

Organizational, Technological and Regulatory Challenges for Realizing Electronic Government

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Abstract-In this paper we discuss the main challenges faced by electronic government initiatives. First, the components of and the demand for electronic government services are identified. Then we point out infrastructure requirements on the technological level for both the service providers and the customers. Organizational challenges are discussed with a focus on integration and coordination requirements. The need for regulation is shown in respect to public information access and security concerns with transaction services.

I. INTRODUCTION (DRIVERS OF E-GOVERNMENT)

The potential of information and communication technologies (ICT) not only to improve the efficiency of public administrations' internal operations but also to support the interaction between public administrations and citizens or businesses has increasingly been acknowledged on all levels of government in many countries and is currently discussed under the heading of 'electronic government'. The term mainly relates to the use of electronic media to support the delivery of government information and public services. But it also covers the internal use of ICT within public administrations to improve the efficiency of operations.

A main characteristic of electronic government is the intensified use of electronic media for supporting the interaction between citizens and businesses on the one hand and institutions of the political system on the other hand (public administration, government, parliament, etc.). Certain applications of electronic government are often regarded as a subrange of electronic commerce. In this respect, however, it has to be noted that administrations cannot focus under market considerations on certain customer segments, but their service supply is to a large extent legally given. Not to forget, that there are also electronic government applications, in which the citizen not only takes the role of a customer or consumer but acts as a political being (*zoon politikon*).

The idea of electronic government relates to a broader discussion on changes in the public sector and its driving forces: an increasing *pressure on public budgets* stimulating new ways to increase efficiency and performance within public agencies; a *restructuring of public sector functions and service provision* along with the trend towards privatisation and outsourcing ('reinventing government'); a growing *demand for supporting legitimation*, convincing citizens of political projects and justifying public administration procedures especially in the European Union ('a Europe of the citizens'); and a general *change of management philosophies* and their application on public sector activities ('New Public Management').

The main effects which are expected with the implementation of citizen-oriented electronic services by government agencies boil down to the following three ends:

- provide better and more efficient services to businesses and to citizens (including responding to their needs in a more direct way),
- improve the efficiency and openness of government administration, and
- secure substantial cost savings for the taxpayer.

But achieving these aims requires to:

- facilitate access to electronic services,
- re-engineer services and re-organise the internal structure of the public administration,
- communicate and co-operate more efficiently between different departments and agencies of the public administration, and
- cope with restrictive budgets and personnel policies in the public sector.

The international discussion regards a number of factors as important for the development, implementation and sustainable supply of electronic government services. Relevant principles are to guarantee wide accessibility, to provide technical and non-technical options, to maintain confidence in the quality of a service, to prevent abuse and to redesign administrative flows. Key issues of success in E-Government projects therefore can be located on technical, organisational and regulatory level, which will be discussed in the following. An overall success factor is reputedly the degree of demand-orientation.

II. COMPONENTS OF E-GOVERNMENT

In principle an internal and external perspective of electronic government can be distinguished. The *internal* use of ICT covers word processing, databases, workflow systems etc. with the aim of improving information management and administrative processes. This affects organizational relations both horizontally (between agencies, departments, ministries, etc.) and vertically (between federal, state and local administration). The *external* use of ICT comprises the electronic supply of information and services as well as communication possibilities in the relationship between state and citizens. For a successful implementation of electronic government both the internal and the external component must be developed and also co-ordinated.

The rapid diffusion of the Internet has also led to an increasing supply of electronic services by institutions of the government and administration. While there are already numerous information and communication services available, transaction services, which initiate electronically the movement of goods or the delivery of services, are only since recently a fully developing application field.

TABLE 1
APPLICATION AREAS AND ELECTRONIC GOVERNMENT SERVICES

	information services	communication services	transaction services
everyday life	information on work, housing, education, health, culture, transport, environment, etc.	discussion fora dedicated to questions of everyday-life, jobs or housing bulletin boards, etc.	ticket reservation, course registration, etc.
administration	public service directory, guide to administrative procedures, public registers and databases	email contact with civil servants	electronic submission of forms
political participation	laws, parliamentary papers, political programmes, consultation documents, background information in decision making processes	discussion fora dedicated to political issues, email contact with politicians	referenda, elections, opinion polls, petitions

In the case of electronic government the three main forms of electronic services - information, communication, transaction – basically find application in three areas: to support the organization of everyday life, to handle administrative matters, and in the context of political processes of opinion formation and decision making (Table 1).

Transaction services are generally seen as the future of electronic government services, since forms have a key role during administrative processes. In a German Delphi study [1] the experts interviewed regarded electronic dealings with government as realistic within the next ten years. The British Prime Minister Blair announced in 1997 that in Britain by 2002 25% of dealings with government should be capable of electronic delivery, 50% by 2005 and 100% by 2008 [2]. Transaction services in general belong to the domain of electronic commerce, an application area which is not basically new. However, in the past this was limited to the exchange of business data in closed networks, mostly between enterprises with already established business relations. With the Internet electronic commerce can become a mass phenomenon, in the sense of transactions between enterprises or the public administration and the average consumer.

The complexity of applications is increasing from information to transaction services, both with respect to the technical and organisational implementation as well as the conditions of use. Therefore projects of electronic service delivery usually start with information services while more complex services are often considered later on. In contrast to information and communication services it is essential that transaction services are closely integrated with the inner technical and organisational structure of the service provider.

Looking at concrete examples one can find a great variety of electronic government services at different stages of development and implementation. As regards *information* services it can be noted that in the last years there has been an increasing number of websites established by government agencies around the world.¹ In many countries there exist at least one central point of access – also called ‘single entry

point’ – to the variety of websites of federal, state and/or local authorities.² These portals are usually directories of government departments or agencies with a link to the respective information service. But the bare directories of a country’s government information sources may be of limited use for the citizens if they are seeking information in the context of concrete life events like the birth of a child or moving to another place. Therefore in some countries public service directories have been developed, which are oriented at such life events, like the online public service assistant (@mtshelper online) in Austria.³

As regards *communication* services the potential of electronic platforms for citizens to discuss political issues with or without the participation of politicians or public servants seems to be already widely recognized. But those applications often lack of mechanisms to affect actual political decision making. A positive example in the UK is the consultation process of the Freedom of Information Act proposal using the Citizen Online Democracy service.⁴

In the field of *transaction* services the lack of legal regulations, i.e. on electronic signatures, is still a main barrier to the advance of applications. In many countries efforts to implement electronic forms take place, but progress seems to be rather slow.⁵ Today citizens in the industrialized world can access quite much government information online, but two-way electronic interaction is not very common. Tax filings, applications for licences or permits or any kind of queries relating to administrative procedures are still mainly accomplished through postal mail and by telephone or in-person contact.

¹ The Cyberspace Policy Research Group (<http://www.cyprg.arizona.edu>) recorded only 142 websites in 1995 but 2617 in 1998.

² See for example <http://www.open.gov.uk> (Great Britain), <http://www.admifrance.gouv.fr> (France), <http://www.fed.gov.au> (Australia).

³ Similar services can be found in Portugal (<http://www.infocid.pt>) or Finland (<http://www.opas.vn.fi>).

⁴ <http://foi.democracy.org.uk>

⁵ An investigation of german municipality websites shows that 11 per cent offer on-line forms, 22 per cent forms for download and 67 per cent no forms at all [3].

III. DEMAND FOR E-SERVICES

On the side of the *users* the demand for electronic government services can be viewed as another step along the trend towards a do-it-yourself society. But there is also the fact, that the need for citizen information is rising, particularly as regards information about benefits and individual rights. This tendency may be attributed to several factors; among them are the change of social security benefits, demographic changes (an increasing proportion of the older population, immigration), the reform of the public administration and last not least rising expectations due to the increasing diffusion of information technology among private households [4].

A special inquiry of the 1998 Eurobarometer, which is a continuous, half-yearly survey in the European Union member states, illustrates the opinion of the EU population on electronic government services (Fig. 1).⁶ In Austria the interest in electronic services of the municipal administration is about 39.2 % of the population, which is below the European Union average (47.8 %). However, the readiness to spend 10 ECU per month for such services is in Austria higher than the European Union average (A: 13.9 %, EU: 9.4 %). Applications in the area of political participation interest only 10.9 % of the EU population, whereby there is hardly any readiness to spend some money on that (2.5 % of the recipients).

A representative survey of the German population carried out by the B.A.T Institute for leisure research [5] shows that 46 % of the recipients would like to complete administrative contacts at the computer. Surprisingly this interest is much stronger than for example the interest in online travel booking (37%), tele-shopping (35 %) or tele-banking (30 %).

On the side of the *providers* of electronic government services several reasons for establishing a website are commonly articulated. According to a survey of 16 countries worldwide [6] the key motivation in most countries is the improvement of public services (Fig. 2).⁷ A 1998 survey shows that senior public servants in Germany, France, Italy and the United Kingdom consider the interaction between departments and citizens as the main application area of electronic government – even more important than interdepartmental interaction [7]. The respondents also think that the most significant objective for implementing electronic government is to improve the quality of service.

A general observation is that insufficient attention seems to be paid to a ‘demand-driven’ implementation of electronic government services (demand as defined by citizens and businesses). In practice top-down definitions of demand for electronic government services rather than directly demanded approaches tend to dominate. Government agencies often start to provide electronic services where the provision does not require much extra effort (e.g. information is already

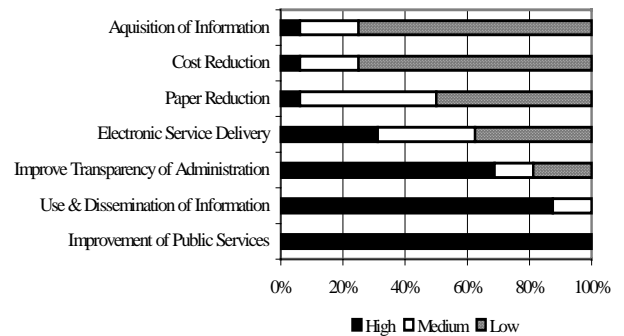


FIG. 1. MOTIVATION TO USE TELE-ADMINISTRATION SERVICES

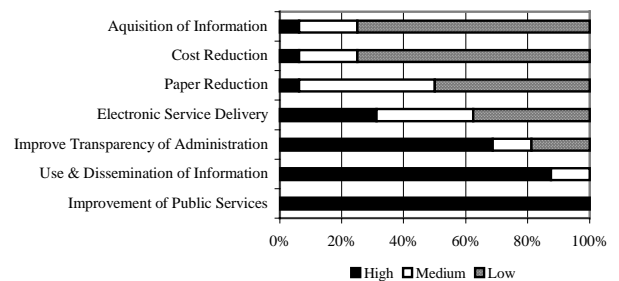


FIG. 2. MOTIVATION TO PROVIDE E-GOVERNMENT SERVICES

available in digital form). But this approach may differ from citizens’ expectations both as regards the content of a service and the form of its provision. This could lead to a gap between an administration-led supply and expectations on the side of citizens. A wider use of instruments for demand identification and feedback analysis in the planning of electronic services by government agencies would therefore be advisable. This should be based on criteria like average frequency and volume of usage, achievable time- and cost savings for users, service quality improvements, contributions to social inclusion, costs and benefits for administrations.

Orientation on the demand of the customers has to take into account also the requirements on the side of the service provider to meet this demand. Since the development of electronic government services usually requires profound restructuring in the public administration and therefore represents a long-term target, priorities have to be set. One strategy would be to focus initial efforts on those services which are closely connected to common life situations of citizens (e.g. birth of a child, moving) and/or which facilitate interactions of high frequency (e.g. tax filing).

One example for an electronic service based on life situations, in which citizens need information and support to carry out all necessary administrative procedures, is the online public service assistant (@mtshelper online) in Austria. On the first level (in operation since Dezember 1997) of imple-

⁶ A surprising result is the stronger interest in electronic government services compared to other fields of electronic service provision like travelling, shopping, or banking.

⁷ This survey was carried out in the context of the G8 Government On-Line Project. The countries investigated were: Australia, Canada, Finland, Germany, Hungary, Ireland, Israel, Japan, Korea, Malta, New Zealand, Norway, Portugal, Sweden, UK, USA.

mentation only information on selected administrative procedures is provided. The next level will be to pass on citizens' inquiries directly to the electronic services offered by the relevant government agencies. On the last level it is planned to provide an interface which allows the completion of all necessary contacts with the public administration caused by a specific life event in a single contact (one-stop service).

IV. TECHNOLOGICAL CHALLENGES

One can imagine several ways to access electronic services:

- PC with Internet connection at home, at work or at public places (eg library, post office),
- digital TV (eg set-top box),
- public kiosk systems,
- usage of existing terminals (eg automatic teller machines)⁸,
- mobile phones.

On the side of the *service provider* infrastructure requirements depend on the type of electronic services offered. Information services in the most simple form only need some space on an internet server to store HTML-pages.⁹ The provision of communication services requires email addresses and in the case of discussion platforms some more or less complex software to run such applications. Transaction services are the biggest challenge to the provider, because the data submitted by the user need to be processed and a secure environment for data submission needs to be set up.

The security problem connected with transaction services comprises three aspects:

- Privacy: The information being transmitted cannot be read by unauthorized parties.
- Integrity: The form and content of the message have not been altered.
- Authentication: Citizens and government agencies must be sure that they are in fact communicating with the intended party.

If sensitive information – like tax information, records on health care or entitlement to government benefits – is involved, there have to be strong protections for privacy, integrity and authentication. The most common technical solutions for all three security aspects are based on cryptography, which is a central concept for questions of security in electronic networks.

For efficient internal processing of data in the public administration a government intranet is needed which includes not only different administrative units (ministries, agencies, etc.) but also different levels of government (federal, state, local). In Austria it is tried to create an administration network with common standards, which is expected both to spur innovation and to increase cost efficiency within public administration. The *Corporate Network Austria* (CNA) is operated by the Federal Computer Centre (which was until

1997 part of the Ministry of Finance). The CNA is an ATM-network covering the capital cities of all provinces (nine), to which all district authorities (incl. administrative departments and social security agencies) are connected with 2Mbit.

In order to ensure the flexibility and scalability of electronic services, single solutions for specific applications, which cannot be integrated with others should be avoided. Furthermore, uniform information models are necessary for co-operation and efficient information exchange between individual administrative units on the one hand and between the administration and (external) providers of services on the other hand. An often recommended strategy is to build up specific applications on the basis of certain system layers: front-end (interfaces and applications), middleware services (e.g. authentication, payment), back-end (incl. legacy systems). Altogether such a concept relies on interoperability of individual applications and system levels, on the possibility of a module-like expansion of the system, on guaranteeing security and on providing guiding aids for the users.

On the side of the *users* the required technical infrastructure is not so much dependent on the type of services offered - at least in the case of the Internet as delivery channel. Internet access and the browser software provides almost any technical requirements necessary for the use of information, communication and transaction services. Additional requirements may occur if for example a chip card is used for providing a digital signature in the course of a transaction service.

The main barrier for the citizens to use electronic government services is access to the Internet. Today only a small percentage of the population is able to use a PC with an Internet connection either at work, at home or at a public place (e.g. libraries, post offices). In Austria currently 30 percent of the population over the age of fourteen have access to the Internet (14 percent at the office, 18 percent at home).¹⁰

Apart from the lack of access on a technical level there are further barriers which may prevent people from using electronic government services: socio cultural barriers (attitude towards and perception of new media), qualification barriers (cognitive and physical abilities, media literacy) and financial barriers (costs of equipment and usage).

Kiosk systems, i.e. easy to use computers (e.g. Touchscreen) being available in public places (e.g. shopping centres, libraries, post offices, hospitals), represent an access possibility for users without own infrastructure. But even if public access points experience a stronger diffusion in the future, their range of application will largely remain limited to information retrieval.

In many cases of administrative contacts people may prefer a private situation for filling out forms, which is usually to be found at home. This leads to a stronger need for individual equipment. Therefore, in the case of using smart cards for electronic signatures the availability of appropriate readers is an important diffusion factor.

⁸ For Great Britain the use of BT Touchpoint, bank ATMs, supermarket checkouts, National Lottery terminals is suggested [8].

⁹ More advanced applications may use databases to provide information.

¹⁰ These numbers from the Austrian Internet Monitor refer to the first quarter of 1999 (see <http://www.orf.at/facts>).

V. ORGANIZATIONAL CHALLENGES

International developments towards e-government show that these are closely related to reorganization processes in the public administration. During the last years in numerous OECD countries administrative reform initiatives have been started. These have been stimulated by such diverse factors as political change and budget squeeze, increasing competition, a lack of cost transparency, bureaucratic structures, a change of values and expectations of citizens, businesses and civil servants as well as by demographic developments.

Reform efforts are mainly oriented along principles of "New Public Management (NPM)" which has emerged at the beginning of the 80's as a new modernization philosophy in public administration in Anglo-saxon countries, Scandinavia and in the Netherlands. Similar reform movements started in Germany and Austria in the 90's under the title „Neues Steuerungsmodell“. NPM is often used as a header, but underlying approaches are quite diverse. Nevertheless common aims are to increase internal efficiency and to strengthen the control of expenditures.

In the context of NPM it is also argued that large bureaucracies inevitably take control away from the citizens and their role as voters. The introduction of market principles (competition, contract relations, etc.) is seen as a corrective device and especially necessary to increase efficiency and quality of public services. In the 90s this reform trend was completed by increasing service or customer orientation. One result has been the principle of one-stop service.

The international discussion around administrative modernization has got new momentum by the 1993 American status report "National Performance Review" and by taking up new management concepts from the private sector, in particular the concept of Business Process Reengineering.¹¹

As regards consequences for the internal reorganization of public administrations on the one hand and their external relations with customers on the other hand, challenges and requirements are different:

Internal reorganization in the course of informatization requires first of all a re-orientation away from the classical concept of paper-based processing of files and records. At present administrative processes, organizational solutions and standards are substantially based on the principle that all information is stored on paper. This situation has hardly been changed by the increasing use of computers. New administrative concepts (NPM, BPR, etc.) do already incorporate the use of ICT as a core element, especially in two ways:

- breaking up organizational boundaries through a client/server architecture ("networked decentralization"), and
- process orientation through workflow systems.

A critical point in this development is the organizational uncoupling, i.e. the handling of cross-organizational workflows, mainly because of the obligation to abide by the formal rules of administrative processes. In contrast to business processes where rules can be widely determined by the enterprise, administrative processes are rather strictly regu-

lated by laws and guidelines. That means, the radical impact of the Business Process Reengineering approach is limited by normative regulations and the possibilities to modify or adapt them.

Another issue is the type of project approach to be taken: In general top-down approaches tend to lead to more profound changes than bottom-up approaches, but the latter can be more easily realized. However, it has to be noted, that the result of a top-down re-engineering may not fully correspond to the actual needs of the service customers. Therefore participative methods have to be considered in order to integrate the citizens and businesses into the design of the future service delivery (e.g. through user panels or discussion platforms).

In the reorganization of *external relations* of public administrations with their customers additional guiding concepts and visions play a role. In the 80's the model of "citizen offices" was a central reform concept on the level of municipal administration. In the 90's the orientation at new public management shifts emphasis on other targets: While the citizen office model promotes a participative understanding of politics and democratic governance, the principles of new public management rather focus on economical issues of cost control and the "lean management". Nowadays it can be regarded as a particular challenge of administrative reform to achieve a synthesis of both approaches [9].

New arrangements of external relations have to be viewed also from the perspective of self-service or transferring/shifting functions of intermediation to the customers [10]. Reorganization may have both effects of dis-intermediation (e.g. direct electronic interaction with an authority) and of re-intermediation (e.g. banks as providers or mediators of public services).

A central goal of electronic government visions is improved service for customers which is nowadays most often associated with the notion of 'one-stop service'. Together with its almost inflationary use the meaning of this concept has become rather blurred. Understood as the integration of several government services within one access spot (either a physical location or a 'virtual window' on the Internet, a public access kiosk or a call-centre) it is typically based on the use of ICT. Practical realisations by public administrations remain a big organisational challenge as is indicated by only modest implementation to date [11]. Difficulties are posed by indispensable requirements such as continuous cooperation among different units of administration (e.g. data exchange and maintenance), reorganisation of departmental functions, adjustments of associated regulations and safeguarding skill adaptations.

Concluding from the organizational demands and problem areas of current processes of modernizing administrations several integration and co-ordination requirements can be emphasized:

- coordination of organizational reform and process innovation through the use of ICT;
- coordination of internal changes in the administration and organization of the external relations with service customers;
- coordination of technical investment decisions in separate areas of the administration.

¹¹ <http://www.npr.gov>

Therefore a substantial prerequisite for long-term success and economic use of resources is to establish appropriate co-ordination mechanisms which need to be equipped with the necessary resources and instruments to carry out the functions of adjustment and harmonisation.

Country-specific institutional and administrative structures represent different conditions to meet these coordination requirements. They are to some extent constraints for particular coordination strategies, in particular by established areas of jurisdictions. In the case of Austria the use of ICT in individual Ministries is primarily co-ordinated through four-year plans pointing out the basic strategy and yearly plans about concrete IT projects which have to be submitted to a coordinating department at the Federal Chancellery for adjustment across ministries [12]. Further there is an IT-commissioner in each department, who should safeguard to avoid uncoordinated activities within a department. However, it must be stated that the coordination possibilities of the Federal Chancellery are limited through the principle autonomy of the individual ministers. The shifting of EDP units due to redistribution of agendas between Ministries every now and then further increases the need for co-ordination.

Electronic government services, especially in advanced stages (i.e. transactions), very often cross several domains of authority (ministries, provinces, municipalities). The elaboration of an IT cooperation agreement between federal and state level in Austria has therefore been an important step for co-ordination improvement [12].

On the other hand, the need for a closer integration or strategic and operational linkage of administrative reform and IT strategy has not been addressed with the same priority.¹² Efforts towards an integration of organizational and technical modernization concepts can be found in particular fields of administration, e.g. the central office of statistics or the job market service. A step towards a unified platform of the public administration in Austria which connects networks of different administrative levels, is the Corporate Network Austria (operated by the federal computing centre).

VI. REGULATORY CHALLENGES

There are mainly three kinds of subjects associated with e-government which pose policy decisions and regulation issues: (1) access and ownership of public sector information, (2) pricing and use of electronic services, (3) digital signatures.

(1) Among the many issues around the design of public information policies the questions of *which public information should be accessible to what extent and under which conditions* are of central importance. There are three main stakeholders in the availability of public information:

- The public sector is producer and owner of a large variety and vast amount of relevant information, such as financial and economic data, public registers (e.g. land register,

business register, etc.), geographic data bases (maps, environmental information) as well as scientific, technical and cultural information in public research institutions, archives and libraries.

- The citizens need various kinds of information, for instance on legal norms or administrative procedures in order to exercise their individual rights.
- The private sector needs access to information sources of the public sector in order to offer new services and products by adding specific value to existing basic information, for instance through the creation of packages tailored to particular purposes or groups of users (e.g. custom-tailored information products to manufacturers or various industries based on patent registers).

Which route public information policy should take is a very delicate matter. Two main goals have to be taken into consideration and to some extent need to be reconciled when regulations concerning access are decided upon: on the one hand the more economic goal to foster the development of an information market and on the other hand the democratic principle of a 'transparent' society, which would imply to make public information available in a timely and equitable manner to all.

For an information market to develop it is necessary that the enormous amount of data and information produced and collected by public organisations can be utilised by firms and organisations to create commercial products and services.¹³ Another aspect is that public agencies themselves may have an interest to participate as active players in the emerging information market and wish to ensure revenues from the electronic supply of public information. Since the public sector is a large producer of 'content' such an interest in commercialisation is a realistic option. On the other hand, in view of the demands to foster the principles of a democratic society, universal access to public information for all citizens at affordable costs is regarded as essential. Apart from guaranteeing information access for all citizens on a fair basis, information policy has to face at least one further problem, that is to avoid a distortion of normal trading conditions when the public sector becomes a commercial actor on the information market.¹⁴

After all, these are largely divergent demands and interests which represent a special challenge to the formation of policies and the design of appropriate frameworks concerning access to public information. At the same time the creation of an information market requires some sort of guidelines for the utilisation (i.e. adaptation and processing) and commer-

¹² A comprehensive administrative reform programme ("VIP – Verwaltungsinnovationsprogramm") has been started by the Federal Government of Austria on 3 December 1997. In March 1998 an E-government initiative has been launched following a strategy document on Austria's path towards an Information Society.

¹³ Data representing marketable information or from which information products can be created comprise, above all, most kinds of statistical data, especially on economic and financial activities and geographical data. These types of information assets are mainly interesting for specific groups such as businesses and lawyers. A different type of data is what is called „citizen information“, i. e. information on rights and obligations of citizens as well as materials enabling an assessment of the performance of the political system.

¹⁴ An example of an actual conflict of this kind in Austria is the one between a private firm selling information products on legal matters and the law information system offered by the Austrian Federal Chancellery to the public on the Internet for free.

cial exploitation of government-produced raw data as well as other kinds of information.¹⁵

All these aspects mentioned above have been part of a quite long discussion process which finally led at the beginning of 1999 to the publication of a green paper by the European Commission on public sector information in the Information Society. It remains to be seen in which way this document stimulates considerations of regulatory actions which would be necessary to remove the present insecurity in this field.

At present, a comprehensive legal framework on access and use of public sector information, including its electronic form, has not been established in Austria. A statement of the Austrian constitutional law service (which is located at the Federal Chancellery) differentiates between the active and the passive information distribution by the state [13]:

- active information distribution comprises on the one hand information to be spread as announcements (e.g. press releases, strategy papers, white Papers, legal regulations) and on the other hand information, which is collected for internal purposes but also may be made available to external users (e.g. geographical, demographic, economic data).
- passive information distribution concerns information, which has to be provided to the public on request (e.g. environmental data, performance indicators, personnel data, internal policy documents, correspondence, management reports).

In legal terms the supply of information by the public administration in Austria is based on two pillars: the Federal Constitution law (“Bundesverfassungsgesetz”) and the law specifying the principal obligation to information (“Auskunftspflicht-Grundsatzgesetz”). The Federal Constitution law (last version 1987) says that the public administration is obligated to make information available to citizens on request if it does not concern certain restricted data (e.g. on national security issues). The “Auskunftspflicht-Grundsatzgesetz” specifies the information obligation of administrative departments on state and local level, while the information obligation of the federal administration is regulated in the federal ministry law (“Bundesministeriumsgesetz”). Further legal provisions for access to public information are in the copyright law and in the draft federal statistics law.

(2) Still missing is *regulation concerning usage fees for electronic services*. This is currently discussed with a focus on the use of public information but the question also applies to the case of transaction services.

Public administration departments are confronted with a rising demand for information provision, but at the same time they have to face budget cuts. This situation often leads to considerations regarding the question of user charging. One consideration is to charge the recipient a fee in the case of information which is of specific use to him or her (i.e. it goes beyond basic needs). However, it shows that a definite distinction between basic needs and added value is simply not pos-

¹⁵ One recent example for the regulation of intermediary services in Austria is the provision of the land and the business register on the Internet through accredited clearing houses.

sible. Therefore this approach eventually requires a political decision. It is also possible to charge different fees by distinguishing user groups (e.g. foreign or commercial users).

Legal regulations usually treat the question of fees only in respect to coverage of costs resulting from the supply of information. The possibility of gaining revenues is not in their perspective. Because certain instruments are required for the processing of fees, there has to be clarified whether the revenues significantly exceed the expenses at all.

Public administration departments considering fees must check whether there is a legal basis for the charging, whether they are allowed to make profits and in which way such revenues can be spent. Another possibility is to transfer the collection of charges to other departments or agencies which are better suited for such tasks [14].

In Austria the charging of electronic requests was abolished by a recent amendment of the law on administration charges (“Gebührengesetz”).

(3) One of the most important areas in which regulation is needed in the very near future is *electronic signatures*. Electronic transactions between government and citizens or businesses do not really seem to be feasible without a framework and infrastructure for a legally binding equivalent to a handwritten signature. While a directive of the European Union on a common framework for electronic signatures is in preparation, some member states already do foster the development of applications with electronic signatures as an integral part through generous funding of pilot projects, e.g. the MEDIA@Komm competition in Germany or similar initiatives in Denmark.¹⁶ An overview of regulatory developments in European Union member states is given in the draft EU guideline on electronic signatures; a world-wide overview is provided by [15]. In Austria a federal law on electronic signatures, which anticipates the provisions of the expected EU directive, passed parliament on 14 July 1999 and will come into force on 1 January 2000.

Datakom Austria is prepared to act as a certification authority for digital signatures (“A-Sign”)¹⁷ and also the banking sector runs a project on the establishment of a Trustcenter (“A-Trust”).¹⁸ It is planned to rely heavily on the existing infrastructure of bank branches and post offices for registration and distribution of chip cards storing digital signatures.

VII. CONCLUSIONS

While strategy documents for electronic government initiatives have been elaborated in many countries, it is a big challenge to translate such plans into operational and coherent strategies across levels of government and departments.

¹⁶ In Germany the federal Ministry of Education, Science, Research and Technology (BMBF) is funding the development of digital signature applications in city administrations with 60 mio DM (see <http://www.dlr.de/IT/MM/media@komm>). In Denmark the Ministry of Research and Information Technology is funding pilot projects on digital signatures by public authorities (central government, county or municipal authorities) with a total amount of 10 mio DKK (see <http://www.fsk.dk/fsk/div/digital/english.html>).

¹⁷ <http://a-sign.datakom.at>

¹⁸ <http://www.e-sign.at>

Not seldom the implementation is rather characterised by a combination of loosely or even uncoordinated individual or departmental initiatives than by projects following a common stringent plan or standardised rules. Although a modern understanding of governance is not restricted to the model of a central steering agency, the search for effective forms of coordination in the implementation of electronic government initiatives is quite obvious.

Austria is just one example here: The use of ICT in public administrations has reached an advanced level and also the extent of electronic information offered by the public sector to citizens and businesses has grown considerably, especially during the nineties. In certain areas including electronic land register and electronic legal information Austria even finds herself among the leading group of countries. A specific vision of government reform has been formulated on the national level in which the use of ICT plays a key role. The required technological infrastructure has to take into account the convergence towards the Internet as key platform and the necessity to safeguard adequate access possibilities for all citizens. Main organizational challenges are the practical realisation of the one-stop service principle as a means to improved service quality on the one hand and the successful response to several coordination requirements. The very structure of the political system (relative autonomy of government departments) and the necessary transformation of traditional styles of ICT use in the public sector do not generally represent favourable conditions to the practical implementation of coherent electronic government strategies. A distinct area of new challenges are regulation issues: while progress has been achieved with the passing of an electronic signature law, there is still a rather urgent demand for policy formulation and regulations concerning ownership and use of public sector information as well as pricing of public electronic information services.

For all countries implementing e-government there are also tensions between the goals of cost reduction and efficiency gains for the public sector on one side and the goal of a non-discriminative or inclusive service policy embracing all citizens, on the other which have to be managed. The latter goal implicates parallel structures of electronic and traditional service provision for social inclusion purposes. In general such a double supply sets limits to achievable cost reductions. The two goals can, however, be reconciled to a certain extent if the agency in question manages to use synergies between electronic and traditional forms of provision (e.g. by way of rationalising the traditional production of printed information along with the introduction of electronic services).

How and to what extent these conflicts can be balanced are still largely open questions and remain to be answered by analysis and evaluation of practical tests.

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