

The Development of E-Government and the Reforms that Made it Possible: The Case of Estonia

Introduction

During the second half of the 1990s, as the number of people using internet in Estonia began to grow exponentially, it became increasingly obvious that it would change the way that people communicate, find, and access information. It didn't take long for the public sector to see the Internet as medium with enormous potential for providing access to almost any public information or service for anyone at a place and time of their choosing. This paradigm shift in the public sector became known as e-government.

Some fifteen years later most people in Estonia as well as the rest of the developed world take some aspects of e-government initiatives for granted, but it has also become increasingly clear that different countries are at different stages of developing their e-government solutions.

Because of this disparity the evolution of e-government is usually divided into 4 different stages (Baum and Di Maio 2000), which indicate to what extent the properties of information technology have been utilized to enable the delivery of various services electronically. E-government initiatives do not necessarily have to start from the first stage or work through all the different stages consecutively. Almost any project can skip some stages, either from its inception or as it develops. These four stages of development are: presence (or information), interaction, transaction, and transformation

The first stage of e-government development – presence - represents the simplest and least expensive e-government solution. A typical example is a basic website that lists some information about the agency such as mailing address, phone numbers, list of personnel, but lacks any interactive capabilities. The second stage of development is interaction. At this stage agency websites begin to offer limited interactive capabilities that are simple and usually aimed at avoiding a visit to a physical office. This usually involves instructions for obtaining services, forms that can be printed and sent in by mail, and even an e-mail address or two to respond to simple questions.

Transaction is the third stage in the evolution of e-government and initiatives at this stage enable clients to complete entire tasks electronically at a time and place of their choosing. Good examples of this stage of development are license renewals and the paying of taxes or fees online. The fourth and last stage of development is transformation. At this stage initiatives have robust customer management capabilities to deal with a full range of questions, problems and needs. There are very few examples of such initiatives because of the technical, administrative and fiscal limitations, but initiatives at this stage seek to remove organizational barriers and promote customer-centric solutions by facilitating a seamless flow of information required for collaborative decision-making.

This paper will presume that the first two stages of e-government are of limited interest due to the simplicity of their implementation as well as their fairly wide application by most governments. Instead the focus will be on the third and fourth stages by elaborating some of the various initiatives presently at these stages in Estonia.

In the first section of this paper an overview is given of the educational and technological conditions in Estonia before the implementation of e-government reforms. The second section will focus on the specific underlying ideas and principles of the Estonian e-government project, while the third section considers some of the obstacles to reform in Estonia. The fourth section will look in greater detail at some of the more successful initiatives with the fifth section providing some advice to potential reformers before concluding with some final remarks.

E-government is here to stay as most citizens are increasingly relying on e-government solutions to provide them with services accessible from any place and time. Hopefully this paper will guide people interested in implementing e-government by providing an overview of the development of e-government in Estonia.

1. Highly educated people and ancient telecommunications infrastructure

One of the more interesting side effects of Soviet occupation of Estonia was that Estonian institutions of higher education were not allowed to offer too many courses in philosophy or the social sciences. This meant that more emphasis was placed on natural sciences such as physics, mathematics, chemistry, and various branches of engineering (Levine, 2004).

Limits and restrictions on what and to whom could be taught in the social sciences usually ended up guiding promising potential students toward less ideological fields of study related to engineering such computer science, cybernetics, and information technology. In addition, the emphasis on theoretical teaching in these fields meant that the focus was on basic principals that rely more on mathematics and physics not concrete technical applications (Högselius 2005).

By the time Estonia began to move toward independence in the late 1980s the previously mentioned Soviet influence on higher education had caused a situation, where a significant part of the people in charge of coordinating and planning the various activities of this small Soviet republic had engineering backgrounds. This was also fertile ground for a technocratic elite that understood the importance of technology and technological solutions for economic growth.

Enthusiastic technocrats also played a significant role in updating the Estonia telecommunications infrastructure that would lay the ground work for adaptation of various internet based solution, IT businesses, and eventually e-government initiatives.

Modernization through concession

Even before Estonia regained its independence from the Soviet Union in 1991 it had become clear that the institutions of a totalitarian regime would not be suitable for a democratic and market orientated country. About seven months before Estonia officially regained its independence the foundations of e-government were already being laid with the liquidation of the Soviet era Ministry of Communications.

By the late 1980s it had become obvious to top officials in the Ministry of Communications that most of the telecommunications equipment and infrastructure in the Soviet Union was outdated. The anticipated institutional changes would, however, allow for new and advanced technologies to be utilized in the local telecommunications network.

A new Communications Law, which was adopted in January of 1991, paved the way for ever closer cooperation with foreign firms - mainly telecommunication firms from Finland and Sweden - that led to a schooling agreement with Sweden where-by Estonian telecommunications engineers and administrators could acquire more detailed understanding of West European telecommunications technologies. This ever closer cooperation eventually led to the creation of a new company - Eesti Telefon - to administer the Estonian telephone system with 24,5 per cent of shares held by Sweden's Televerket, another 24,5 per cent of the share held by Finland's Tele, and the other 51 per cent belonging to Eesti Telekom which was itself privatized in 1997.

The creation of Eesti Telefon was directly related to the Concession Agreement according to which the trilateral joint venture was awarded a monopoly license by the government of Estonia in 1992 for fixed voice telephony services until the end of the year 2000. In return the Nordic partners were obligated to invest in the modernization of Estonian telecommunications infrastructure – a ten year investment program worth \$25 million annually was launched, to cover the installation of 30 000 digital lines each year. However, the Concession Agreement did not extend to the fields of mobile telephony nor data communications (Högselius 2005).

2. The Preconditions and Development Information Society in Estonia

Estonia began to gain a modicum of autonomy from the central government in Moscow in the late 1980s the two largest higher education institutions in Estonia - Tartu University and Tallinn Technical University - made their first attempts to connect to the Internet, which at this early stage consisted mainly of e-mail and newsgroups.

The first outside connections were limited in their capacity, but as the Concession Agreement was signed in 1992 and the first significant telecommunications infrastructure renewal projects were launched data transmissions began to garner some interest. EsData, the first Internet service provider in Estonia, was established in 1994 and while its main customers were initially subsidiaries of large Finnish and foreign firms in Estonia interested in high quality data transmissions, they also offered dial-up Internet access. At this time there were a mere 400 Internet connections in the whole of Estonia and the World Wide Web was just beginning to emerge.

By the early 1990s it had also become clear that in the coming years only information societies could more or less guarantee prosperity for their citizens. To this end the first information society strategy document "Estonia's Road to an Information Society" was drawn up in 1994. The document was inspired to a large extent by developments in the EU as well as the US, where infrastructure issues were taking centre stage (Kalvet 2007).

Which came first – the strategy or the solution?

One of the more important policy documents "The Principles of Estonian Information Policy" was ratified by the parliament in 1998 and emphasized the importance of modernizing legislation, supporting the private sector, and raising awareness of issues associated with an information society. Subsequent versions of the same policy document prioritized the continuing development of the e-state and the 2004-2006 version singled out the importance of e-government solutions on all levels of government along with schooling and the raising of awareness on ICT issues. Some of the more specific activities planned for the 2004-2006 period included the development of ICT solutions suitable to the advancement of e-democracy, raising the efficiency of the public sector, improvement of digital literacy through e-learning as well as the improvement of Estonia's reputation as an e-state (Principles of Information Policy 2003).

All political parties in Estonia are in agreement on the objective of turning Estonia into successful information and knowledge-based society. However, connections between political rhetoric and concrete actions are even in the best of cases extremely unclear, if they exist at all. Political support has been essential in guaranteeing the necessary regulative environment and the implementation of certain technologies, but this has almost always been preceded by heated political discussions and debate.

Several innovative solutions have been implemented in the public sector, but it's not exactly clear whether these solutions have been developed based on policies and strategies or whether the solutions would have been implemented either way with policy documents ratified after the fact.

One of Estonia's leading ITC and e-government researchers Tarmo Kalvet (2007) has pointed out that one can observe a very pragmatic approach to e-government in Estonia, but the connections between strategy documents and actual developments can best be described as "strategies based on development" rather than "development based on strategies". None the less the importance of educated people interested in modern technological solutions to improve the quality and nature of services through the use of ICT should not be underestimated.

3. Opposition to “exclusive rights” and overcoming the Competence Obstacles

Signing of the Concession Agreement on 16 December 1992 awarded a monopoly license to Eesti Telefon for fixed voice telephony services in Estonia. The agreement was the result of a preparatory negotiations period that had started in 1990, but was severely complicated by the lack of a constitution and a convertible currency until June 1992 (Högselius 2005). In addition most of the national legislation was in a highly fluid state and from the end of 1990 until the end of 1992 three different Estonian governments held office. It was the last of these governments, lead by Prime Minister Mart Laar, that turned out to be the most sceptical of an agreement that would grant “exclusive rights for”

almost a decade. After intense lobbying during the last months of 1992 the agreement was signed, but not by the Prime Minister as originally planned.

One of the main arguments for the Concession Agreement had been the modernization of Estonian telecommunications infrastructure. Once the agreement was signed the government usually took a critical stance toward the pace of modernization and expansion of telecommunications infrastructure making it increasingly difficult for the company to get approval for its business plans. Eesti Telefon was by no means a popular company among the population that wanted modern services now not two or five years down the road. The constant criticism was also echoed in political circles where the Minister for European Affairs eventually resigned in 1996 citing among other reasons what he regarded as "a policy of monopolism in the telecom business" (Högselius 2005).

Eesti Telefon was forced to rewrite its three-year business plan for the period 1997-1999 to get the approval of the government. The new plan resulted in a faster pace of modernization with the number of digital lines added annually raised from 30 000 to 50 000 annually. This meant that the investment requirements set down in the Concession Agreement in 1992 of \$25 million annually were almost doubled.

The unanswerable "what if?"

The Concession Agreement also had defenders whose main argument was that the "exclusive rights" were temporary and that there would eventually be free competition, but before that can happen modernized and expanded infrastructure needs to be in place. While this argument is a substantial one and should not be brushed aside lightly, there are some indications that the investments necessary for telecommunications infrastructure modernization would have been made even without the Concession Agreement.

An interesting argument against the Concession Agreement is the development of mobile telephony in Estonia. Free entry and competition in mobile telephony resulted both in new and innovative services as well as substantial investments into infrastructure. Granted, the installation of fixed telecommunications infrastructure is more expensive and the need to modernize was urgent, so the choices of Estonian governments should be viewed as those made under uncertainty, where specific outcomes were politically desirable. Also, the importance of the emerging Internet could not be foreseen just as its possible role in driving investment into telecommunications infrastructure could not be foreseen.

Even though the Estonian telecommunications infrastructure was being modernized at an increasingly fast rate and internet-based services - especially in the banking sector - were among the most innovative in the world, most government agencies remained passive when it came to changes in legislation. It wasn't until the middle of 1997 that the government became increasingly aware of the need for changes in legislation that would accommodate the growing importance and possibilities of the Internet.

New Laws for a New Age

There first few steps in providing a legislative framework for future Internet-based government services was taken in 1997 with the Databases Act which provided procedures "for possession, use and disposal of state and local government databases" (Database Act 1997). This was followed by the Official Statistics Act (1997) a few months later, but both of these laws also initiated several process that lead to systematic consideration of security issues, which lead to the Digital Signature Act (2000) as well as the Public Information Act (2000) - significant for its provisions on electronic access and disclosure of information. This meant that government agencies now had a duty to maintain websites and were obligated to insure that the information was neither outdated nor inaccurate. In addition e-mail requests for information had to be treated as official requests for information for the first time.

By the time the Public Information Act took effect in January 2001 almost all government agencies had websites and under the guise of various e-government initiatives was already implementing various third stage projects that would allow for transactions.

One of the more significant obstacles for the development of an Information Society is the lack of competence. To remedy this lack the Estonian ambassador the United States in 1995, Toomas-Hendrik Ilves, proposed simple idea: equip all Estonian schools with computers and there-by take a big leap into the information society. The idea was supported by the Minister of Education, Jaak Aaviksoo, and gained momentum as the use of Internet began to grow unexpectedly rapidly (Högselius 2005). This computerization project was officially announced in February of 1996 under the name of Tiigrihüpe or Tiger Leap.

The project enjoyed wide ranging political support and relied extensively on the participation of the private sector with almost 40 companies and private persons supporting the program in one way or another, most of them leaders in their fields in Estonia. As schools were computerized the focus of the Tiger Leap program shifted from all schools being computerized to getting access to the internet as well as providing teachers with training in IT subjects. A follow-up project in 2001 - Look@World - focused on providing basic training on the use of the Internet for any interested Estonian. Curiously enough this project was supported among others by most of the larger Estonian banks (Högselius 2005).

4. The Role of Private Companies in Securing Successful E-Government Solutions

A significant force in driving the development of e-government in Estonia were Estonian banks. As mentioned in the previous section the banks were not simply purveyors of financial services, but also active participants in schooling and training Estonians in the use of computers and the Internet through the Look@World project. Active participation by the banks was to a large extent driven by various electronic banking solutions that proved to be both innovative and popular among users - a development that can be

attributed to fact that banking in general was only some five years younger than the first (offline) electronic banking solution introduced in 1993 (Lushtshik 2003).

As Estonian banks were still setting up their businesses and building out a network of branches, the service at these branches was still often limited by Soviet mentalities that placed little emphasis on customer service. In addition, the lack of branches in the more remote locations as well as the deficit of qualified personnel made alternative ways of organizing banking attractive not just to the banks but customers as well.

The first Internet banking solutions were offered by two Estonian banks in 1996 and shortly there after several other local banks followed suit (Kerem 2003). Since Internet banking services were under constant development the services became increasingly sophisticated and eventually several banks began to set up partnerships with other service providers. The banks had the necessary interfaces for authorizing secure access and transfer funds while their partners (mobile phone operators, energy companies, vehicle insurance providers etc.) usually had a large customer base interested in paying their bills from the convenience of their own home rather than a crowded branch-office.

It didn't take long for the public to notice that while almost all financial transactions could be performed over the internet you could not pay even the simplest of taxes electronically. The Tax board sensed a clear demand for services that allow the submission on income tax declarations directly over the Internet. Work on the e-Tax Board began in 1999 and the first 12 000 individuals submitted their income tax declarations over the Internet in 2000. Later that same year the e-Tax Board was opened up to businesses. Three years later almost 50 per cent of all tax declarations were filed electronically (Högselius 2005).

Importance of Authentication and Identification for E-Government

One of the more unique aspects of the e-Tax Board was its customer identification and authentication solution that relied on existing solutions developed by banks. There was no public sector equivalent for an authentication method as secure and widespread as those of the banks, so the Tax Board decided that because of the popularity of internet banking the simplest way to provide secure access to the e-Tax Board would be through the authentication solutions of internet banking solutions. This meant that to gain access to the e-Tax Board you had to log in through your Internet bank and you would be redirected to the e-Tax Board where your pre-filled income tax declaration was waiting for your confirmation or corrections.

The identification and authorization competence that the banks had accumulated during the development of their various internet banking solutions played a significant role in guiding the development of Estonian Public Key Infrastructure (PKI) - indispensable for enabling computer users without prior contact to be authenticated to each other.

First investigations into PKI and electronic identification in Estonia were made in 1994 and 1996 by the Institute of Cybernetics. However, as the technology was not yet mature nor the public ready to use such authentication solutions, it faded into obscurity. The idea

was revived in 1997 when the Citizen and Migration Board floated the idea of a new identification document, something more convenient than a passport (Certification Center 2003). A formal ID-card project proposal was presented a few months later by a private IT developer and one of the largest banks in Estonia.

The following year the concept was presented to the wider public and preparations for a pilot project began that was launched at the end of 1999. It should be pointed out that while during the initial development phase the ID-card project consisted of two projects - a new identification document and PKI for electronic authentication - the two projects were merged into single solution only during the final stages of the project, when in 2000 the Identification Document Act came into effect and the following year the Digital Signatures Act was ratified. It's at this point that interest in PKI among Estonia's two largest banks SEB and Hansabank as well as the largest telecommunications companies Eesti Telefon and EMT lead to the creation of Certification Centre - a private company that would eventually issue, manage and renew electronic certificates for all Estonian ID cards (Certification Center 2003).

The first ID cards were issued to the general public in the first half of 2002, while the first digital signatures were given at the end of the same year. Initially used mostly as a convenient travel document by most Estonians, the authentication possibilities of the ID card have slowly but surely gained a wider use. By the end of March 2008 more than 991000 Estonians or about 80% of the population had ID cards, roughly 4,3 million digital signatures had been given and 7,3 million electronic identifications made (ID.ee 2008).

Information Age Infrastructure leads to Innovative Services

The three prerequisites of telecommunications infrastructure modernization, ID cards with electronic authentication and identification for higher security as well as changes in legislation necessary for an information society, were all implemented successfully enough to enable interesting developments on the solutions side. Some of the more important of these solutions were:

- E-government portal - The Databases Act of 1997 made the interconnection of various databases easier from a legal standpoint. In the course of the project "Direct Government" a common access point for Estonian government agencies and constitutional institutions were created through the domain riik.ee (gov.ee) in 1998 (RISO 2005a). During the following years the domain became an inseparable part of Estonian e-government and has been under constant development ever since even though unfortunately this is not reflected in the user interface.
- X-road - During the use of various databases by public sector organizations it became increasingly clear that a lot of the information was being duplicated in different databases leading to time wasted on inputting existing data. X-road project was proposed in 2000 for the modernization of databases with the aim of changing them into a public service-rendering resource, which would enable

agencies, legal and natural persons to search data from national databases over the Internet, provided they are entitled to do so (RISO 2005b). While similar schemes had been proposed in Europe they were usually hindered by legal uncertainties. In Estonia the Databases Act of 1997 resolved the issue. The first version of X-road was launched in late 2001 (Högselius 2005).

- e-Tax Board - launched in late 2000 the e-Tax Board has become one of the most popular e-government services in Estonia. While in 2001 only about 9 per cent of income tax declarations were made online the number has reached more than 80 per cent of Estonians in 2006 (Estonian Tax Board 2007). During the last couple of years the e-income tax declaration has been constantly developed and is now pre-filled with refunds transferred within 5 days of the submission of the declaration.
- "Today I Decide" portal - the success of e-Tax Board inspired the development of further public services the first of which was "Today I Decide". The service addressed the ability of Estonians to participate in the state's decision-making process by allowing anyone to submit ideas and comments on draft legislation or even propose amendments to existing legislation. Portal users could monitor the progress of law making, receive feedback on their proposals or comments from ministry responsible. Despite the service receiving a European Commission e-government prize at a conference in Brussels in 2001 (Vallner 2002), the portal has not gained traction among most Estonians and even in 2008 there are less than 7000 registered users – required for commenting or proposals.
- e-voting - the first proposals for e-voting were made in 2001 and strongly supported by Mart Laar, the Prime Minister of Estonia at the time. Initial analysis of e-voting possibilities concluded that both the technological as well as social hurdles made the project too risky for implementation during the next few years. However, the legislative questions associated with e-voting were integrated into several election laws (local, country, EU parliament) and debated during 2002 (Drechsler 2003). In the end ID-card based e-voting over the internet was delayed until the local elections of 2005, when slightly more than 9 000 or about 1% of eligible Estonians voted electronically. During the parliamentary elections of 2007 - about a year and a half after local elections - almost 5,5% of Estonians voted over the Internet (OSCE 2007).
- Company Registration Portal (CReP) - the project was initiated in 2006 and launched in early 2007 with the aim of allowing the registration of new companies online by anyone with the Estonian ID card. This meant that instead of a week, a new legal entity could be created in as little as 12 minutes without leaving home (Epractice 2007). Additionally, CReP provided entrepreneurs with the possibility of handling all communication with the Commercial Register through the portal without paperwork. During the first four months 25 per cent of new companies were registered through CReP and that number continues to increase. It's also worth mentioning that the World Bank's "Doing Business

Survey" ranked Estonia 53rd in starting a business in 2007, but 20th in 2008 (World Bank 2007).

The six e-government solutions presented above are but a sample of some of the more prominent ones developed and adapted in Estonia. All of them can be classified as late third stage of early fourth stage in the evolution of e-government in Estonia, and their development has by no means ceased.

During the last few years the focus has shifted somewhat from service- and organization-centric solutions to citizen centric solutions where more emphasis is placed on convenience, usability, and participation by the general public. Unfortunately this has neither lead to better user interface design for existing services nor been seriously considered during the development of new services. Interestingly enough the use of open standards – where possible – has lead to some interesting initiatives from private individuals, rather than government agencies.

5. Suggestions and Ideas for Reformers

The fact that e-government will be increasingly important in the future has not gone unnoticed by most governments. However, this does not mean that there is a clear understanding of what services a true e-government should provide online and how. This is evidenced most clearly by the various e-government surveys. For example the "UN e-government survey 2008" ranked Estonia 5th in Northern Europe and 13th in the World and the Economist Intelligence Unit's "The 2007 E-Readiness Rankings" ranked Estonia 1st in Eastern-Europe and 28th in the World. Meanwhile Capgemini survey "Online availability of Public Services" ranked Estonia 2nd in Europe after Austria which contrasted sharply with Brown University's "Global E-Government, 2007" survey, where Estonia came in at a humble 128th. The uncomfortable fact is that there's plenty of room for different interpretations of what the most essential elements of e-government are.

The development of e-government in Estonia has been a constant process that has proved to be as successful as it has due to several different factors, not all of them planned. The location of Estonia close to Finland and Sweden, the orientation toward engineering in higher-education under Soviet rule as well as the emergence of the Internet as a significant force for change in the second half of the 1990s all played a significant role. However, there are certain policies and priorities that Estonia pursued that might be of use to reformers interested in accelerating the development of e-government in their country:

1. Before anything can happen the telecommunications infrastructure has to be in place. While people can learn to use various services simply by trying them out, there is no substitute for a robust telecommunications infrastructure. Incentives and competition in a suitably flexible regulatory framework should be preferred, but it bears emphasizing that a modern telecommunications infrastructure is a prerequisite for everything else.

2. Once the infrastructure is in place the early adaptors will start using the possibilities of this new infrastructure. Early adaptors usually constitute a small minority of the population, so schooling and training programs relating to the use of ICT should be considered. In most cases the largest beneficiaries of training programs are students and the elderly – two groups that rarely have access to the latest technologies.
3. Private initiative should be encouraged and the competence available in the private sector should be utilized to its fullest. Local actors are usually better informed about the cultural, economic and educational background of the potential users (their customers!) and therefore able to utilize local knowledge to overcome obstacles, solve and in some cases foresee problems. The inclusion of private sector organization as partners in schooling and training programs should also be considered.
4. There are limits to what central planning by a single government agency can achieve. Action is often preferable to planning since it provides direct feedback into the development process by revealing unforeseen problems and obstacles. Since starting with even small initiatives builds competence there is also no reason to prefer huge all encompassing projects to smaller projects that can gradually be built upon later.
5. Different departments have different leaders with unique visions on how services could be developed further. Decentralization should be preferred to avoid turf wars between government agencies and allow them the freedom to direct the development of their own systems as long as interoperability with other e-government solutions is guaranteed.
6. Open source solutions and standards should be preferred where possible. In addition to providing transparency they encourage participation by the public in developing services on existing solutions. The number of services developed by private individuals and companies across the globe is increasing daily and several of them can be used to provide innovative solutions ranging from reorganizing available information to aggregating information in new and novel ways.

The last of these suggestions is becoming increasingly important in Estonia, where private individuals as well as companies are taking the initiative on smaller projects that build on existing solutions. For example the ID card is already successfully used as an electronic ticket in public transport with solutions on the way for allowing both theatre, concert, and zoo tickets to be purchased online and tied to an ID card there-by avoiding any physical tickets. The use of ID cards by companies as loyalty cards is another interesting development.

There are at least two interesting solutions that have been built on e-services by private individuals. In one case the electronic State Gazette (publishes all legislative acts), which

is notorious for an inadequate search features and interface design, received a more user friendly interface as wLex from Peeter Mõtsküla based on an open source solution wLex.

In the second case proposals from the "Today I Decide" (TOM) portal were integrated into the social bookmarking site del.icio.us by Peeter Marvet. This particular solution tags all TOM ideas to show clusters of relevant policy issues. While these two examples are by no means an e-government solution they are potential trendsetters and provide a general idea of what is possible, if individuals can build on existing solutions.

Conclusion

Just as most people are unique, so are the countries they live in. The initial conditions, local culture, fortunate coincidences, and luck often play an important role in the development of government policy. In that sense e-government and the policies that enable it are no different.

The Estonian experience in developing e-government solutions has shown that while some success is usually determined by people interested in change and willing to act to achieve this change, a lot depends on initial conditions and how free people are to take advantage of them. A single vision or plan might guide the various stake holders in developing their solutions, but its also increasingly obvious that grand visions should leave plenty of room for the modest visions of the implementers, who can come up with novel solutions to difficult problems if unconstrained by detailed directions.

In Estonia the development of modern telecommunications infrastructure along with wide ranging training and schooling initiatives provided an excellent base on which Estonia's e-government could be built along side the more traditional embodiments of government institutions. The skills, knowledge, and contacts available in both the public as well as private sector were utilized with all involved realizing that an ICT literate populace would benefit everyone.

Even the more controversial elements e-government in Estonia such as e-voting have been accepted in large part due to the fact that e-solutions have always been just one channel among many. E-services are simply one more choice along more traditional channels – be they casting a ballot in voting both or submitting your tax declaration by regular mail.

For the foreseeable future e-government is about choice and convenience not radical transformations of government. Before e-government solutions can transform they need users, who find the online options both convenient, easy to navigate, and relevant. Simple goals that are increasingly difficult to achieve as e-government solutions grow in complexity and more is expected of them.

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