moreover, politicians often have a desire to achieve results within their period in office, a desire that may lead to political deadlines rather than deadlines based on sound estimates. Accelerated plans are a well-known risk driver and even a factor causing delays (Boehm 1981). This situation calls for restraint and carefulness. It appears, however, that administrations find it difficult to criticise policies and warn against "hopeless" projects, and sometimes administrations apparently feed politicians with unrealistic proposals.

5.2 Nature of Management Involvement

Within the Norwegian government, there has been an important shift from central control over IT (or EDP) in the 60ies and 70ies to a much more decentralised policy after that. The major reason for central control was cost control and a focus on economies of scale, making common investments in large mainframes a very sensible policy. The instruments put in place were also used, however, to support the national computer industry. Early in the 80ies a major shift towards delegated responsibility for IT took place. The main argument was that in order to ensure responsible investments and adequate fit with each organisation's needs, the financial and managerial responsibility for IT had to be within the line organisation. This policy has

essentially remained stable since then, although several initiatives for stronger central control have been launched.

The shift from centralised to decentralised control over IT reflects the change of computing from being a narrow-purpose, high-cost activity with well-defined and remote relations to the rest of the organisation; to a general-purpose, ubiquitous phenomenon, deeply integrated in the organisation and used by everyone. The normalisation of IT will therefore go hand in hand with a normalisation of the way IT is managed. Delegation and local responsibility are good managerial practices, and well in line with organisational designs which can handle complexity and uncertainty (Galbraith 1973, Mintzberg 1983). From a practical point of view, the issue is quite simple: if we want management in an organisation to act responsibly in relation to IT and uses thereof, management must have relevant decision power over IT in their own organisation. This principle needs some clarification:

- It reflects the approach to IT taken by a mature user organisation. It was of little relevance when IT was new and special, but as more and more tasks are fulfilled with the use of IT and more and more issues are connected to IT, its relevance is increasing.
- It puts a new burden on management. Since the way things are done is very much a question of the kind of IT and the way it is used, effective management will sometimes have to deal with practical and technical IT issues. For managers with little experience with IT and with little time to learn, this may be hard to handle.
- If we fail to observe this principle, management may tend to ignore IT issues or “abdicate” with respect to IT. Should this happen, it will have serious negative consequences for the organisation’s commitment to use IT productively and its ability to handle complicated issues, i.e. level three issues, related to IT. Observe, however, that we may get a sort of unspoken, unholy and unproductive alliance between IT-adverse managers in agencies and overly active, central IT co-ordinators.
- The principle does by no means rule out the need for co-ordination of IT, but may have implications for how to do co-ordination work. Top-down IT co-ordination that ignores the responsibility of local management will clearly be in conflict with this principle. On the other hand, co-ordination may take place with otherwise approved mechanisms of co-ordination, giving management the control needed.
- Local decision power over IT does not mean that every organisation makes its own choices and solutions. Many aspects of IT are determined by global technology development, expectations of partners, users, etc., severely limiting the freedom of choice of local decision-makers.

5.3 E-government as Infrastructure

E-government is closely related to issues of information infrastructure for government. Electronic service delivery and notions like “24/7” (service 24 hours a day, 7 days a week) would not be relevant if citizens were not using Internet and the World Wide Web. Hence e-government is sunk into practices and shaped by diffusion patterns of various technologies in ways that are not controlled by government, exactly as described in Ciborra et al’s (2000) analysis of information infrastructure (“from control to drift”).

Often, it is claimed that there is nothing special with IT, “it’s just a tool”. Seeing e-government as infrastructure may serve to stress that IT has a different role, not only in terms of our difficulties in dealing with it or controlling it, but also as a mix of technical and cultural “stuff” that to some extent set the conditions not only for how we can work but also for what we can sensibly do.

Star’s and Ruhleder’s (1996) discussion of the nature of infrastructure is useful to help understand efforts to extend or further develop e-government or government IT-infrastructure. “Infrastructure in use” must be addressed and the issues that typically reveal themselves in such change processes should be handled. Although, at a macro level, IT is an actor with strong impact on government, this view is too coarse to be applied in each project or in each governmental reform. Critical empirical work with analyses similar to those of Star and Ruhleder may give input for realistic agendas for change.

6. CO-ORDINATING E-GOVERNMENT

6.1 Setting Ambitions Right

There is every reason to discuss the need for co-ordination of e-government. Not because co-ordination should be avoided, but because co-ordination is demanding. There are immediate costs of co-ordination in terms of time, money and manpower. There are diffuse costs of co-ordination in terms of a tighter web of regulations and requirements to which new, creative initiatives must adhere and in terms of management and control structures that may be incompatible with central principles on autonomy and delegation. There are inflexibilities and vulnerabilities (and risks) connected to co-ordination when the same principles are to be practiced in a highly varied context and with different actors (Braa and Hanseth 2000, Hanseth et al. 2001).

Apparently, it is too easy to call for more co-ordination or to endorse government standards. It is relatively simple to highlight the benefits of common solutions. Moreover, taking initiative and getting things straight have an appeal to many. In sum, co-ordination may almost always sound plausible. Or, in the words of Eisenhardt and Galunic (2000): "A cornerstone [...] is letting heads of business units determine where and when to collaborate. If corporate managers take the lead, they often do not understand the nuances of the business. They naively see synergies that aren't there. They tend to overestimate the benefits of collaboration and underestimate its costs."

Often, the technological uncertainties and commercial dependencies with respect to certain technical choices are not well understood. As an example, government backing for standards like X.400 for e-mail and UN/EDIFACT for data interchange was very strong in some countries. Behind this support there were assumptions about the nature of technology development and diffusion that, at least with the wisdom of afterthought, appear to be unrealistic. Indeed, whenever initiatives for co-ordinated backing of specific technologies are proposed, one should critically ask: "How to know that this is the right technology?" The risk levels of such initiatives are often not well understood. Strong backing of the "wrong" standard may lead to voluminous erroneous investments. Extreme care should therefore be exercised in using the government's acquisition power in a standardisation battle.

The inflexibility that may come as results of tight standards is hard to communicate. Top-level managers and IT co-ordinators may be unaware of the vast differences in work situations, use patterns, needs for computing support, dependencies of other solutions, etc. that make common solutions less practical than what they appear to be. Tight IT co-ordination is hard in private corporations with a fairly narrow set of products and services. Most governments are much more diversified in their range of products and services than any private company. A government may run jails, hospitals, schools, railway-tracks, roads, embassies, police forces, airports, battleships, castles, museums, tax-collection offices, pension schemes, research labs, universities, libraries, churches and ministries. In most of these settings IT is abundant, and the variation in IT-equipment and its uses is enormous. There are not only differences in the products and services, there are also differences in how organisations in government are funded and managed, making common administrative support hard. Moreover, it may be hard to define where government ends and other actors start. Therefore, the government level does not, perhaps with some intelligently picked exceptions, appear to be a sensible level for much IT co-ordination.

In an offensive culture of "doers" it may be unpopular to argue against apparently good initiatives. Some of my informants confirm that the

initiatives they once endorsed, and that later totally failed, seemed very convincing when they were presented to management. If, in addition, there are weak traditions for analysing unsuccessful projects, government may never learn. As a result there is considerable room for seemingly attractive, expensive and highly unrealistic co-ordination initiatives.

Additionally, successful co-ordination does not only require the right central decisions, but it must also be possible to work it out in practice. This requires co-ordination mechanisms that actually work, and that the ambition level is adjusted to what is feasible with the given mechanisms. As previously noted, this requires a certain level of maturity as defined by the Capability Maturity Model (Humphrey 1989).

6.2 Dimensions of IT Co-ordination

In very large organisations like governments or international companies there will be several different constellations where interoperable IT solutions are needed. These define what I will call dimensions of IT co-ordination. In my own work with IT co-ordination in government and in private companies I have identified the following four dimensions:

1. *Co-ordination between local branches within an agency or division.* Large organisations are often organised in independent divisions, for example product divisions or nationwide agencies. Within one such division there may be many similar branch offices. There are large economies of scale in ensuring that all IT development is common to all these branch offices. Common solutions also make it easier to move clients' cases between the offices, and to ensure that similar cases are handled the same way by all branch offices. Centralised management of IT may be a logical way to implement legal requirements as to equal handling of cases in all branch offices. Pursuing this kind of co-ordination reduces local autonomy and local managers' responsibility for the solutions chosen. It puts a very high burden on the central developers' insight into the diversity and changes in needs in the branch offices. Within government, this dimension of IT co-ordination is normally strongly emphasised within nationwide agencies with tight control of their local branch offices, and less emphasised in administrative areas controlled by local government.
2. *Inter-agency or inter-division co-ordination.* Similar applications in different agencies need to work together in order to provide a consistent interface to the citizens (clients). As an example, companies ask for similar or standardised ways of reporting data to different authorities. Some clients of the welfare system need to be handled by more than one agency at the same time. Hagdahl (2002) studied use of IT within a local

initiative to better co-ordinate governmental and municipal agencies involved in vocational rehabilitation. She observed that reduced local autonomy and little technical flexibility made it hard for branch offices of nationwide agencies to participate in such local collaborations. Pursuing inter-agency co-ordination may lead to more integrated services for the citizens, but it may easily come at the expense of internal efficiency in the agencies. The steering mechanisms in public administration are often not well suited to achieve this kind of co-ordination. In work aiming at reducing the burden on businesses from obligations to report various kinds of information like employment, salaries, etc., the Norwegian Directorate of Public Management observed that seemingly similar kinds of information collected by the Norwegian Tax Administration and the National Insurance Administration were determined by legislation and by-laws worked out by different ministries. Discussions with staff in the ministries revealed that they did not realise the full extent of their roles as “managers” of large IT systems. In other words: decisions with major impact on the possibilities for achieving IT co-ordination were made without regard to this issue. This observation points at inherent inefficiencies in the way work is split between the ministries and agencies. There is therefore a need to let IT implementation concerns have an impact on decisions at the ministerial level.

3. *Functional integration.* Within each and every part of an organisation, product divisions, branch offices, sales offices, central administration, etc. there is a need for smooth interoperability between a broad range of applications in order to facilitate automation, reduce repeated registration of the same data, and provide users and customers with smooth services. As an example, electronic service delivery entails integration between services on the World Wide Web, internal case processing systems, client databases and sometimes also authentication systems. Previously independent applications are now tightly integrated. Functional integration may lead to highly automated systems and vastly reduced lead times. The costs are in development and in reduced flexibility.
4. *Co-ordination with external partners.* Increasingly, an organisation’s use of IT and its products need to work together with products and services from other suppliers. As an example, governments’ use of the World Wide Web and e-mail is largely interdependent with use of the same solutions elsewhere, as is evident in the proliferation of specific proprietary document formats. Another example would be reporting data from small companies, where governments need to find solutions that are easy to implement or are already available on commonly available equipment. Pursuing this kind of co-ordination requires flexibility and

sensitivity to what goes on outside the organisation. Through this kind of mechanism, outside actors like the Internet and large suppliers of hardware and software play an active role in establishing compatible IT solutions also within government. The benefits of this kind of co-ordination are in satisfied clients and in the ability to benefit from ready-made software and cost-effective self-service solutions. The drawbacks are mainly to be found in increased dependence on external actors.

6.3 Practical Mechanisms for Co-ordination

Whatever the conclusion is with respect to the ambitions for co-ordinating e-government, there is also a need to identify and implement mechanism for such co-ordination. Moreover, the nature of these mechanisms, their cost and their effectiveness, need to be taken into account when the ambitions for co-ordination are set.

In 2000, the Finnish Ministry of Finance performed a comparison of IT co-ordination at the central level in the Finish and Norwegian governments (Sørgaard 2000). Norway, at that time, had an IT co-ordination unit within the Ministry of Labour and Government Administration. The unit was relatively well funded but with limited decision power. As a result, the unit funded a series of projects as set out in an action plan for electronic government (AAD 1999). The organisational and political prerequisites for an electronic government and the risk level of the projects were not carefully evaluated. This represented a construction approach to electronic government, i.e. an assumption that a number of centrally funded pilot projects or demonstrators would contribute significantly to the development of electronic government.

Finland has an information management unit within the Ministry of Finance. In 2000 the Finnish Council of Ministers passed a decision in principle about information management in government (Valtioneuvosto 2000) where several goals were set, and, interestingly, several inter-agency co-ordination groups were defined. The Ministry of Finance was named chair of most of these groups. The information management unit does not have strong power, however, nor does it have resources to fund many large projects. This represented a weak co-operation model to co-ordination of e-government.

The Finnish and Norwegian models for development and co-ordination of e-government can be compared with the ministerial structures in the two countries. There appears to be a logical relation between the weak co-operation model and the consensus-oriented style of decision-making in Finland, while the construction approach was simple to implement within the Norwegian system of decision-making by individual ministers. A third

comparison of this kind would be the centralised power of the British e-envoy, and the organisation of the Office of the e-envoy within the Cabinet Office.

The OECD (1996) paper on building policy coherence defines a broad range of policy co-ordination processes, budget co-ordination and policy implementation mechanisms. It warns, however, against relying too heavily on policy making by budget and on the implementation capacity of the centre. As a logical follow-up, the OECD paper also discusses administrative culture, raising topics such as consultation-oriented culture, personnel management policies, and interdisciplinary meetings and shared frameworks of understanding.

Eisenhardt and Galunic (2000) emphasise the need for focused, data oriented meetings between responsible managers. Inspired by them and having regard to the issues above there are many simple, process-oriented, co-ordination mechanisms available:

- There is a need for places to meet for people working with related topics and who want to share information and discuss common professional problems. In its simplest form people organising themselves can implement this. Slightly more ambitious, common seminars and on the job training can provide such meeting places.
- Every systematic attempt to co-ordinate across sectors will need inter-agency bodies that meet, exchange information, discuss and sometimes also make decisions. Given the nature of most governments, such bodies must rely on decision by general consent.
- On a bilateral basis, separate units may use each other to help with quality assurance and reviews of plans, designs, and strategies, etc. This is a lot cheaper than external consultants, and will be useful as plain advice, and also as a way to build competence and mutual awareness of what is going on, preparing for more co-ordinated strategies next time.
- In some governments there are central or common advisory units within the field of administrative development, e.g. the Norwegian Directorate of Public Management. Such units may, without any formal power, work as channels for exchange and accumulation of experience. They may even, through their impressions from different agencies; provide ministerial policy units with valuable observations of the practical problems of e-government implementation. Getting this learning-cycle to work would be very beneficial to policy development. In practice, private consultants will contribute in a similar way to improved co-ordination through their contracts with different agencies. Their feedback to policy units may be limited, however.
- Within a government based on the directorate model (arms length agencies), the ministries may have considerable room with respect to

how they govern and follow up their subordinate agencies. If the only concerns raised in these steering and reporting processes are sector-specific issues, the agencies will most likely behave accordingly. If, however, these processes address the agencies' contributions to crosscutting policy issues, more co-ordinated performance can be achieved.

- Within the classical bureaucracy people may experience that the only behaviour that really pays off in terms of career is narrow focus on sector-oriented goals, in spite of a general rhetoric supporting co-ordination. Evidently, career and money count more than rhetoric, and therefore governments that want to strengthen crosscutting policies in general and consistent approaches to e-government in particular need to address personnel management and cultural issues within the bureaucracy.
- Finally, once personnel management is seen as a part of the implementation of the policies, systematic exchange and rotation of personnel, inter-ministry career plans, etc. can be implemented.

6.4 Discussion

The four dimensions of IT-co-ordination in section 6.2 are all relevant for the co-ordination of e-government, and all four have their benefits and costs. Each and every concern for co-ordination results in a set of requirements and restrictions that need to be observed in further development work, resulting in higher costs and less creativity. As a result, needs for co-ordination must be prioritised, and some needs simply cannot always be taken on board. Among the four dimensions it is obvious that the first dimension (within the agency or the sector) has high priority and is well aligned with management structures. The third dimension (functional integration) must be given priority in order to realise the efficiency potential of IT. The fourth dimension (with external partners) is a necessity today, as a large part of the potential for good use of IT lies here. The dimension that “suffers” will easily be inter-agency co-ordination: the power structure does not strongly support it, it requires changes at a high level in the bureaucracy and the benefits are not as obvious as the benefits of the three other dimensions. If benefits with this dimension are to be achieved at the expense of other benefits, the case for this kind of co-ordination is weak.

This issue has a direct relation to the dilemma in organisational design (and government reform) of co-ordination vs. use of autonomous agencies (Pollitt and Bouckaert 2000, pp. 165–166). This dilemma is, in my experience, rarely touched upon in policy documents on e-government. An important and elegantly formulated example to the contrary can be found in

a decision by the Finnish Council of Ministers: “a basic problem is how the agencies’ responsibility for results and autonomous operation can be retained while at the same time ensuring the interests of the government administration at large in questions pertaining to interoperable systems and shared use of information resources” (Valtioneuvosto 2000, author’s translation from p. 14 in the Swedish version). Much money could be saved and more real progress would be made in efforts with e-government, if this dilemma was understood and paid attention to in plans and strategies for e-government. The inherent contradictions in this field rule out easy solutions. Efforts on IT co-ordination across sectors must be strictly prioritised, with due attention to costs and negative side effects.

Section 6.3 points at a set of weak co-ordination mechanisms that may be implemented at low cost. The clue with those mechanisms is to avoid putting too much responsibility for co-ordination on the already over-burdened centre of government. Instead, various incentives, weak mechanisms and pieces of culture can be put in place to create an organisation which, when needed, is more likely to search for co-ordination of solutions at its own initiative. If mechanisms of this kind are not in place, co-ordination from above may easily fail. In my experience, there is relatively little emphasis on such practical mechanisms for co-ordination, with the Finnish inter-agency co-ordination groups as a notable exception. Within the framework of Star and Ruhleder (1996) this discrepancy may find an interpretation as a third-level issue. Some of the central plans for co-ordination can be seen as political initiatives of symbolic value or as expressions of inter-ministerial power struggles. It would be naïve to assume that such issues are absent, and even the most well intended attempt at achieving co-ordination might meet suspicions and resistance. A practical agenda for co-ordination of e-government will therefore need to use mechanisms that do not get interpreted as an attempt at grabbing power from some co-ordination unit.

There are several reasons to show care in finding a realistic level of ambitions with respect to co-ordinations of e-government. Yet, there are important successful examples that need to be recognised. Both Finland and Norway have had important benefits from well-defined personal ID-numbers. Norway has had success with a common exchange format called NOARK for mail records (i.e. data records describing correspondence to or from government). The Finnish Ministry of the Interior heads a working group on data formats, and the working group maintain a web page with agreed formats, ready to use for system developers within as well as outside public administration. Defining data for core government topics is a task for government, and is often implicitly done as part of the ministries’ work with by-laws for various administrative areas. Difficulties arise, of course, when different ministries work with by-laws for overlapping issues.

7. CONCLUSIONS

First of all it appears that the difficulties of co-ordinating e-government are underestimated. Although the case for inter-agency co-ordination is strong, the analysis shows that other dimensions of co-ordination will receive more attention. The differences within government are very large. Governments should therefore check their ambitions and prioritise goals with crosscutting co-ordination carefully. The three-level framework of Star and Ruhleder (1996) may be useful in selecting realistic projects. It is also evident that a lot of practical co-ordination has taken place through the ongoing standardisation in the software market. The aim of providing services to companies and citizens will most likely further increase the use of generally available (commercial software or freeware) solutions.

There are viable, practical alternatives to pursue co-ordination of e-government. These may be “low-key” mechanisms, but they will improve the foundation for co-ordination in the future. Little emphasis on such simpler mechanisms indicate that the agenda behind many co-ordination initiatives is more of a political or symbolic nature, and that explanations are to be found in inter-ministerial power relations.

If, however, there is a sincere interest in improving co-ordination of e-government, there are pragmatic alternatives available. Since co-ordination requires development projects to address concerns beyond their own mandates, there is a need to increase the maturity (cf. the Capability Maturity Model) of governments as software organisations in order to increase the likelihood of successful co-ordination.

Differences between countries are large. It is worth asking to what extent countries with highly different traditions for governmental decision-making can learn from each other when it comes to co-ordination of e-government. The British model with an e-envoy may, for example, be successful there, but may fit less well in a structure with more independent ministries like in Norway and Denmark. Further studies and critical evaluation of experiences are needed to approach this question.

Issues of implementing e-government in general, and of achieving desired co-ordination in particular, address the split of work between ministries and agencies, and between politics and administration. From a systems development point of view there is a need to let implementation issues have increased impact on policies and goals that today are defined in ministries. This is needed in order to achieve a situation where governments learn from the experiences of previous projects and co-ordination initiatives. The current split of concerns between ministries and agencies may inhibit the successful adoption of information technology in government. There are considerable challenges in finding ways to manage information technology

in government that create the best foundation for using the technology, while at the same time addressing issues of co-ordination and need for democratic political control.

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