

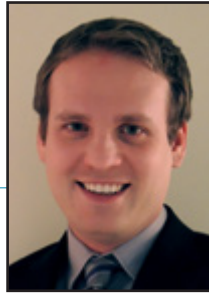


POLICY SERIES

NO. 148 • MARCH 2013
FRONTIER CENTRE FOR PUBLIC POLICY

The Future of E-Government in Saskatchewan

Jan Pavel



About the author

Jan Pavel is a consultant at International Immigration & Business Consulting. Jan holds a Master's Degree in Political Studies from the University of Saskatchewan and a Master's Degree in International Relations & European Studies from the Masaryk University in the Czech Republic. He has written major research papers on topics that include interest group participation in policy making, transparency of lobbying, and the productivity of the public sector. Jan also contributed to research on flow-through shares and investment promotion in bioresearch and in the development of policies for Metis and Non-Status Indian people of Canada. Jan came to Canada as an exchange student and then decided to make Saskatchewan his new home.



FRONTIER CENTRE FOR PUBLIC POLICY

MB: 203-2727 Portage Avenue,
Winnipeg, Manitoba Canada R3J 0R2
Tel: 204-957-1567
Email: manitoba@fcpp.org

SK: 2353 McIntyre Street,
Regina, Saskatchewan Canada S4P 2S3
Tel: 306-352-2915
Email: saskatchewan@fcpp.org

AB: Ste. 603, 734-7th Avenue SW,
Calgary, Alberta Canada T2P 3P8
Tel: 403-995-9916
Email: alberta@fcpp.org

The Frontier Centre for Public Policy is an independent, non-profit organization that undertakes research and education in support of economic growth and social outcomes that will enhance the quality of life in our communities. Through a variety of publications and public forums, the Centre explores policy innovations required to make the prairies region a winner in the open economy. It also provides new insights into solving important issues facing our cities, towns and provinces. These include improving the performance of public expenditures in important areas like local government, education, health and social policy. The author of this study has worked independently and the opinions expressed are therefore their own, and do not necessarily reflect the opinions of the board of the Frontier Centre for Public Policy.

Copyright © MMXIII by the Frontier Centre for Public Policy.

Date of First Issue: March 2013.

Reproduced here with permission of the author. Any errors or omissions and the accuracy and completeness of this paper remain the responsibility of the author.

ISSN 1491-78

The Future of E-Government in Saskatchewan

Jan Pavel

Table of Contents

Title	Page
Executive Summary	4
Introduction	5
What e-government is	7
Origins of e-government	8
Forms of e-government	10
The current status of e-services in Saskatchewan	11
Saskatchewan's comparative standing in e-government	14
Why we need more e-government	19
Estonia's achievements	21
Legal framework and potential challenges	32
Opportunities for e-government in Saskatchewan	34

Executive Summary

Saskatchewan's fast-growing economy and population provide the conditions for unprecedented future opportunities. Despite Saskatchewan's many achievements, the province is falling behind in the implementation of modern technologies in electronic government.

By embracing modern e-government systems, Saskatchewan can facilitate a path toward a competitive and effective public sector, attract investment and potentially create new high-tech industries.

The status of e-government in Saskatchewan is assessed to identify its strengths and weaknesses.

This paper presents information on trends in e-government such as integrated e-services and the One-Stop-Shop Model. Practical examples from Estonia's e-government demonstrate the potential of advanced electronic solutions.

The examination of the Estonian model leads toward suggestions for future changes in Saskatchewan's e-government.

Introduction

Progressive public policies and long-term vision have brought Saskatchewan back to the forefront of economic development. News headlines depict the province as the land of opportunity. Saskatchewan is leading the country in economic and population growth, and it reports one of the lowest unemployment rates in Canada. Saskatoon and Regina are among the fastest-growing cities in the country. The provincial debt is the second lowest in Canada at 11.9 per cent of GDP,¹ and another annual budget surplus is expected in 2012. The provincial credit rating went from A+ 10 years ago to AAA, the highest rating, in 2011. Overall, the economic development is unprecedented. The situation is comparable to the early decades of the 20th century when Saskatchewan's population rose quickly from a few hundred thousand people to one million inhabitants. Responsible fiscal policies, changes in mineral resource management, and support for the entrepreneurial spirit of the Saskatchewan people have helped to reignite the economy and create an enviable momentum that will likely last for years to come.

Progressive policies and long-term vision stand at the centre of this paper. The paper aims to initiate an important discussion about the future of e-government and its contribution to improving the efficiency of the public sector in Saskatchewan at the provincial and municipal levels. E-government or electronic government is a fast-growing practice in the public sector. It utilizes information technologies, particularly the Internet, to deliver and administer services for citizens. E-services save citizens' time, reduce administrative costs and bring a new level of convenience into the citizen-government interaction. During the last two decades, information technologies have become an essential and mainstream part of government service delivery and administration in most developed countries around the world.

Governments enable citizens to access and complete requests for services online, which improve their availability and efficiency. If the potential of e-government is maximized, the efficiency gains can be remarkable. In addition, the quality of e-government has become a telltale sign of effective public administration, which is an important factor for investors when deciding where to spend their money. Governments realize more and more that by introducing a successful e-government practice, they will gain a competitive advantage in attracting foreign investment. In addition, the development and implementation of sophisticated e-government infrastructure often lead to the creation of new industries. Therefore, it is crucial that Saskatchewan and its municipalities continue to build e-government infrastructure in order to maximize cost savings and secure long-term competitiveness.

E-government in its earliest form was largely limited to the provision of information online. Currently, e-government is much more complex, as interactive Web applications permit citizens to complete entire tasks online. Ideally, individual government departments share and reuse available electronic information to avoid duplication in future transactions. Canada has been among the leaders in e-government. However, in recent years, all major e-government rankings show

that it is increasingly falling behind countries such as Singapore, the United States, South Korea, Finland, Denmark and Sweden. E-government in Saskatchewan is not safe from criticism. According to a recent study by the Stratford Institute for Digital Media, the government of Saskatchewan is lagging in its online presence when compared with other provinces and the federal government. This suggests that Saskatchewan's e-government strategy should be revisited and its goals updated.

To maximize the benefits of e-government, service delivery and administration must be integrated across all branches of government. This model of e-government is often referred to as the One-Stop-Shop Model. Its main features are that citizens can manage all their interactions with the government from one personal account on the Web, and the government reuses client's existing information to accomplish future tasks. This saves time for the users and improves the efficiency of government operations. Changes appear in the Web interface but mainly they happen behind the scenes where new pathways are created to enable effective data sharing.

In this paper, we present Estonia as the country that pioneered the one-stop-shop concept in practice. Similar in population size to Saskatchewan, this small European country has distinguished itself worldwide as an IT leader, and it has been lauded by experts and media for its e-government solutions. In Estonia, it is commonplace for people to go online to vote, pay taxes, establish businesses, apply for social benefits, register cars, apply for schools, receive prescriptions or apply for building permits. Citizens and permanent residents have access to a personal Internet account where they can choose from hundreds of e-services. Most of these services are accessible from one place on the Web, and when a user provides information, it is shared throughout the system. We argue that the sheer number of benefits makes integrated e-services and the One-Stop-Shop Model of e-government a smart and feasible option for Saskatchewan.

The structure of the paper is as follows: The first part explains in more detail what e-government means, how it originated and what the forms of e-government are. We review the state of e-services provided by the province of Saskatchewan and its major municipalities. We also present information about Saskatchewan's relative standing in comparison with other provinces and countries. Subsequently, we discuss the main benefits of advanced e-government systems and the reasons Estonia is an excellent source of inspiration for e-government solutions. In the next part, we review Estonia's e-services and the functioning of its e-government. In the final part, a section is dedicated to the potential challenges associated with the implementation of advanced e-government tools. The paper concludes by pondering and elaborating upon the opportunities that an e-government system similar to Estonia's could bring to Saskatchewan.

What e-government is

First, it is necessary to clarify what e-government means. Ten years ago, the term “e-government” was largely unknown. Now, it is part of public policy lingo almost everywhere.² In a very basic form, e-government is the use of information and communication technology (ICT) in support of government operations. Over the years, the definition has expanded to capture the diverse e-government realities. The original emphasis on service delivery is now shared with a focus on service administration and transparency. Alhomod and Shafi provide an example of such a definition: “E-Government involves the use of ICT to facilitate an efficient, speedy and transparent process of providing information to the public and to carry out administration activities.”³

With new research and the expansion of e-government in practice, terms such as “e-governance” and “e-democracy” have appeared. Often, we see these terms used interchangeably, which contributes to confusion about their meaning. “E-governance” can be explained as a group of norms, processes and behaviours that influence the exercise of power, particularly openness, participation, responsibility, effectiveness and consistency. In other words, e-governance is a set of guiding principles to e-government. In “e-democracy,” governments use ICT to provide people with easy access to information and with more opportunities to participate in the institutions and the democratic process.⁴ The nuances between the terms not only make them distinct topics but also improve our understanding of the depth and breadth of the “e-movement” in government.

Essentially, e-government is about a transformation of traditional government. Some claim that it may well be the biggest transformation since the democratic revolutions of the late 18th century.⁵ Researchers and e-government experts promote a holistic approach to the e-transformation. In this context, the features of e-governance and e-democracy often appear under the common umbrella of e-government. J. Ramon Gil-Garcia proposes a holistic definition that includes the following aspects:

“Electronic government is the use of information and communication technologies in government to provide public services, to improve managerial effectiveness and to promote democratic values and mechanisms; as well as a regulatory framework that facilitates information intensive initiatives and fosters the knowledge society.”⁶

It is also possible to provide a much more concise definition: “E-government is the use of information technology to support government operations, engage citizens, and provide government services.” Sharon Dawes, the author of the above definition, argues: “[A]lthough simply stated, it is actually quite broad.” She explains that it incorporates all four key dimensions, which reflect the functioning of government itself:

- E-services—the electronic delivery of government information, programs, and services often (but not exclusively) over the Internet.

- E-democracy—the use of electronic communication to increase citizen participation in the public decision-making process.
- E-commerce—the electronic exchange of money for goods and services such as citizens paying taxes and utility bills, renewing vehicle registration, and paying for recreation programs, or government buying supplies and auctioning equipment.
- E-management—the use of information technology to improve the management of government, from streamlining business processes to maintaining electronic records, to improving the flow and integration of information.⁷

Ambitious but necessary improvements in the four areas listed above are needed to keep up with the trends in public administration, but mainly they are needed in order to enjoy the full benefits of e-government, including creating another competitive advantage for Saskatchewan.

Origins of e-government

There have been several main drivers behind the ascent of e-government: computer technology, cost savings, business modelling and the success of e-commerce. Government operations have used electronic information technology since the Second World War. In 1951, the Census Bureau in the United States purchased one of the first computers to be utilized by the public sector for non-military purposes.⁸ Since then, computers have been valued for their capacity to produce calculations that would otherwise be very time-consuming if done by humans. In later decades, they have also significantly limited the need for paper communication and resolved the problem of where to store growing quantities of government documents.⁹ Although computers have made e-government possible, it was not imaginable until after the advent of the World Wide Web in the early 1990s.

E-government is the latest evolutionary stage in public administration. The continual need to reduce or contain government costs has been one of the main drivers behind it and many previous changes in public administration. It is evident that with each government action, there is a transaction cost. What is more, population growth and the increasing complexity and speed of social and economic activities hinder the ability of the public sector to gather and analyze information, and they lead to increasing transaction costs. As a result, governments are under pressure to collect and use personal data electronically. The conviction is that processing information digitally will reduce costs and enhance convenience, speed, efficiency and accountability.¹⁰ With the electronic revolution, the government looks to the private sector for inspiration for improving its services and administration.

The success of the U.S. economy in the 1990s led the public sector to emulate private sector practices. Reformers used the business model of a firm to reorganize how the government functions. In particular, the transactional part of a business

model was praised for its ability to show how firms provide value to consumers, how that value is delivered and how that revenue stream will support the enterprise. Federal agencies in the United States were required to submit business plans for information technology (IT) projects. The government wanted to go beyond cost-benefit analysis and promote planning that was guided by vision and key business values such as environmental scanning for opportunities, process re-engineering to exploit opportunities and create consumer-oriented delivery systems.¹¹ At the same time, a similar reform movement swept through many other Organisation for Economic Co-operation and Development (OECD) countries including Canada (see box below), setting a new goal of client-centered service. It was to make government more user-friendly by reorganizing itself around citizens.¹²

Client-centered Government— An Early Example from Canada

Human Resources Development Canada placed kiosks in malls across the country in the early 1990s and used them to make available information on employment insurance and job postings.

Kiosks and websites represented an innovative way to deliver services, a method that caught on quickly. The new approach was called ESD—electronic service delivery.

Source: Donald G. Lenihan, Centre for Collaborative Government. "Realigning Governance: From E-Government to E-Democracy." <http://kta.on.ca/pdf/cg6.pdf>. Accessed June 17, 2012.

Finally, e-government was also a direct response of the public sector to the success of e-commerce in the last decade of the 20th century. It was thought that what business models and e-commerce could do for the private sector, e-government could do for the public sector in the upcoming decades. Although it is uncertain whether the success of the 1990s rested in e-commerce, it is evident that e-government has managed increasingly to use this knowledge. It is worth examining one of the e-commerce business models (see box below), as the parallels with the goals of e-government can be clearly identified.¹³

E-commerce Business Model

Amazon.com—the model is to meet consumer demand for books, music, video, and other products by offering consumers an extremely wide range of choices (greater than brick-and-mortar establishments). These choices are available on-line conveniently 24 hours a day, seven days a week. Online payments require consumers only to have to enter credit and shipping information one time to establish an account. Purchasing is made convenient through this one-time entry and through use of a shopping cart metaphor already familiar to consumers.

Source: G. David Garson, Public Information Technology and E-Governance: Managing the Virtual State, (Mississauga: Jones & Bartlett Learning, 2006), 262-263.

Forms of e-government

Ever since government websites started to appear, the ultimate goal has been to create seamless electronic government. It has been about realizing the potential of information technologies to change the government from an agency-centric entity into an automated, citizen-centric operation.¹⁴ The most-cited works on models of e-government predict a linear development from a basic online presence to full integration, seamlessness and transformation. One of the most influential models identifies four stages of e-government: presence, interaction, transaction and transformation.¹⁵ Nonetheless, it is important to note that the development of e-government does not necessarily have to go through all the stages in order to get to the top.¹⁶ Moreover, an e-government system in a particular country can consist of e-services that are at different stages of development at a given time. The stages are:

PRESENCE – Presence on the Web is the most basic and least expensive form of e-government. It distributes information but does not enable any interaction with the government. This form of e-government is rarely seen now, as most government Web sites allow at least e-mail interaction or provide documents to download.

INTERACTION – Websites that enable interaction between citizen and government represent the next stage of e-government. These websites are designed to save users a trip to an office by providing information, downloadable forms and/or e-mail to ask simple questions. Occasionally, governments also collect information by posting questionnaires for users to fill out on a voluntary basis.

TRANSACTION – This form of e-government includes websites that enable online transactions between citizen and government. These end-to-end services are designed to give citizens the option to complete entire tasks from a computer anywhere and at any time. Payment of bills, taxes, and parking tickets, renewing a car registration and applying for a health card can be among such e-services.

TRANSFORMATION – Transformation is the final form of e-government. In this stage, e-government integrates and transforms service delivery and administration to produce the most citizen-centric interface and to benefit fully from the efficiency gains of information technologies. Government departments not only provide an integrated interface with end-to-end e-services but also share information among themselves to avoid duplicating their operations. This stage is typical for the One-Stop-Shop Model of e-government.

The current status of e-services in Saskatchewan

Users of the Saskatchewan provincial services can find information and navigate to the appropriate site and service from the main Government of Saskatchewan Web site (www.gov.sk.ca). This site provides information in three categories depending on the target audience: residents, visitors and business. After choosing one of the categories, users can narrow their search by clicking on one of the related subcategories. These generally link to different government Web sites where users can look up information on how to apply for a particular service.

Services in Saskatchewan are delivered in two main ways. First, a growing number of services are available online and can be completed entirely from a personal computer. As such, these services are examples of end-to-end online services and fall under the transaction model of e-government. Among these are applications for government jobs, PST filing, business registration, employer registration for foreign worker immigration, health card registration, campground reservations, selected provincial operational permits, driver's licence renewal and replacement, car registration, payment of transportation fines and many other services provided by Saskatchewan Government Insurance (SGI). The availability of these services online saves time for Saskatchewan residents and improves the efficiency of the institutions that are offering them.

Saskatchewan business registration is a good example of how e-government can transform itself to create citizen-oriented services. Online business registration integrates several tasks that are necessary to register a new business into one operation on the Information Service Corporation (ISC) website (www.isc.ca). The website allows an applicant to register with the Saskatchewan Corporate Registry, Canada Revenue Agency, Saskatchewan Ministry of Finance and Saskatchewan Workers' Compensation Board in one convenient process.¹⁷ This approach demonstrates how a fully developed integrated model of e-government can function. The process seamlessly interconnects delivery of services from both provincial and federal agencies. Instead of a citizen going to the government to request services, services are brought to the citizen.

Many government services in Saskatchewan are still offered on Web sites with only interactive functions. On these sites, visitors can download the required forms, read application guides or ask questions by e-mail. However, the actual submission is conducted using regular mail or in person. These traditional ways are still required to apply for birth, marriage or death certificates, child care subsidies, property- and land-related services or numerous operational permits. Converting these services into true end-to-end e-services would most certainly improve their convenience for users as well as the efficiency of service delivery and administration.

Somewhere in between online end-to-end services and traditional service delivery, there are applications for provincial student loans and permanent residence for foreign workers through provincial immigration programs. Applicants can fill out the forms online; however, some documents also need to be mailed after the online section is completed. This requirement is mainly due to the need to receive documents with original signatures, a problem that could be resolved by the introduction of an electronic signature.

In addition to looking at the provincial government, this paper also examines how Saskatchewan municipalities use advanced online delivery methods. Although municipalities administer and deliver services separately from the provincial government, future changes in the provincial e-government should allow cities, towns and rural municipalities to become part of the integrated system. There are several reasons why the province and municipalities should co-operate, and increased efficiency is just one of them. In practice, people often need to deal with federal, provincial and municipal levels of government to accomplish a task. Even though a complete integration of services among the three levels of government may be hard to achieve at all times, the new system should strive to bring at least provincial and municipal services together. For example, as shown above, establishing a new business requires registration with different provincial and federal government branches, but it may also require a municipal business licence and various operational permits. Therefore, it makes sense to provide as much of what is needed in one place.

Closer examination of online service delivery by the Cities of Regina, Saskatoon, Moose Jaw and Prince Albert shows that there are practically no end-to-end services available except for the payment of parking tickets. In most cases, their websites post only basic information about particular municipal policies and allow users to download forms. In several cases, the websites do not even go that far and only provide address and phone and/or fax contact information with no option to download or fill out forms.

Overall, the examination of e-services available to people in Saskatchewan indicates some positive trends, as new end-to-end services are regularly added at least at the provincial level. Most recently, the introduction of the provincial parks campground reservation Web site made interactions with the government much easier and likely more efficient to manage.

On the other hand, the main drawback of e-services such as driver's licence renewal, business registration or campsite reservations is that they are all located on different Web sites. Many of us go camping once or twice a year, renew a driver's licence once a year or less, and register a business or renew a business licence infrequently. In short, we do not do these activities very often. Yet, every website where these e-services are located requires the creation of a personal account with a login and password. Taking into account the number of times one needs to access one e-service or another, it is likely that some of the information will be lost or forgotten at the user's end, thus making interactions with the government cumbersome.

If all services were located on one website with one personal account, it would have the potential to become a popular, frequently accessed and easy to use utility for everyone. Information from a personal profile and previous undertakings would automatically be used to accomplish a new task. A predetermined credit card could be used to pay for application or reservation fees. There would be no need to provide the same information each time. In addition, new e-services, not previously envisioned, would emerge, making government-citizen interactions more streamlined and efficient.

Saskatchewan’s comparative standing in e-government

Carrying out major changes in public policy, including e-government, is a complex endeavour that requires broad and long-term political consensus, and it should be a reflection of popular demand. Importantly, in today’s highly competitive world, decision-makers must also be aware of Saskatchewan’s standing in comparison with other provinces and countries. Well-functioning e-government will have positive effects on investment promotion and economic diversification and can facilitate a path toward the knowledge economy.

Despite existing achievements in e-government, Saskatchewan’s overall standing among other provinces and territories is well below average. According to the 2012 study *Becoming a Digital Nation* by the Stratford Institute for Digital Media, Saskatchewan placed tenth, leaving behind only Newfoundland and Labrador, the Northwest Territories and Nunavut. This thorough assessment of e-government across Canada examined provincial and territorial practice in three main areas: online services (Saskatchewan ranked eighth), online information (Saskatchewan ranked sixth) and online engagement (Saskatchewan ranked twelfth). While among Saskatchewan strengths was the provision of sufficient and relevant information on government websites, the examiners criticized the small number of end-to-end e-services, the minimal integration of e-services and the limited options for citizens to ask questions, express opinions or provide feedback.¹⁸

Provincial Standing in E-government

Overall Ranking	Ranking in E-services	Ranking in E-information	Ranking in E-engagement
Ranking	Province/Territory	Province/Territory	Province/Territory
1. British Columbia	Quebec	Ontario	Alberta
2. Alberta	Ontario	British Columbia	British Columbia
3. Ontario	Nova Scotia	Quebec	Prince Edward Island
4. Nova Scotia	British Columbia	Alberta	Manitoba
5. Quebec	Alberta	Prince Edward Island	Nova Scotia
6. Manitoba	New Brunswick	Saskatchewan	Yukon
7. Prince Edward Island	Manitoba	Manitoba	Ontario
8. New Brunswick	Saskatchewan	Nova Scotia	Quebec
9. Yukon	Newfoundland & Lbdr	New Brunswick	Northwest Territories
10. Saskatchewan	Northwest Territories	Newfoundland & Lbdr	New Brunswick
11. Newfoundland & Labrador	Prince Edward Island	Yukon	Nunavut
12. Northwest Territories	Yukon	Northwest Territories	Newfoundland & Lbdr
13. Nunavut	Nunavut	Nunavut	Saskatchewan (Shared 12th position)

Source: http://stratfordinstitute.ca/wp-content/uploads/2012/04/eGovernment_final_web.pdf

On the other end of the assessment spectrum is Quebec, the top performer in online services for its fully integrated One-Stop-Shop Model of e-government. Alberta scored the best in online engagement. The study pointed to Alberta's frequent postings on Facebook and Twitter, where it encourages feedback and creates events to connect with and engage the citizenry. In online information, Ontario scored the best for enabling the most-integrated and citizen-centric provision of information. Extensive use of executive summaries, highlights, quick facts and quotations makes the content more appealing and digestible to the users. Overall, British Columbia obtained the highest combined score.¹⁹

United Nations E-government Ranking 2012²⁰

Country	Model E-Government
1. Republic of Korea	One-Stop-Shop Model
2. Netherlands	One-Stop-Shop Model
3. United Kingdom	One-Stop-Shop Model
4. Denmark	End-to-end e-services
5. United States	End-to-end e-services
6. France	One-Stop-Shop Model
7. Sweden	End-to-end e-services
8. Norway	One-Stop-Shop Model
9. Finland	One-Stop-Shop Model
10. Singapore	One-Stop-Shop Model
11. Canada	End-to-end e-services
20. Estonia	One-Stop-Shop Model

Saskatchewan's standing in comparison with other countries' is unknown, as there are no rankings or surveys that measure and compare e-government at the national level and in sub-national units. To some extent, we can estimate Saskatchewan's standing from the nature of e-government implemented by the leading countries. The tables (on this page) show two widely recognized international rankings of e-government. The United Nations and Waseda University publish countries' relative standings in e-government every second year and every year, respectively. By assessing the countries' progress, these organizations contribute to awareness of the advancement in e-government technologies and help promote the idea of electronic government. Due to differences in methodologies, the results are not exactly the same, yet many of the top performers appear among the high-ranking countries in both lists. The order of countries is subject to rapid change, as countries have in recent years launched new e-government applications in an accelerated manner. Importantly, national e-government initiatives often progress unevenly.

Waseda University E-Government Ranking 2012²¹

Country	Model E-Government
1. Singapore	One-Stop-Shop Model
2. United States	End-to-end e-services
3. Republic of Korea	One-Stop-Shop Model
4. Finland	One-Stop-Shop Model
5. Denmark	End-to-end e-services
6. Sweden	End-to-end e-services
7. Australia	One-Stop-Shop Model
8. Japan	End-to-end e-services
9. United Kingdom	One-Stop-Shop Model
10. Taiwan	One-Stop-Shop Model
10. Canada	End-to-end e-services
19. Estonia	One-Stop-Shop Model

Some countries present excellent One-Stop-Shop Models or end-to-end e-services but fall behind in the provision of additional information or are slow to enable citizen engagement and participation. This also affects the relative standings of countries and explains why some countries with well-designed One-Stop-Shop Models do not score as well as some countries with only an array of end-to-end services. The tables on page 15 show models of e-government implemented by top performing countries in 2012. The tables below show the standings of Canada and Estonia during the past decade.

As the tables show, Estonia does not score as high as the Canadian federal government does in either of the rankings. Yet, it certainly deserves to be at the centre of our discussion. As the following sections will show in more detail, Estonia and Saskatchewan have more in common than just similar population size. They are

United Nations E-government Ranking

2003	2004	2005	2008	2010	2012
1. United States	United States	United States	Sweden	South Korea	South Korea
2. Sweden	Denmark	Denmark	Denmark	United States	Netherlands
3. Australia	United Kingdom	Sweden	Norway	Canada	United Kingdom
4. Denmark	Sweden	United Kingdom	United States	United Kingdom	Denmark
5. United Kingdom	South Korea	South Korea	Netherlands	Netherlands	United States
6. Canada	Australia	Australia	South Korea	Norway	France
7. Norway	Canada	Singapore	Canada	Denmark	Sweden
8. Switzerland	Singapore	Canada	Australia	Australia	Norway
9. Germany	Finland	Finland	France	Spain	Finland
10. Finland	Norway	Norway	United Kingdom	France	Singapore
Estonia (16.)	Estonia (20.)	Estonia (19.)	Estonia (13.)	Estonia (20.)	Canada (11.) Estonia (20.)

Waseda University E-government Ranking

2005	2006	2007	2008	2009	2010	2011	2012
1. U.S.	U.S.	U.S.	U.S.	Singapore	Singapore	Singapore	Singapore
2. Canada	Canada	Singapore	Singapore	U.S.	U.K.	U.S.	U.S.
3. Singapore	Singapore	Canada	Canada	Sweden	U.S.	Sweden	South Korea
4. Finland	Japan	Japan	South Korea	U.K.	Canada	South Korea	Finland
5. Sweden	South Korea	South Korea	Japan	Japan	Australia	Finland	Denmark
6. Australia	Germany	Australia	Hong Kong	South Korea	Japan	Japan	Sweden
7. Japan	Taiwan	Finland	Australia	Canada	South Korea	Canada	Australia
8. Hong Kong	Australia	Taiwan	Finland	Taiwan	Germany	Estonia	Japan
9. Malaysia	U.K.	U.K.	Sweden	Finland	Sweden	Belgium	U.K.
10. U.K.	Finland	Sweden	Taiwan	Germany/Italy	Taiwan/Italy	U.K./Denmark	Taiwan/Canada
N/A	N/A	N/A	N/A	N/A	Estonia (14.)		Estonia (19.)

both up-and-coming economies with the ambition to become the most prosperous and forward-looking places in the world. Most importantly, Estonia’s path from an almost zero IT infrastructure toward a successful development of integrated e-government solutions that are competitive worldwide is certainly a path worth examining and learning from.

In addition, even though the aim of this paper is not to compare Estonia’s e-government with the e-government implemented by Canada at the federal level, a closer look at the UN and Waseda methodologies will do more justice to the quality of Estonia’s e-solutions.

UN Ranking – Methodology

1) Online Service Index (% of services)

- Stage I (Presence)
- Stage II (Interaction)
- Stage III (Transaction)
- Stage IV (Transformation)

2) Telecommunication Infrastructure Index

- Est. Internet users
- Fixed phone lines
- Mobile subscribers
- Fixed Internet subscribers
- Fixed broadband

3) Human Capital Index

- Adult literacy
- Enrollment (in school system)

Source: UN E-Government Survey 2012

The main goal of the UN and Waseda rankings is to provide an all-encompassing picture of how countries are prepared for e-society. To achieve this, both the UN and Waseda University developed a system of benchmarks that determine the final score for each country. Online services are only one of the components assessed (see boxes for the list of benchmarks). For example, the UN determines a country’s score by averaging a score obtained for the quality of online services, telecommunication infrastructure and human capital. According to critics, the inclusion of some benchmarks may even lead to misleading results.²² Therefore, we look into the data behind the rankings and bring forward some additional information on Estonia’s standing.

If online services were the only component considered, Estonia’s position in the UN’s 2012 ranking would improve from 20th to 15th. Importantly, the difference in scores between Estonia and the next eleven countries that ranked better in e-services was between only 2 and 6 percentage points. If the share of the most modern e-services (in the transformation stage) determined a country’s final standing, Estonia would place sixth in the world with 74 per cent. The Canadian federal government scored only 68 per cent for e-services in the transformation stage.

Interestingly, the UN e-government report also includes a ranking for e-participation that is not part of the final score. The E-Participation Index measures how much citizens actually use the electronic services to communicate with the government. In 2012, Estonia placed fifth and Canada placed seventh. The UN methodology gives preference to benchmarks such as total enrollment in the school system before e-participation. In our view, the measurement of participation seems to have more potential to demonstrate how successful e-services are in a particular

Wadesa University E-Government Ranking - Methodology

1) Network Preparedness/Infrastructure

- Internet users
- Broadband subscribers
- Mobile cellular subscribers
- PC users

2) Management Optimization

- Optimization Awareness
- Integrated Enterprise Architecture
- Administrative and budgetary systems

3) Required Interface

- Cyber Laws
- E-Tender systems
- E-Tax system
- E-Payment system
- E-Voting
- Social Security Service
- Civil Registration
- E-Health system

4) National Portal

- Navigation
- Interactivity
- Interface
- Technical

5) Government Chief Information Officer (CIO)

- Presence
- Mandate
- Organizations
- Development Programs

6) E-Government Promotion

- Legal Mechanism
- Enabling Mechanism
- Support Mechanism
- Assessment Mechanism

7) E-Participation

- E-Information and Mechanisms
- Consultation
- Decision-making

country. It is certain that an excellent e-government solution gains its value and brings the benefits only when it is widely used.

As well, a closer look at Waseda's data reveals that in many instances Estonia belongs among the leaders in e-government. For example, in 2010, Waseda's ranking places Estonia fourth in the world for e-services behind the United States, Australia and Canada. In e-participation, Estonia scores sixth and Canada ninth. In 2011, Estonia's great eighth position is accompanied by a shared first with Australia and the United States in e-participation.

Neither the UN nor Waseda methodologies explain how they overcome the differences between federal countries and unitary countries when assessing e-government. E-government rankings do have their limits, and they cannot replace a thorough comparative analysis. Yet, it is evident that the most successful models of e-government integrate end-to-end e-services, provide relevant and ample information and encourage interactive communication. The One-Stop-Shop Model and integration of e-services should thus be the goal of the Saskatchewan government for its public administration. On the one hand, the new system will require systematic and complex changes in service delivery and administration, and on the other hand, it will open numerous opportunities that were previously unthinkable.

Why we need more e-government

As briefly discussed earlier, the impact of e-government is no longer limited to improvements of government-citizen interactions or cost reductions. There are many other reasons why it is important to excel in this area. First, functioning e-government is often associated with openness, accountability transparency, predictability and participation, all of which are indicators of good governance. Strengthening the moral and procedural fabric of our institutions is always desirable. Most importantly, these indicators of good governance also play a crucial role in investment promotion.²³ Saskatchewan companies are seeking investment in many mining, mine servicing, manufacturing and other projects. Saskatchewan also has a large number of small- and medium-business owners retiring, which makes businesses throughout the province available for purchase. Thus, investment attraction should be our priority.

Second, implementation of a sophisticated e-government will bring technological expertise to the province, which can be re-exported and give an impulse to create new industries in Saskatchewan. Countries such as Estonia²⁴ or South Korea²⁵ export their e-government systems to other countries. This not only contributes to their national GDP but also secures their technological dominance and facilitates the development of new products. The spillover effect may also reach Saskatchewan schools and universities, where students will be able to study programs designed to prepare new developers and administrators of e-government systems. Internationally renowned Saskatchewan research facilities could extend their reach to information technologies.

Third, modern electronic public administration can help market Saskatchewan worldwide in broader than economic terms as a progressive and attractive place to work and live. Estonia's success in Europe and worldwide has attracted media attention, giving Estonia positive exposure. This small country that came out of the Soviet Union with no real economic infrastructure has quickly managed to transform its post-communist identity and became known as an economic and technological tiger. Similarly, Saskatchewan's economic success story is reshaping the perceptions about this part of the Prairie region. By embracing modern technologies in government, we can further diversify the new picture that Saskatchewan is projecting.

Saskatchewan's economic success also brings new challenges. As the population continues to grow due to an influx of people from other provinces and abroad, the public sector needs to stretch its capacity to accommodate the increasing demand for services. At the same time, in spite of this growth, Saskatchewan is still among the fastest-aging provinces. Given the government strategy to keep the provincial public sector lean, these trends create pressure on human resources that affects service delivery and administration. Modern e-government is just the solution that could abridge many of these challenges. Many government services can be moved onto the Internet. End-to-end e-services would significantly reduce the need for personal contact, and the existing service delivery staff could be

transferred to service administration. This system would most likely allow public servants to process larger quantities of requests faster and without adding more people to the government payroll.

Another benefit of e-government comes from its ability to provide services to users no matter where they are. Saskatchewan's large territory and dispersed population make traditional service delivery and administration expensive to maintain and expand. E-government, on the other hand, can eliminate the disadvantage of remote areas. Solid Internet coverage throughout the province will enable equal access to government services for all citizens. It may also contribute to the revival of rural communities and small towns by making them independent of larger centres for their government services.

Estonia's achievements



Republic of Estonia

Population: 1,274,709 (July 2011 est.)

GDP per capita: \$20,600 (2011 est.)

Area: 45,228 sq km.

"Estonia is the 132nd smallest country in the world by land mass, yet it produces more [business] start-ups per head of population than any other country in Europe. It has a population the size of Copenhagen but has one of the world's most advanced e-governments."²⁶ This quote from *The Wall Street Journal* only touches upon some of Estonia's many accomplishments since

regaining independence from the Soviet Union in 1991. A country that 21 years ago found itself with limited financial resources and almost no industries to build upon has since been dubbed a "Baltic Tiger" and managed to become a leader in information technologies and innovative public policies. Skype, which is perhaps the best-known Estonian company, is just one of many successful start-ups that originated in Estonia and which gave Estonia its second name, Start-up Nation. World-class e-government, sound economic policies and remarkable innovative potential make Estonia a great source of inspiration.

Like Saskatchewan, Estonia has demonstrated a long-term commitment to balanced budgets. In fact, in the past 10 years, it has produced budget surpluses except during the crisis years of 2008 and 2009. As a result, Estonia has the lowest debt ratio in the European Union (EU) (6 per cent of GDP). During the economic recession, Estonia adopted strict austerity measures to prevent its budget from growing out of control. The result was a temporary but steep decline of GDP and high unemployment. The pre-recession unemployment of 4.0 per cent in July 2008 temporarily shot up to 20.1 per cent in April 2010. Only two years later, the unemployment rate dropped by 8.6 percentage points to 11.5 per cent, and the economy is steaming toward full recovery. With 7.6 per cent GDP increase in 2011 and 3.6 per cent in the third quarter of 2012, Estonia is the fastest-growing EU economy. Construction and information technologies have contributed the most to the growth for the fifth quarter in row.²⁷ Interestingly, while in the EU new business registrations were down, Estonia registered 14,000 new enterprises in 2011, 40 per cent more than in the same period in 2008.²⁸

With only 1.27 million people, Estonia has managed to become a global leader in e-solutions. Successive Estonian governments have had one basic tenet in their ICT policy: creating the enabling conditions for the information society and developing the ICT sector.²⁹ Nowadays, Estonian e-government is praised around the world. The country holds a world record for the fastest establishment of an enterprise via the Internet, using the e-Business Register. As early as 2005, Estonia became the first country in the world to enable its citizens to vote in political elections over the Internet (first in Estonia's municipalities).

Estonia's e-government can easily compare with systems implemented by more-affluent countries. In 2011, Estonia ranked the eighth in the world in the Waseda

e-government ranking, and it is the only Eastern European state among the first 20 countries.

Estonia's unique e-solutions have been in demand around the world, and over 40 countries use e-government technology developed therein. For example, in September 2011, Estonia and Greece signed an agreement to implement Estonia's e-solutions to cut red tape, reduce corruption and improve transparency. In 2007, Estonia made history again when it became the first country to defend itself successfully against a large-scale cyber attack. Subsequently, Tallinn, the capital of Estonia, was chosen in 2008 to become the home of the NATO Cooperative Cyber Defence Centre of Excellence.³⁰ In 2012, Estonia introduced a redesigned one-stop-shop e-government state portal, www.eesti.ee (the first version was launched in 2003), thus continuing improvements to citizen services and maintaining the country's competitive advantage.

Estonia's e-government and e-infrastructure

The grounds for Estonia's success were set much earlier, however. During the 1990s, important steps were taken in building the necessary infrastructure, physical and legislative. A dilapidated telecommunication network was modernized, and data protection and privacy legislation was adopted.³¹ At the same time, the private sector developed a passion for high tech. In particular, the nation's banks developed and introduced online services that were ahead of anything available in the West.³² In 1998, Estonia adopted the country's first information society strategy. The same year, the government launched the first backbone network, EEBone, connecting all branches of government with secure Internet and intranet.³³

As early as 2000, e-Tax Board was made available for taxpayers to file, view and correct their income taxes, file VAT (Value-Added Tax) returns, submit VAT refunds, calculate social tax and view their tax account balances.³⁴ According to Estonia's President, Toomas Hendrik Ilves, the adoption of a flat tax in 1994³⁵ helped build support for e-government. Remarkably, in 2011, 94 per cent of tax declarations were filed online. In his words: "If you combine a flat tax with a computerized system you end up with a system that is easy to computerize because it is flat, and because it is flat and computerized then people can—and indeed do—do their taxes really quickly."³⁶

In 2001, the X-Road system (X-tee in Estonian) was implemented, and it functions as a middle-tier data exchange layer that enables government and private databases to communicate.³⁷ Originally used to query the various databases, it has been developed to write to multiple databases, transmit large data sets and perform searches across multiple databases.³⁸ As a true cornerstone of the Estonian e-government system, it connects Web portals and applications with national databases such as the Population Register, Business Register, Health Insurance Register, National Pension Register, Passport Register, Ship Register, Vehicle Registration and more than 130 other registers.³⁹ X-Road is also connected with

municipal databases and portals, telecommunication companies, national energy and utilities providers as well as Estonia's banks.

The main purpose of X-Road is to take the data collected to accomplish one task, store it and communicate it across the network in order to make future transactions easier. The system does not require users to enter the same data repeatedly. Instead, the data is used again and again, regardless of the e-service that collected the data in the first place. The Estonian system is unique in the way that it connects existing databases created by various public and private entities. It did not require rebuilding the databases to fit the e-government. The e-government was built to fit and communicate with the databases already in place.

Access to X-Road and applications that utilize this information highway is enabled in three parallel ways. Historically, the oldest option is the use of personal certificates from Estonia's banks to access online banking. As mentioned earlier, Estonia developed excellent and secure online banking solutions very early in the 1990s ahead of anyone else. Due to the immaturity of any other solution, bank certificates became the first means of identification when accessing any of the government e-services.⁴⁰

In 2002, Estonia started issuing national ID Cards that became an

Estonia's E-government Milestones

2006

- Estonian students taking national exams can register on the Estonian Citizen's Portal to receive their results by e-mail or on their mobile phones.
- Estonian high school graduates can apply to universities online.

2007

- EEsti.ee (State Portal) merges with the State Information Portal and the Citizen's Portal to create integrated services for citizens, entrepreneurs and state officials.
- New, user-friendly tax and customs Web service is launched.
- Businesses can submit annual accounting reports electronically.
- Launch of Mobile ID service, which enables identification of a person and signature of digital documents by mobile phone.

2008

- People who submitted tax returns electronically can benefit from refunds well before those who completed theirs on paper.
- Residents of Tallinn can renew their parking permits online using their eID Card, Mobile-ID or Internet banking authorization codes.

2009

- To encourage cross-border trade and investment, Finnish ID Cards can be used to establish a business in Estonia. Currently, foreign citizens from the following countries can also log in with their national IDs: Germany, Spain, Iceland, Lithuania, Luxembourg, Portugal, Slovenia, Finland, Sweden and Austria.

Cont'd.

Milestones 2010

- Open-source application is made available to public administrations to organize polls, referenda, petitions, public inquiries and to record electronic votes using electronic identity cards.
- Digital prescription system is launched. As a result, doctors, pharmacies and patients save time.
- The Estonian Unemployment Insurance Fund launches self-service employment portal. Citizens may create resumes, apply for jobs, and view decisions.
- Mobile-ID can be used for electronic voting in elections.

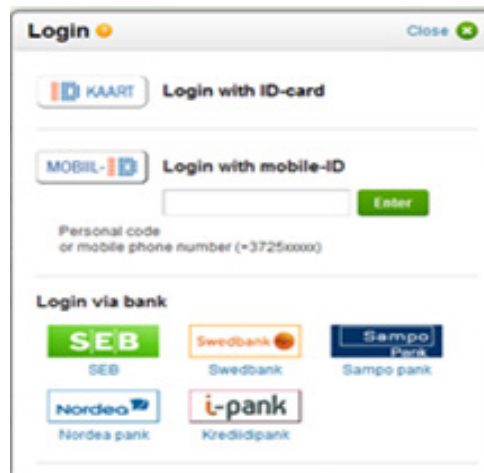
2011

- The Rural Municipality Portal launched, enabling local governments to customize it to their preferences and to provide their own e-services.
- Estonia’s e-Annual reporting application for businesses is voted a winner at a global e-Contest and it receives the World Summit Award.
- Tallinn is awarded with the European Public Sector Award 2011 for citizen e-services.

2012

- The redesigned www.eesti.ee is made available to further improve users’ experience with this one-stop-shop e-government portal.

Source: <http://www.epractice.eu>



Quick Stats for Estonia’s ID Cards

On July 19, 2012:

- Active cards: **1,185,547**
- Digital signatures: **87,800,550**
- Electronic authentications: **145,411,157**

Source: <http://www.id.ee/?lang=en>

alternative to bank certificates. These ID Cards became mandatory for all citizens and permanent residents over 15 years of age. The cards also function as a digital signature for citizens. As such, they are legally binding.⁴¹ In July 2012, almost 1.2 million ID Cards were active, which is almost all of Estonia’s population over the age of 15.

The most recently added means of accessing e-government is Mobile ID. An Estonian mobile phone operator in co-operation with several banks and the government’s Certification Centre launched this solution in 2007. Like ID Cards, Mobile IDs can be used to access e-services and sign digital documents. The ID is integrated in a special SIM card and can be obtained from a mobile phone provider. When accessing an e-service, the user enters a pin code into the phone. The logged in screen appears, and the client can start using the e-service. The main advantage of this option is that there is no need for a card reader. Finally, all three options can be used as an alternative to one another as shown in the snapshot from the State Portal.

One-Stop-Shop Portal

In 2003, the State Portal (www.eesti.ee) was launched. This cornerstone of Estonia's e-government was designed to provide a one-stop-shop experience, serving citizens, entrepreneurs and state officials. It features an Internet space for communication with the government and offers reliable information and e-solutions for the three groups of e-government clients.⁴² Currently, www.eesti.ee hosts hundreds of e-services offered by various Estonian institutions.⁴³

Navigation through the e-services on the State Portal is possible in a number of ways. Users can choose from three main categories: citizen, entrepreneur or official. These main sections are further divided into subcategories (see table below). Users can also perform an alphabetical or full text search. They can narrow the search based on the client's existing profile, whether the services are for a child, a handicapped person, a pensioner, teenager or worker. Apart from e-services, the State Portal also offers a Topics section, which is subdivided to provide information for citizens and entrepreneurs. Individual topics provide detailed information about government services. In some cases, they also provide direct links to e-services hosted by other portals. The State Portal enables users to access their personal data and make updates to their My Data section.

For a Citizen

- Housing
- Education and Science
- Environment
- Culture and Leisure Time
- Traffic
- Family
- Money and Ownership
- Travel
- State and the Citizen
- National Defence
- Health Care and Protection
- Consumer Protection
- Work and Employment Relations
- Benefits and Social Insurance
- Legal Aid
- Foreigners in Estonia and Estonians Abroad
- Official Forms
- Elector's E-card
- Police E-services
- Population Register

For an Entrepreneur

- Official Forms
- X-Road
- Authorization
- Establishing a Company
- Environment
- Local Authorities
- Culture and Leisure Time
- Licences and Registration
- Taxes and Customs
- M-teenused
- Police E-services
- National Defence
- Structural Assistance Information System
- Transport
- Labour Environment
- Legal Aid
- X-tee Entrepreneur Portal

For an Official

- Official Forms
 - X-Road
 - Authorization
 - Document Exchange Centre
 - Housing
 - M-teenused
 - Education and Science
 - Environment
 - Local Authorities
 - Culture and Leisure Time
 - Licences and Registration
 - Population Register
 - National Defence
 - The State and the Citizen
 - Structural Assistance Information System
 - Health Care and Protection
 - Benefits and Social Assistance
 - Transport
 - Work and Employment Relations
 - Work Plan Service
 - Legal Aid
-

FOR A CITIZEN – E-services for citizens contain a broad spectrum of tasks that may be necessary in different life situations. The e-services include online applications for various construction permits, reports to the real estate register,

cancelling organized waste collection and applying for land-tax exemptions in the housing subsection. Students can enroll online in various schools, view state exam results and manage professional certificates. The portal also allows a student to request state exam results by text message. Users can apply for public event permits and sports benefits for children, query a driver's licence record or a car registration and look at car insurance history. The portal contains applications for a variety of social benefits, pension, childbirth registration, pet registration, placement in a retirement home, babysitting service and many others.

In the Money and Ownership subsections, users can view account balances from the Estonian Tax and Customs Board, access information about income tax, pension payments, and social tax deducted from salaries. Under the Legal Aid subcategory, citizens can find the e-Notary service. E-Notary is a secure and efficient feature that is used to complete the tasks required of a notary. Clients can electronically obtain a legally valid copy of a contract from the government portal at no cost. In other subsections, the client can find applications for service in the defence forces, citizenship exams, elector's e-card, police e-services, obtain a weapons permit, conduct a company search, view and use e-prescriptions or make updates to the Population Registry. Estonia's major municipalities also provide some e-services for citizens.

FOR AN ENTREPRENEUR – E-services for entrepreneurs allow business owners to conduct their interactions with the government online. Some of the e-services include applications for and queries about activity licences, company searches, project applications, advertisement tax declarations, advertisement permits, truck traffic permits, allowance applications for non-profit organizations and company tax and customs account balances. The Structural Assistance subsection offers online applications for European Union structural funds. M-teenused (m-services in English) enables entrepreneurs to use mobile e-government services. In the Labour Environment subsection, businesses can submit insurance data to the Estonian Health Insurance Fund or apply to join the Document Exchange Centre to be able to benefit from the centralized document exchange. In many instances, e-services for citizens are also available to entrepreneurs, such as numerous permit applications or e-Notary services.

FOR AN OFFICIAL – Government officials access the administration of e-services through their own section on the State Portal. Interestingly, they use the same identification to access the system (bank certificates, ID Card or Mobile ID) as citizens or entrepreneurs. Their activities are monitored and registered so that citizens and entrepreneurs can view who has accessed their information. This is one of the safety features that prevents information leaks. Users may submit a request for an explanation if an official accessed their data without a reason. Unwarranted access has disciplinary consequences for the officer responsible.⁴⁴

E-tax and other business e-services

The State Portal is the dominant but not sole platform that provides e-services in Estonia. Different portals host several e-services. Among such services are business registrations and submission of taxes. Although these e-services are on other portals, users can still seamlessly access them directly from the State Portal. In practice, citizens or entrepreneurs are sent to the appropriate site by selecting the applicable subject area from the list of Topics on the State Portal. For example, if an entrepreneur needs to file taxes, he or she chooses Taxes and Customs and then selects the type of tax required (see box at right) and a page with clear and relevant information as well as a link to the appropriate portal opens. Access is through bank certificates, ID Card or Mobile ID.

E-TAX, known as e-Tax Board, was one of the first e-services available in Estonia (launched in 2000). As discussed earlier, it quickly became a popular utility with over 94 per cent of people filing their taxes online. The Estonian Tax and Customs Board Web site (www.emta.ee) hosts e-Tax. An annual e-Tax declaration can be completed online in 10 minutes.⁴⁵ Online tax filing and additional e-services such as declarations and notice submissions make it significantly easier for entrepreneurs to conduct monthly reporting on income tax, social tax, unemployment insurance premiums and funded pension payments.

E-BUSINESS REGISTER is hosted by the Centre of Registries and Information Systems website (www.rik.ee), which is also known as e-RIK. E-Business Register was launched in 2007, and at present, 40 per cent of private limited companies are registered online. Registering a private limited company through the portal means there is no longer the need to visit a notary. An electronic signature and e-Notary ensure legal certainty. A process that used to take five days can be completed in two hours. The record time for the registration of a new legal entity is nine minutes.⁴⁶

Apart from the e-Business Register, e-RIK also offers e-Land register, e-File, e-Annual Report and e-Notary. E-File is a central information system that provides an overview of the different phases of the criminal, civil, administrative, and misdemeanor procedures, procedural acts and court adjudications.⁴⁷

E-Tax Options

- Value-added tax
- Income tax
- Social tax
- Unemployment insurance premium
- Fringe benefit tax
- Environmental charges
- Taxes payable in the case of cross-border operations
- Other taxes

Establishing a Company

- Selection and verification of the business name
- Selection and verification of a trademark
- Legal protection for trademarks
- Selecting a primary area of activity
- Registering a company
- Registration with the Tax and Customs Board
- Registering employees with the Health Insurance Fund
- Registering an Internet domain name

Source: <https://www.eesti.ee>

I-voting

Voting over the Internet enables voters to cast their ballots from any Internet-connected computer, anywhere in the world. In Estonia, I-voting complements voting at polling stations on election day, by mail from abroad, in person at Estonia’s foreign missions and on board Estonia’s ships. To participate in I-voting, Estonians need to enter the system with their ID Card, Mobile ID, or digi ID, which is a document similar to the ID Card but without a user’s photo. Internet voting takes place for seven days, starting ten days prior to election day. A voter has the opportunity during the I-voting period to recast his or her vote, with the last vote cast being the one that counts. An Internet vote can be cancelled if the voter casts a new

Estonia’s I-Voting – Lessons Learned

- Internet voting attracts people to other electronic public services. In 2005, 61%; in 2007, 39%; and in 2009, 19%; and once more, 19% of I-voters gave their first digital signature at I-voting.
- Long-term planning on the national level to introduce widespread means for electronic authentication creates a basis for further development.
- The existence of a countrywide electronic authentication system is vital. It significantly reduces electoral costs and raises public trust.
- Internet voting is part of the concept of e-government. It widens accessibility and encourages participation. However, a change of attitude takes time, sometimes even years or decades.

Source: Estonian National Electoral Committee

Statistical data on I-voting in Estonia

	Local elections 2005	Parliamentary elections 2007	European Parliamentary elections 2009	Local elections 2009	Parliamentary elections 2011
Eligible voters	1,059,292	897,243	909,628	1,094,317	913,346
Participating voters (voters turned out)	502,504	555,463	399,181	662,813	580,264
Voter turnout	47.4%	61.9%	43.9%	60.6%	63.5%
I-voters	9,317	30,275	58,669	104,413	140,846
I-voters among participating voters	1.9%	5.5%	14.7%	15.8%	24.3%
I-votes among advance votes	7.2%	17.6%	45.4%	44%	56.4%
I-votes cast abroad among I-voters	not available	2% 51 states	3% 66 states	2.8% 82 states	3.9% 105 states
I-voters using Mobile ID	not available	not available	not available	not available	2,690
I-voters using Mobile ID among I-voters					1.9%

Source: <http://www.vvk.ee/voting-methods-in-estonia/engindex/statistics>

vote in person during advance polls or regular polls on election day.

In 2005, Estonia was the first country in the world to use I-voting for political elections in municipalities. In 2007, it was first to allow I-votes to be cast for parliamentary elections. Since then, Estonians could vote online at three additional elections. The statistics collected during these elections show the growing popularity of I-voting.

When I-voting was introduced for local elections in 2005, I-voters represented 1.9 per cent of participating voters. Six years later, during the last parliamentary elections in 2011, the proportion of I-voters constituted 24.3 per cent. In total numbers, the participation of I-voters tripled by the 2007 parliamentary elections and almost doubled during each following election. It will be interesting to observe how overall participation evolves. The increase in participation for local elections from 47.4 per cent in 2005 to 60.6 per cent in 2009 as well as a moderate increase in parliamentary elections in 2007 and 2011 may indicate that I-voting has had a positive effect on citizens' political engagement. However, more data is needed, as the differences may well be a result of other political factors. Elections results showed that I-voting is not only for young people. During the 2011 parliamentary elections, 21 per cent of people over 55 and 19 per cent of those between 45 and 54 years of age voted online.⁴⁸

E-health

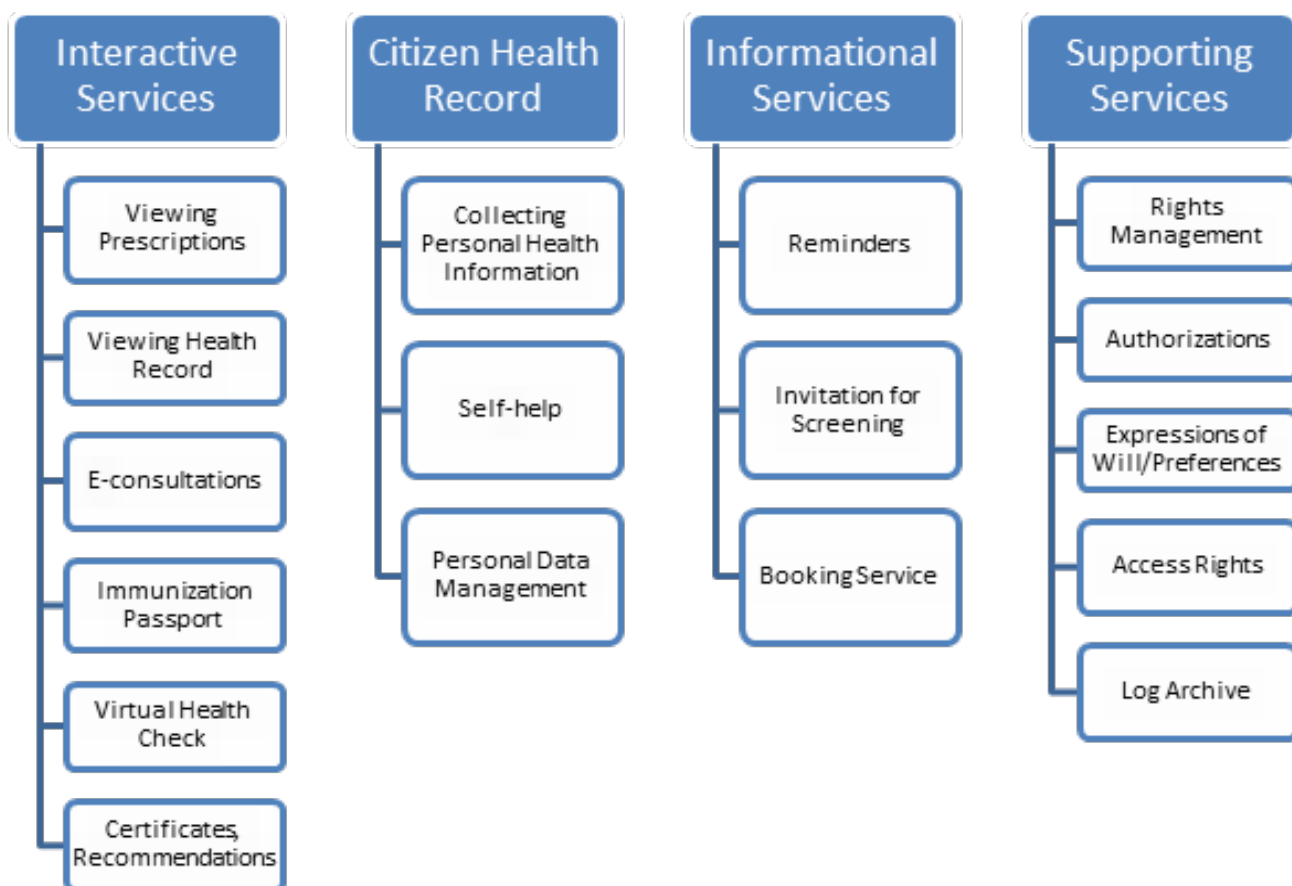
The main feature of Estonia's health e-services is the Electronic Health Record, first introduced in 2008. It integrates data from Estonia's health care providers to form an inclusive record for each patient. Patients can access their data and many complementary health e-services on the Patient Portal (www.digilugu.ee). Users can also navigate to the Patient Portal from the State Portal and use their ID Card to access their or their children's information.

The system provides a convenient tool for doctors, as they see patient records in a single electronic file. Records also contain image files such as X-rays. Importantly, in an emergency, a doctor can use a patient's ID Card to read time-critical information such as blood group, allergies, recent treatments, ongoing medication, or pregnancy. In addition, the system collects statistical data that allows the health ministry to follow trends, identify and respond to epidemics and make adjustments to improve the effectiveness of health care. Users can review their prescriptions and previous doctor visits, schedule new ones and even receive health advice (see chart pg. 30).⁴⁹

In 2010, the e-Prescription utility was implemented, and it has helped significantly in reducing paperwork and doctor visits. Doctors can prescribe medication refills for patients online without having to meet with them. Patients simply present their ID Card at a pharmacy and pick up their medication. Importantly, e-prescriptions lower the chance of errors, as both doctors and pharmacists can see a patient's allergies and other health conditions that can make some medication not suitable

for a particular person.

Estonia accomplished the e-Health project with a small budget of €2.24-million (\$1.81-million CAD in 2005).⁵⁰ With a limited budget, the e-health initiative turned to the existing infrastructure such as X-Road and the ID Card. The system was also set up to require minimal changes on the health care side.⁵¹



Source: http://www.pro-ehealth.eu/casestudies/ProeHealth_Case_Report_Estonia_EHR.pdf

E-school

E-School (eKool in Estonian) is one of the most widely used Internet applications in Estonia. It was made available in 2002. E-School (www.ekool.ee) is located on a separate Web site, but it is connected to X-Road and may also be accessed from the State Portal. Users can enter the system with a login and password, a bank certificate, an ID Card or a Mobile ID.

The system is designed to serve a number of users. Teachers enter grades and attendance, post homework assignments and evaluate students' behavior. They can also send messages to parents, students or an entire class. Both parents and students can read grades and keep track of homework assignments.

The system allows parents to stay closely involved in their children's education. They can read teachers' notes and communicate directly with them. Students also have the option to save and post their best work in personal e-portfolios. The benefit for school management is that it can follow teachers' work, students' progress and check attendance. District administrators benefit from having the latest statistical reports on demand.⁵²

Among other popular features of e-School is the electronic material available for different courses. Students and parents can look up lesson descriptions or see a test planner with a calendar of all upcoming exams. The most significant benefit of the system is that children and parents can stay on top of preparations and homework.⁵³ In particular, parents can become much more involved in helping their children improve in areas where they are falling behind. Lost notes from teachers are a thing of the past.⁵⁴ Parents do not have to rely on their children's interpretation of the problems they face in school. Teachers can send a text message to parents when their children do not attend class.

E-cabinet, e-law and others

E-Cabinet is another electronic feature that is profoundly changing how government affairs are run in Estonia. Aivar Rahno, the Head of the Department of Cabinet Meetings, explains that this "simple" Web solution was motivated by the goal of paperless government. Introduced in 2000, it took only three months to develop and make operational. Unlike the e-services presented previously, e-Cabinet is not an open system. It has approximately 500 users consisting of ministers, their support staff and other government officers involved in the preparation of documents for Cabinet meetings. Access is again by ID Card or Mobile ID from anywhere in the world.

Among the main benefits are faster movement of information among all involved parties, documents do not become disorganized, users can mark opinions, make comments and engage in pre-voting.

The audio-visual feature of the e-Cabinet system allows for remote participation by the ministers, something which is often utilized. One of the most obvious effects is a reduction of the length of Cabinet meetings. The average length of the weekly Cabinet meetings was cut from four to five hours to just 30 to 90 minutes,⁵⁵ mainly because most of the work is prepared ahead of time. Finally, users also have access to the large archive of government documents. At the end of each Cabinet meeting, the prime minister or the Cabinet secretary electronically signs the required documents, which are sent to the next stage of the legislative process.⁵⁶

While e-Cabinet improves the efficiency of the executive process from within, e-Law is Estonia's powerful tool to engage the population and facilitate transparency. Launched in 2003, it is accessible on the Estonian State Gazette website (www.riigiteataja.ee). Visitors to the website can see every single draft law, follow its

progress through the parliamentary process, see the changes made to it and search the drafts that became laws. A similar utility is also available for Tallinn.⁵⁷ The Estonian government also encourages citizens to submit their ideas and suggestions through the Participation website (www.osale.ee). Users can take advantage of a utility that allows the collection of votes or support for particular ideas or suggestions or they can comment on various government drafts.

Another item in Estonia's e-tool box is DigiDoc. It enables anyone who signs in with an ID Card or Mobile ID to upload any document, digitally sign it and forward it to any other party for signatures. Users can sign text documents, photographs, instant messaging conversations or voice recordings. Individuals can also store their files in a unique folder and see any file they have signed previously. The system is heavily used by Estonia's public sector for court documents and municipal contracts. The banking industry also utilizes the system on a regular basis.

This presentation of Estonia's e-services concludes with a table of links to some other interesting electronic services that constitute the country's e-government.

Portal	Link	Description
Ametlikud teadaanded	http://www.ametlikudteadaanded.ee	Official reports
e-Land Register	https://kinnistusraamat.rik.ee	Register of immovables
EAS e-services	https://aken.eas.ee	Enterprise e-services
e-Procurement	https://riigihanked.riik.ee	Public contract portal
e-Register	https://www.e-register.ee	Register of securities
Estonian Land Board Geoportal	http://geoportaal.maaamet.ee	Geological and geographical e-services
Estonian Research Information System	https://www.etis.ee	Research projects information
e-Stat	https://estat.stat.ee	Submission of statistical data
e-Töötukassa	http://et.tootukassa.ee	Unemployment services

Legal framework and potential challenges

A discussion of the e-government legal framework would likely fill a number of pages; therefore, we will only sketch its main contours. Reading about the various e-solutions Estonia has developed, one must ask questions about privacy. Estonia does not take this matter lightly. A number of legislative acts regulate the handling of data, information and electronic identification.

As early as 1996, Estonia adopted the *Personal Data Protection Act*. The Act was later

amended (2003, 2008) to be fully compliant with the EU Data Protection Directive 95/46/EC and to reflect new requirements for data protection. The *Act* protects the fundamental rights and freedoms of persons with respect to the processing of their personal data.

The *Act* distinguishes between “personal data” and “sensitive personal data.” It also establishes that all processed personal data are protected and registered by chief processors (i.e., controllers) with the Data Protection Inspectorate, the data protection authority.⁵⁸

In 1998, the *Archives Act* entered into force. It set principles for collecting, evaluating, archiving, preserving and accessing archival documents. The rules for digital signatures were set in the *Digital Signature Act* in 2000. In 2001, the *Public Information Act* took effect and established rules for the dissemination of public information by state and local agencies, legal entities, and private entities that conduct public duties including education, health care, social and other public services.⁵⁹

The 2004 *Information Society Services Act* established the requirements pertaining to electronic commerce providers as well as the organizations of supervision and liability in the case of a violation of these requirements. In 2008, the *System of Security Measures for Information Systems Act* was adopted. It introduced a system of security measures for information systems that are used for processing data that is contained in state and local government databases.⁶⁰

It is necessary to say that e-government legislation is not static and has been evolving and becoming more sophisticated as the e-government solutions have become more and more complex. To some, e-solutions that integrate databases across departments constitute a particular problem concerning personal privacy. The idea that the government collects and knows everything about a person may seem dangerous. Yet, this is not quite the case. First, integrated e-services do not collect more information; they only attempt to make better use of the information that government departments have been collecting so far.

Second, the unique e-government solutions developed by Estonia demonstrate that e-government does not have to lead to a Leviathan or Big Brother state. The Estonian network of databases works by utilizing data sets. Each e-service is associated with a specific data set that tells the main server where to find only the information that is needed. In practice, it means that the main server sends a request to multiple databases to pool together the information necessary for that one task. If new information is needed, it is stored in the database in which it belongs. The system does not create one massive database.

Ultimately, no system that handles private information is absolutely secure, including traditional paper databases. Any new system needs to create an environment of public confidence. Confidence in any system can only be achieved by a combination of quality technological solutions, clear procedural and legislative rules, effective enforcement, and punishment of violations. Governments can also engage in creating public awareness about the measures taken to secure their citizens’ private data.

Arrangements to take care of privacy issues are not the sole challenge that may be faced when taking Saskatchewan’s e-government to the next level. Finding the right technical solution, co-ordinating among departments and wider consensus among decision-makers may be some of the others. Success will require political leadership that is fully committed to a goal that is supported by the public as well as by public officers.

Opportunities for e-government in Saskatchewan

The Estonian system of e-government utilizes solutions that can also suit Saskatchewan very well. One of the main features of the Estonian system is that it integrates existing databases to allow seamless sharing of data via X-Road. Applications that are built on top of this information highway benefit from access to all of the connected databases and thus limit the information that is required from users when completing a transaction. In practice, when a user inputs a piece of information into the system, he or she will not need to provide it again. Since substantial e-government infrastructure already exists in Saskatchewan, the implementation of a new system that enables developers to include these parts and create a more-integrated experience for users has a significant advantage over other solutions.

Another essential part of the Estonian e-government is the electronic identification (bank certificates, ID Card, and Mobile ID) that is the same no matter what e-service is being accessed. In addition to the lack of data sharing, the need to use a different login and password each time a user wants to perform a concrete task is a factor that may discourage many from choosing Saskatchewan e-services. Introducing some kind of province-wide electronic identification would certainly make a great difference in the popularity of e-services. It would also open doors to the implementation of e-services such as Internet voting or electronic signatures. This Saskee (meaning Saskatchewan Key) could be integrated as a chip in driver's licences, bank cards and certainly in mobile phones. This electronic identification could also be used to pay for public transit, parking and perhaps even for services provided by private entities.

Another building block in Saskatchewan e-government should be a one-stop-shop portal. Currently, users of government services receive initial guidance and navigation to the appropriate sites at the main government site, www.gov.sk.ca. Available e-services are provided by an array of government Web sites. Perhaps the highest concentration of services and e-services are found on the Information Services Corporation (ISC) Web site. Apart from online business registration, the ISC Web site provides information and guidance for a large number of other services (e.g., vital records, land titles, personal property, survey plans, etc.) that are not available as end-to-end online services. The ISC Web site would become a true one-stop-shop portal if more services were made available online. The system would need to enable access and connect multiple government databases, and personal identification would need to be secured by a province-wide electronic ID.

The Estonian example has many unique e-solutions, such e-School, e-Health and e-Cabinet, some of which did not require extensive financial resources or long gestation periods. When developing a new application and/or e-service, it is important that it reflects the needs that are specific to Saskatchewan. For example, introducing I-voting for provincial and municipal governments would most certainly result in an unprecedented improvement to citizen services. Nevertheless, I-voting could go even further and enable numerous Saskatchewan lake and cabin communities to run binding elections for their councils online. The provincial parks campground reservation site could post live updates of the number of camping spots available. In the future, a one-stop-shop portal could provide a live feed of the latest news related to government services that could be tailored to a user based on the user's profile. Information from the portal could also be forwarded to the user's e-mail or social network

account. The success of an integrated one-stop-shop solution rests in providing more than just a place to execute requests for services. Progressive portals will create an environment that will engage citizens. The opportunities are unlimited.

Lessons learned from the Estonian case suggest that governments can break new ground by establishing the blocks that support the development of an information society. Easy access is the key. If people and companies have the skills and means to use ICT and get online, content and services will follow. Estonia's example also suggests that a focus on services leads to the most useful high-impact development of e-government. To be successful, well-designed pilot projects are crucial. Finally, decentralized databases coupled with a focus on already working systems can bring greater results than can a unified newly developed solution.⁶¹

E-government is a trend that is already transforming government operations in most developed countries. It is essential that Saskatchewan does not fall behind in this regard but rather positions itself among the leaders. Efficient and user-friendly e-government with integrated e-services can have a positive impact in many areas. Saskatchewan can strengthen its competitive advantage, contain or reduce government costs, create new industries, bring government services to even the most remote areas, empower citizens and market Saskatchewan worldwide.

Endnotes

1. Alberta has 4.1 per cent assets to GDP.
2. Lenihan, D.G. (2002). *Realigning Governance: From E-Government to E-Democracy*. Centre for Collaborative Government.
3. Alhomod, S.M.& Shafi, M.M. (2012). "Best Practices in E government: A Review of Some Innovative Models Proposed in Different Countries." *International Journal of Electronic & Computer Science*.
4. Galindo, Fernando, Francisco Javier García Marco and Pilar Lasala Calleja. *Electronic Government*. Zaragoza: Prensas Universitarias de Zaragoza, 2009. <http://zaguan.unizar.es/record/4495/files/BOOK--2010-002.pdf>. Accessed July 7, 2012.
5. Alhomod, S.M. & Shafi, M.M. (2012). "Best Practices in E government: A Review of Some Innovative Models Proposed in Different Countries." *International Journal of Electronic & Computer Science*.
6. Kitsing, Meelis. National Center for Digital Government. An Evaluation of E-Government in Estonia. Last modified September 16-17, 2010. http://microsites.oii.ox.ac.uk/ipp2010/system/files/IPP2010_Kitsing_1_Paper_0.pdf. Accessed August 1, 2012.
7. Dawes, Sharon S. "The Future of E-Government." New Your Council Select Committee on Information Technology in Government's Hearing. Center for Technology in Government, University at Albany, 2002.
8. Garson, G. David. *Public Information Technology and E-Governance: Managing the Virtual State*, (Mississauga: Jones & Bartlett Learning, 2006), 31.
9. Fenwick, William, Erin John and Jason Stimac. Santa Clara University School of Law. "The Necessity of eGovernment." *Santa Clara Computer and High Technology Law Journal*. <http://digitalcommons.law.scu.edu/chtlj/vol25/iss3/1/>. Accessed June 14, 2012.
10. Ibid.
11. Garson, G. David. *Public Information Technology and E-Governance: Managing the Virtual State*, (Mississauga: Jones & Bartlett Learning, 2006), 261; James S.L. Yong. *E-Government in Asia: Enabling Public Service Innovation in the 21st Century*, Chap. 1. (Singapore: Times Edition-Marshall Cavendish, 2005) http://www.egov-in-asia.com/egov-2/cms_data/chapter1.pdf. Accessed June 21, 2012.
12. Lenihan, Donald G. Centre for Collaborative Government. "Realigning Governance: From E-Government to E-Democracy." <http://kta.on.ca/pdf/cg6.pdf>. Accessed June 17, 2012.
13. Garson, G. David. *Public Information Technology and E-Governance: Managing the Virtual State*, (Mississauga: Jones & Bartlett Learning, 2006), 261.
14. Seifert, Jeffrey W. Congressional Research Service, the Library of Congress. "A Primer on E-Government: Sectors, Stages, Opportunities, and Challenges of Online Governance." Last modified January 28, 2003. <http://www.fas.org/sgp/crs/RL31057.pdf>. Accessed June 23, 2012.
15. Coursey, David and Donald F. Norris. "Models of E-Government: Are They Correct? An Empirical Assessment." *Public Administration Review*. <http://wiki.dbast.com>. Accessed June 23, 2012.
16. Seifert, Jeffrey W. Congressional Research Service, the Library of Congress. "A Primer on E-Government: Sectors, Stages, Opportunities, and Challenges of Online Governance." Last modified January 28, 2003. <http://www.fas.org/sgp/crs/RL31057.pdf>. Accessed June 23, 2012.
17. Information Services Corporation. "Business Registration." <https://business.isc.ca/Pages/default.aspx>. Accessed June 24, 2012.
18. Wilson, Ian E. The Stratford Institute for Digital Media. *Becoming a Digital Nation: An Evaluation of Provincial and Territorial eGovernment Initiatives*. Last modified April 2012. http://stratfordinstitute.ca/wp-content/uploads/2012/04/eGovernment_final_web.pdf. Accessed July 2, 2012.
19. Ibid.
20. United Nations. "E-Government Survey 2012: E-Government for the People." <http://unpan1.un.org/intradoc/groups/public/documents/un/unpan048065.pdf>. Accessed August 1, 2012.
21. Institute of e-Government, Waseda University. "The 2012 Waseda University International e-Government Ranking." http://www.e-gov.waseda.ac.jp/images/Press_Released_on_e-Gov_ranking_2012.pdf. Accessed July 10, 2012.
22. Kitsing, Meelis. National Center for Digital Government. "An Evaluation of E-Government in Estonia." Last modified September 16-17, 2010. http://microsites.oii.ox.ac.uk/ipp2010/system/files/IPP2010_Kitsing_1_Paper_0.pdf. Accessed August 1, 2012.
23. United Nations. United Nations Conference on Trade and Development. Trade and Development Board Commission on Investment, Technology and Related Financial Issues, Expert Meeting on Good Governance in Investment Promotion. http://unctad.org/en/docs/c2em15d2_en.pdf. Accessed July 2, 2012.
24. Reigas, Annel. "Estonia Exports E-government Worldwide." *Inquirer Net*. July 5, 2010. <http://newsinfo.inquirer.net/breakingnews/infotech/view/20100705-279253/Estonia-exports-e-government-worldwide>. Accessed July 11, 2012.

25. Hicks, Robin. "Korea Exports E-government Model to Japan." *Asia Pacific futuregov*. <http://www.futuregov.asia/articles/2010/apr/09/korea-exports-e-government-model-japan/>. Accessed July 11, 2012.
26. Rooney, Ben. "The Many Reasons Estonia Is a Tech Start-up Nation." *The Wall Street Journal*. June 14, 2012. <http://online.wsj.com/article/SB10001424052702303734204577464343888754210.html>. Accessed August 1, 2012.
27. Statistics Estonia. "Economic growth accelerated in the 3rd quarter" <http://www.stat.ee/57468>. Accessed November 13, 2012.
28. D., V. "Baltic Green Shoots: Start-ups in Estonia." *The Economist*, January 6, 2012. <http://www.economist.com/blogs/schumpeter/2012/01/start-ups-estonia>. Accessed July 12, 2012.
29. Petersoo, Indrek. Ericsson Estonia. "Life in E-stonia: How a Small Nation Became an ICT Powerhouse." http://www.ericsson.com/res/thecompany/docs/publications/business-review/2012/issue2/life_in_e-stonia.pdf. Accessed July 13, 2012.
30. Ibid.
31. European Commission. "eGovernment in Estonia." <http://www.epractice.eu/files/eGovernmentEstonia.pdf>. Accessed July 13, 2012.
32. Petersoo, Indrek. Ericsson Estonia. "Life in E-stonia: How a Small Nation Became an ICT Powerhouse." http://www.ericsson.com/res/thecompany/docs/publications/business-review/2012/issue2/life_in_e-stonia.pdf. Accessed July 13, 2012.
33. Kitsing, Meelis. "Success without Strategy: E-Government Development in Estonia." *Policy & Internet*. 3. no. 1 (2011): 1-21. http://observgo.quebec.ca/observgo/fichiers/19497_Success%20Without%20Strategy_%20E-Government%20Development%20in%20Estonia-1.pdf. Accessed July 16, 2012.
34. Petersoo, Indrek. Ericsson Estonia. "Life in E-stonia: How a Small Nation Became an ICT Powerhouse." http://www.ericsson.com/res/thecompany/docs/publications/business-review/2012/issue2/life_in_e-stonia.pdf. Accessed July 13, 2012.
35. Greenberg, Deena. University of Pennsylvania. *College Undergraduate Research Electronic Journal*. "The Flat Tax: An Examination of the Baltic States." <http://repository.upenn.edu/cgi/viewcontent.cgi?article=1158&context=curej>. Accessed July 13, 2012.
36. Rooney, Ben. "The Many Reasons Estonia Is a Tech Start-up Nation." *The Wall Street Journal*, June 14, 2012. <http://online.wsj.com/article/SB10001424052702303734204577464343888754210.html>. Accessed August 1, 2012.
37. European Commission. "eGovernment in Estonia." <http://www.epractice.eu/files/eGovernmentEstonia.pdf>. Accessed July 13, 2012.
38. Petersoo, Indrek. Ericsson Estonia. "Life in E-stonia: How a Small Nation Became an ICT Powerhouse." http://www.ericsson.com/res/thecompany/docs/publications/business-review/2012/issue2/life_in_e-stonia.pdf. Accessed July 13, 2012.
39. Järv, Ain. Sertifitseerimiskeskus. "e-Economy and e-Government in Estonia." Last modified 05.01 (January).2006. http://www.nbp.pl/aktualnosci/wiadomosci_2006/e-estonia.pdf. Accessed July 14, 2012.
40. Rahno, Aivar, Püüa, Margus, Tikk, Mihkel, Sepp, Toomas & Priisalu, Jaan. "Estonian E-government: E-Cabinet, X-Road, Gov. Portal, Tallinn Story." eRiigiAkadeemia. <http://www.youtube.com/watch?v=NNpndQZZ0y0>. October 2, 2011.
41. European Commission. "eGovernment in Estonia." <http://www.epractice.eu/files/eGovernmentEstonia.pdf>. Accessed July 13, 2012.
42. Ibid.
43. Petersoo, Indrek. Ericsson Estonia. "Life in E-stonia: How a Small Nation Became an ICT Powerhouse." http://www.ericsson.com/res/thecompany/docs/publications/business-review/2012/issue2/life_in_e-stonia.pdf. Accessed July 13, 2012.
44. Rahno, Aivar, Püüa, Margus, Tikk, Mihkel, Sepp, Toomas & Priisalu, Jaan. "Estonian e-government: e-Cabinet, x-Road, Gov. Portal, Tallinn story." eRiigiAkadeemia. October 2, 2011. <http://www.youtube.com/watch?v=NNpndQZZ0y0>.
45. e-Governance Academy. "e-Estonia: e-Services for Citizens." https://www.ria.ee/public/publikatsioonid/e-Services_for_Citizens_demo.pdf. Accessed July 15, 2012.
46. Company Registration Portal. "What is the Company Registration Portal?" http://www.egov-estonia.eu/wp-content/themes/atriumax/files/RIK_company_registration_portal.pdf. Accessed July 15, 2012.
47. e-RIK - Centre of Registries and Information Systems. "e-File." <http://www.egov-estonia.eu/e-file>. Accessed July 16, 2012.
48. Vabariigi Valimiskomisjon. "Statistics about Internet Voting in Estonia." <http://www.vvk.ee/voting-methods-in-estonia/engindex/statistics/>. Accessed July 16, 2012.
49. e-Estonia. "Electronic Health Record." <http://e-estonia.com/components/electronic-health-record>. Accessed July 16, 2012.
50. Western Union® Online FX. <http://fxtop.com/en/historates.php?A=2.24&C1=CAD&C2=EUR&YA=1&DD1=01&MM1=01&YYYY1=2005&B=1&P=&I=1&DD2=31&MM2=12&YYYY2=2005&btnOK=Go!> Accessed July 17, 2012.

51. Astok, Hannes. E-Health Foundation. "Estonian E-health Solutions." <http://www.coe.int/t/dg3/sscssr/Source/07%20extra-curricular%20-%20e-health.pdf>. Accessed July 20, 2012.
52. e-Governance Academy. "e-Estonia: e-Services for Citizens." https://www.ria.ee/public/publikatsioonid/e-Services_for_Citizens_demo.pdf. Accessed July 15, 2012. e-Estonia. "e-School." <http://e-estonia.com/components/e-school>. Accessed July 22, 2012.
53. e-Governance Academy. "e-Estonia: e-Services for Citizens." https://www.ria.ee/public/publikatsioonid/e-Services_for_Citizens_demo.pdf. Accessed July 15, 2012.
54. e-Estonia. "Raising the e-Generation." <http://e-estonia.com/case-studies/raising-e-generation>. Accessed July 22, 2012.
55. e-Estonia. "e-Cabinet." <http://e-estonia.com/components/e-cabinet>.
56. Rahno, Aivar, Püüa, Margus, Tikk, Mihkel, Sepp, Toomas & Priisalu, Jaan. "Estonian e-government: e-Cabinet, x-Road, Gov. Portal, Tallinn story." eRiigiAkadeemia. <http://www.youtube.com/watch?v=NNpndQZZ0y0>. Accessed October 2, 2011.
57. e-Estonia. "e-Cabinet." <http://e-estonia.com/components/e-cabinet>. Accessed July 23, 2012.
58. European Commission. "eGovernment in Estonia." <http://www.epractice.eu/files/eGovernmentEstonia.pdf>. Accessed July 13, 2012.
59. Ibid.
60. Ibid.
61. Petersoo, Indrek. Ericsson Estonia. "Life in E-stonia: How a Small Nation Became an ICT Powerhouse." http://www.ericsson.com/res/thecompany/docs/publications/business-review/2012/issue2/life_in_e-stonia.pdf. Accessed July 13, 2012.

Further Reading

June 2011

**Telecommuting and Working at Home in
the Emerging Work Environment**

By Wendell Cox

<http://www.fcpp.org/publication.php/3812>

June 2012

**Usage Based Billing for Internet and
the Future of the Internet**

By Roland Renner

<http://www.fcpp.org/publication.php/3831>

For more see

www.fcpp.org

Ideas for a Better Tomorrow