



Policy



Paper

E-Government in the Atlantic Provinces: Review and Future Trends

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By Jan Pavel

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Executive Summary

“E-government” refers to the delivery of government services on the internet.

Improving this capacity has become a priority for many countries and sub-national jurisdictions around the world. Motivations for adopting more e-government include streamlining bureaucracy and greater efficiency in service delivery; reducing government overhead and lowering regulatory compliance costs; promoting economic growth; and providing a more convenient relationship between people and the state services they require.

The provinces of Atlantic Canada have seen moderate progress in transferring government services to web-based delivery. These governments provide only a limited number of end-to-end online services, among them just a few of those frequently used by the public. Only Nova Scotia has made first attempts to bring e-government to the highest stage of sophistication.

By contrast, the small, Eastern European country of Estonia serves as a model. Despite its small population, remote geography and the legacy of Soviet rule, it is a world leader in online government services. Estonia has also pioneered the concept of e-residency, which allows foreigners to take advantage of the country’s advanced technology infrastructure and welcoming business environment. This is of particular benefit to businesses since Estonia is a member of the European Union (EU), a market of over 500 million consumers.

Might Atlantic Canada be able to leverage its membership in the North American Free Trade Agreement (NAFTA) and the Canada-EU Comprehensive Economic Trade Agreement (CETA) to offer similar services?

For a region that struggles with economic development, Atlantic Canada could learn much from Estonia’s innovations. With no advanced e-government jurisdiction in North America, investment in these tools combined with an e-government policy framework could provide a competitive advantage to Atlantic Canadian provinces, thereby improving their economies and the well-being of their residents.



Introduction

Online government services are increasingly routine in the developed world. Many of us prefer applying for a birth certificate or filing taxes over the Internet to submitting paper forms. Yet, it has not been long since the public debate was filled with warnings about poor online security and governments obtaining a powerful tool to survey our lives. These voices have quieted down for one reason or another. Today, we instead hear, “I hope I can do it online,” or increasingly, “Can I do it on my phone?” Our attitudes toward online usage of private data are changing almost as fast as the Internet itself. Our expectations have also changed. In light of these developments, this paper looks at how the four Atlantic Canadian provinces have kept up with trends in online services. As a benchmark, it uses the international example of Estonia as a case of successful and advanced online government services.

Online services, often referred to as “e-services,” are part of the concept known as “e-government.” In short, e-government is the use of information technologies — primarily the Internet — to deliver government information and services to the public in an efficient and transparent way. For more than ten years, international organizations and universities have been conducting surveys to assess the progress of countries in e-government. Thanks to these surveys, we know which countries are leaders and which countries are falling behind. In unitary states such as France, the Czech Republic, or Singapore, e-government functions are frequently undertaken by the national government or its branches. In federal states such as Canada, the United States, Australia, or Germany, provinces and states have extensive law-making and administrative powers that significantly define daily life, yet we know practically nothing about the state of e-government in such subnational units.

A functioning e-government is often equated with a lower bureaucratic burden on individuals and businesses, and, it is argued, the spurring of economic activity and growth. In this context, e-government surveys have become an important point of reference for governments that are striving to improve their jurisdiction’s competitiveness. The 2014 United Nations E-Government Survey ranked Canada eleventh in the world, while media magnet Estonia landed in fifteenth position (United Nations 2014). Does this mean that, for example, e-government in Atlantic Canada in 2014 was ahead of otherwise innovative Estonia? The answer is no, and by a substantial margin. Indeed, recently updated UN data rank Estonia 13th in the world in 2016, one spot ahead of Canada, which ranks 14th. (United Nations 2016). Although the UN survey’s research teams tended to include subnational levels, they did so only if the information or service could be found at the national level.



It would, therefore, be more appropriate to compare the development of e-government in the Atlantic provinces with that in subnational jurisdictions elsewhere, rather than with the situation in a unitary state such as Estonia. Nonetheless, the story of Estonia's e-government is a powerful one. It is an example of a small country with limited resources that could serve as a template for Atlantic Canada as an e-government underdog that has transformed into a high achiever. Estonia's online solutions have brought that country to the centre of the digital world, where most business almost certainly will be happening in the coming decades. Estonia thus could be the gateway into the digital world for many who plan to do business in Europe. This is a role that the Atlantic provinces also might aspire to play in North America — if they take the lead.



Methodology

Provincial rankings of e-government sophistication are not new. In 2012, the Stratford Institute for Digital Media published *Becoming a Digital Nation: An Evaluation of Provincial and Territorial eGovernment Initiatives* (Brainmaven Research 2012). That study has not been updated, however, and one could argue that a history of repeated evaluations based on the same methodology is needed to observe trends. For jurisdictions in the lead, it provides a sense of validation of the chosen path; for those falling behind, the feedback can be the necessary impulse for policymakers and elected officials to act.

The methodology employed in this paper derives its inspiration from both the Stratford Institute report and the UN e-government survey. From the Stratford Institute, the list of online services was copied (Table 1). (This report does not include that Institute’s list of online information and platforms of online engagement due to the narrow scope of this paper, which focuses on e-services alone.) By comparing the original sample and later findings, it was possible to determine what progress has been made in this area. In addition, new items were added to the original list to better cover the range of services that provincial governments provide to the public (Table 2).

TABLE 1	
E-Services in Stratford Institute Report	
1.	Acquire child care subsidy
2.	Reserve provincial park campground
3.	Apply for provincial student loan
4.	Apply for provincial government job
5.	Change address on driver’s licence
6.	Pay transportation fine
7.	Apply for personal certificates
8.	Acquire business registration
9.	Apply for operation permit
10.	Dissolve business registration

Source: Brainmaven Research (2012).



TABLE 2

Newly Included E-Services

1. Apply for vehicle permit renewal
2. Make driver's test payment
3. Acquire vehicle registration
4. Acquire driver's abstract
5. Apply for health card
6. Acquire health card renewal/replacement
7. Apply for health services reimbursement
8. Obtain transcript, diploma
9. Apply for scholarship
10. Apply for school (public college)
11. Access land registry
12. Execute lien check
13. Apply for teacher certification
14. Submit fuel tax
15. Submit tobacco tax
16. Participate in procurement
17. Submit provincial immigration program application
18. Register to vote
19. Obtain workers' compensation board letter
20. Acquire fishing permit
21. Acquire hunting permit

Source: Brainmaven Research (2012).

The second source of the methodology used the definition of e-services employed by the UN survey, which is arguably the most reputable assessment of e-governments currently available and has been published biannually since 2001. The UN survey identifies four stages of e-services, each representing a higher level of e-service sophistication (see Figure 1, page 11):

Stage 1 Emerging information services

Government websites provide information on public policy, governance, laws, regulations, relevant documentation and types of government services provided. They have links to ministries, departments and other branches of government. Citizens are able to obtain updated information in the national government and ministries and can follow links to archived information.

Stage 2 Enhanced information services

Government websites deliver enhanced one-way or simple two-way e-communication between government and citizen, such as downloadable forms for government services and applications. The sites have audio and video capabilities and are multi-lingual. Some limited e-services enable citizens to submit requests for non-electronic forms or personal information.

Stage 3 Transactional services

Government websites engage in two-way communication with their citizens, including requesting and receiving inputs on government policies, programmes, regulations, etc. Some form of electronic authentication of the citizen's identity is required to successfully complete the exchange. Government websites process non-financial transactions, e.g. filing taxes online or applying for certificates, licences and permits. They also handle financial transactions, i.e. where money is transferred on a secure network.

Stage 4 Connected services

Government websites have changed the way in which governments communicate with their citizens. They are proactive in requesting information and opinions from the citizens using Web 2.0 and other interactive tools. E-services and e-solutions cut across the departments and ministries in a seamless manner. Information, data and knowledge is transferred from government agencies through integrated applications. Governments have moved from a government-centric to a citizen-centric approach, where e-services are targeted to citizens through life cycle events and segmented groups to provide tailor-made services. Governments create an environment that empowers citizens to be more involved with government activities to have a voice in decision-making. (United Nations 2014, 195)

In general terms, end-to-end e-services in Stage 3 and connected e-services in Stage 4 are what e-government should be about, making dealings with government as easy as possible. Ideally, users should be able to complete e-services online from start to finish.

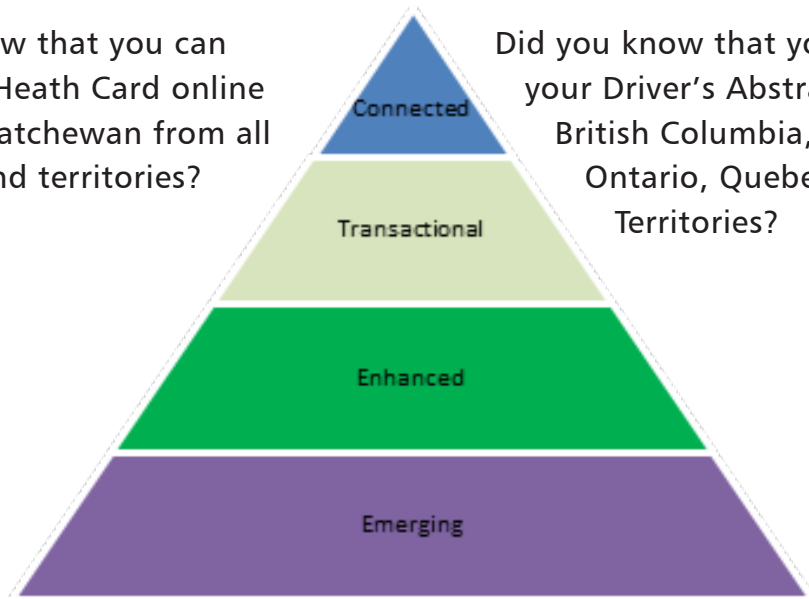


FIGURE 1

The Four Stages of Online Service Development

Did you know that you can apply for a Health Card online only in Saskatchewan from all provinces and territories?

Did you know that you can get your Driver's Abstract online in British Columbia, Saskatchewan, Ontario, Quebec and Northwest Territories?



Source: United Nations (2014, 195).

The UN survey's definition of stages was chosen to enable comparisons between the Atlantic provinces and other countries. Such comparisons are limited, due to the lack of detail the UN survey provides on the criteria for each stage and the number of services examined, yet is the right direction to take. Future access to the detailed UN survey methodology would enable the public and governments to make direct comparisons with other countries and provinces at the same time. In this regard, the Stratford Institute's survey allows comparisons only within the examined sample of provinces and other selected jurisdictions. In its survey, the Stratford Institute uses a three-tier system to evaluate the sophistication of e-services. In this system, Tier 1 is the equivalent of the combined Stages 1 and 2 in the UN survey; Tier 2 is equivalent to the UN's Stage 3, and Tier 3 is rather similar to Stage 4. In order to make comparisons, I have used Tier 2, which examines whether the websites allow the full submission of an application online.

The research in this paper shares with both the Stratford Institute and UN surveys a user-oriented approach, meaning that, in testing individual e-services, this author acted as a standard user of government websites. (For a complete overview see Appendix A.) First, I attempted to find a service starting at the main provincial government website. I then selected one or more of the service tabs, which could contain the information, using service lists or an internal search engine. Finally, if I could not find the service



directly on the government website, I used an external search engine (such as google.ca). If I still could not find the information, I considered the service non-existent.

I examined all evaluated services on an individual basis, with the exception of “operational permits,” which I assessed as the bulk of all permits. In the rankings, each service could qualify for one or more of the UN survey’s four stages of e-government and be attributed 1 point for each stage. If the service did not qualify for a stage, it was given zero points. For example, some e-services qualified for both Stage 1 and Stage 3, as they provided some basic information about the service and allowed the entire request to be completed online, but they did not provide an efficient means of communication with the department and thus lost a point for Stage 2.

As for operational permits, the Stratford Institute report does not elaborate on what permits were included in its original assessment. Thus, to attribute the right weight to the number of permits available online, I created and tested the following business scenario. Since all four Atlantic provinces use BizPal.ca as the search tool for operational permits, I ran an identical search for an imaginary company in each of the four provinces and calculated the percentage of services/permits that were available online. From the total, I excluded only those services that appeared separately in the sample, such as business registration. The resulting percentage was converted into a decimal number (for example, 25 percent = 0.25), which represents a point or a fraction of a point attributed for the bulk of services/permits. In other words, if only 25 percent of services were available online, the province met only 25 percent of what was required to obtain a full point in Stage 3 and therefore received 0.25 of a point in that stage. When the assessment was complete, I calculated the total number of points for each stage and the percentage of online services. The overall score is the sum of weighted scores for each stage — namely, 25 percent for Stage 1, 50 percent for Stage 2, 75 percent for Stage 3, and 100 percent for Stage 4. The data collection was conducted in January and February 2016. (For the complete data collection, see Appendix A.)

Apart from the four stages, I looked at how easy or difficult it was to navigate through the government websites. Most such sites organize services in tabs specifically designated to “Residents,” “Business,” “Government,” “Visitors,” or “Youth.” In addition, some websites provide general quick links or alphabetical lists of all services. Finally, internal search engines complement the options available. For each e-service examined, I marked what website feature helped me to locate it. I anticipated that, if I found a service under one of the thematic tabs, this added convenience to users. On the other hand, if I had to use the internal search engine, I anticipated that convenience would be reduced. To provide depth to the findings, I offer a subjective impression of how



easy or difficult it was to find the service. For example, a service under the “Residents” tab might not have been found easily, but instead might have required many clicks to navigate through subcategories, and the path toward the service location was not obvious at first. In such case, I attributed an impression of “moderate” ease in finding the service; in specifically confusing situations, I attributed an impression of “difficult” for the assessment. On the other hand, some internal search engines provided the relevant information in the first three search results, and were attributed an impression of “easy” for the navigation value. (See Appendix B.)

Finally, I looked at the availability of a mobile phone website format known as Mobile Web, which is “designed for the small screens of smartphones. Queries to a Web site include the type of browser being used, and when a request from a mobile browser is made, the site redirects it to its mobile counterpart (if there is one) for a more convenient surfing experience. Although any regular Web page can be scrolled in a mobile browser, it is much easier to read a page formatted for a tiny screen” (PCMag, n.d.). I marked the results of this search “Yes” for the complete presence of the Mobile Web format and “No” for a regular website format. In some cases, the Mobile Web format was present for the service, but some navigational steps toward the e-service were in the regular website format. (See Appendix B.)



Results

The survey assessed 31 services. All services had to be within provincial jurisdiction and were selected to cover the main areas of life, such as health, business, social affairs, education, vehicle operation, entertainment, and immigration (see Table 3).

Overall, Nova Scotia ranked first, followed (in order) by New Brunswick, Newfoundland and Labrador, and Prince Edward Island. Nova Scotia was the leader among the provinces with the most e-services in Stage 1 (shared with New Brunswick), transactional services in Stage 3, and as the only province with any connected e-services in Stage 4. The differences among the provinces in the number of e-services in Stage 3 were rather narrow. Nova Scotia led with 45.87 percent of e-services (14.22 e-services), followed by New Brunswick with 45.35 percent (14.06 e-services), Newfoundland and Labrador with 42.06 percent (13.04 e-services), and Prince Edward Island with 35.58 percent (11.03 e-services).

Among the examined services, some were clearly prioritized, and in all four provinces were made available as end-to-end Stage 3 e-services. Among these were applications for birth or marriage certificates, student loans, government jobs, park campsite reservations, public college programs, vehicle permit registration renewals, and lien checks. In three out of the four provinces, the public could pay traffic fines or apply for a Workers' Compensation Board (WCB) clearance letter online. Although one expected that the four provinces would want to encourage business creation by reducing administrative barriers, only two make it possible to incorporate a business online, and one of these is in question due to technical difficulties.

TABLE 3										
Ranking of E-Services by Province, Atlantic Canada (Sample of 31 Services)										
Rank	Overall Ranking		Stage 1		Stage 2		Stage 3		Stage 4	
	Province	Weighted Score	Province	%	Province	%	Province	%	Province	%
1	NS	33.14	NS	100	NB	90.32	NS	45.87	NS	10.39
2	NB	32.30	NB	100 (shared 1st)	PEI	87.50	NB	45.35	NB	0
3	NL	29.78	NL	96.77	NL	80.65	NL	42.06	NL	0
4	PEI	29.27	PEI	96.77 (shared 2nd)	NS	74.19	PEI	35.58	PEI	0

Source: Author's compilation.

Business operational permits is also an area where few end-to-end e-services are available. Part of the sample examined one bulk service by testing the availability of online operational permit applications through a business scenario on Bizpal.ca.¹ The results showed that a rather low number of permits/registrations can be obtained online. Nova Scotia, for example, allows only seven out of thirty-two permits to be completed online, while the remaining provinces enable the applicant to complete only one permit/registration online end-to-end (see Table 4).

TABLE 4				
Operational Permits/Registrations Online by Province, Atlantic Canada				
Rank	Province	City	Total Number of Provincial Permits/ Registrations	Number of Permits/ Registrations Available to Submit Online
1	NS	Halifax	32	7
2	NL	St. John's	25	1
3	NB	Fredericton	15	1
4	PEI	Charlottetown	32	1

Source: Author's compilation.

Finally, several services — such as applications for a health card, driver's licence, childcare subsidies, school transcripts, or registration to vote — had not been turned into a fully transactional e-service in any of the provinces.

Nova Scotia

Nova Scotia is the province with the most e-services that may be fully completed online. Out of thirty-one examined services, fourteen are transactional, Stage 3 e-services. The level of sophistication of these e-services, however, varies substantially. On the one hand, there are simple but practical e-services, such as those designed to apply for a copy of a birth certificate or to pay a traffic fine. On the other hand, Nova Scotia has e-services for obtaining a student loan or accessing the land registry, which require a user name and password. These e-services are also convenient in that they maintain information about the user in that specific area. None of these services can be considered Stage 4 e-services, however, as the data users provide are not shared across departments to assist with completion of other services; login information also differs from one e-service to another, thus preventing a seamless user experience. In the case of the land registry, user convenience was compromised by the requirement to submit a paper application to gain online access.

1. In this scenario, I pretended to open a full-service restaurant in each province's capital city. I then reviewed the proposed provincial operational permits for their online availability.



Despite these drawbacks, Nova Scotia is the only province that offers at least some degree of integration of e-services (Stage 4). The province's e-government flagship is its account for businesses, where aspiring or existing business owners can open an account on the government's main portal and access several e-services and information about off-line services in one place. The site's function for operational permits is powered by Bizpal.ca, which enables users to conduct company- or industry-specific searches for relevant business permits, some of which, as noted above, can be completed online. The account allows users to track all existing business permits and their expiry dates, which adds to users' convenience. From the same account, the employer can complete a request for approval to hire a foreign national through the provincial nominee program, apply for a WCB clearance letter, or sign up for procurement notifications. Although these services certainly are in the right direction, only a few are true online end-to-end services. Surprisingly, business registration/incorporation is still an offline service in the province.

Interestingly, Nova Scotia is the only Atlantic province that enables its website users to change their address in multiple government departments with a single submission, even though this function has been promoted as an example of how e-government can improve a person's experience when dealing with government.

Among the four provinces, Nova Scotia's main website is the only one-stop-shop portal, using the Mobile Web format. With random interruptions during the site navigation, twelve government services were available in this format. Overall, Nova Scotia's effort to make its website design as simple as possible makes some information a bit harder to find. To locate information, the website's internal search engine was used most frequently among the four provinces (thirteen instances). This approach might cause difficulties, however, for users not certain about the exact name of the services they are looking for. Still, the (subjective) experience of finding information on Nova Scotia's website was the easiest among the four provinces.

New Brunswick

New Brunswick, which ranked second overall, had fourteen e-services in Stage 3, the same number as Nova Scotia. However, it allowed only one operational permit/registration to be completed online, compared with seven in the latter's case — although the number of government permits and registration forms required is significantly lower in New Brunswick, which is certainly a beneficial growth-oriented attribute. Nova Scotia also had an edge over New Brunswick in its Stage 4 e-services.

The highlight of New Brunswick's e-government services is the ability to incorporate a



business online. Although this e-service has a rather basic interface, it is functional, and makes starting a business significantly easier. In Nova Scotia and Prince Edward Island, in contrast, business registration is possible only via paper forms. New Brunswick's best e-service is likely its procurement website, which, unique among the Atlantic provinces, offers electronic bidding on selected procurement opportunities. Unlike Nova Scotia, New Brunswick has no end-to-end e-services for changing a person's address or paying for a driver's test; however, one can apply for a fishing or hunting licence online.

The single biggest detriment to the user experience is that the province's home page (www2.gnb.ca) is not always seamlessly connected to the Service New Brunswick website (www.snb.ca), where many online and offline services are located. Users in search of a particular service thus might not find the information they require on one or the other website, and could become discouraged quickly. On the other hand, the navigation tabs on both websites are much more detailed than in the case of Nova Scotia, and the internal search engine was used in only ten instances. The Mobile Web format is rarely used on New Brunswick government sites. This format was encountered only with e-services for park campsite reservations, traffic fine payments, and for applications to become a student at the New Brunswick Community College. My subjective impression is that navigation on New Brunswick sites is marginally more difficult than on Nova Scotia sites.

Newfoundland and Labrador

Newfoundland and Labrador, which secured third place in the survey, has thirteen Stage 3 e-services, closely behind New Brunswick and Nova Scotia in this subcategory, but no Stage 4 e-services. Most of the province's end-to-end e-services are similar to those in other provinces, with the exception of fuel and tobacco tax, which may be submitted online via the e-filing function; unfortunately, one needs to submit a paper application to receive login information. Persistent technical difficulties, however, rendered it impossible to submit a business incorporation request online despite the province's claimed ability to provide such an e-service. Moreover, online business incorporation is available (if at all) only to applicants located in the province.

The main Newfoundland and Labrador website is one of the most elegantly designed of the four provinces' sites. The internal search engine was used only eight times, although navigation through the site was not always easy. Locating services and information on the Newfoundland and Labrador site is more complicated than on any of the other three provinces' sites.



Prince Edward Island

For Prince Edward Island, which ranked last among the four provinces, eleven Stage 3 e-services were identified. As well, one operational permit application could be completed online from start to finish. This is not largely different from the other three provinces, but none of Prince Edward Island's Stage 3 e-services exceeds the standard set by the others.

Prince Edward Island's strongest e-government feature is primarily its Stage 2 e-services. Plentiful information on the service pages, downloadable forms, and clear submission instructions guide potential users. In addition, the quality of the content was perceived to be superior to what is available in Newfoundland and Labrador and even Nova Scotia. Users of the main government website (www.gov.pe.ca) have several service tabs from which to choose — notably, the "A to Z All Services Tab" under the Resident Tab provides a useful tool to locate services and information. The internal search engine was used in only five instances. Overall, the ease of navigation was slightly below that in Nova Scotia and New Brunswick, mainly due to the difficulty of locating services in subsections of tabs and in those few instances the internal search engine was used.

E-services over Time

The Stratford Institute survey provides all the raw data it collected in 2012. Although its ranking of e-services does not follow precisely the UN survey's four-stage format, its data matches the provincial data that was collected. This allowed progress to be assessed between March 2012, when the Stratford Institute completed its research, and February 2016, when provincial data was collected.

Compared with the provincial rankings of ten original services examined in the 2012 Stratford Institute survey, Nova Scotia continued to rank first among the four Atlantic provinces, mainly due to its e-services in Stage 4 (see Table 5). However, Newfoundland and Labrador replaced New Brunswick in second place, having the most e-services in Stage 3 among the four provinces, while New Brunswick moved from second to third. Prince Edward Island ranked the highest in Stage 2 e-services, but, as in 2012, ranked fourth overall.



TABLE 5										
Ranking of E-Services by Province, Atlantic Canada (Sample of 10 Services)										
Rank	Overall Ranking		Stage 1		Stage 2		Stage 3		Stage 4	
	Province	Weighted Score	Province	%	Province	%	Province	%	Province	%
1	NS	12.39	NS	100	PEI	90	NL	70.40	NS	12.20
2	NL	11.78	NL	100	NS	80	NS	62.20	NB	0
3	NB	10.55	NB	100	NL	80 (shared 2nd)	NB	60.60	NL	0
4	PEI	10.02	PEI	100	NB	70	PEI	40.30	PEI	0

Source: Author's compilation.

As Table 6 (next page) shows, Nova Scotia, the leader of the 2012 Stratford Institute assessment, had not introduced any new Stage 3 e-services as of my 2016 survey. In fact, two of the services marked in 2012 as fully online end-to-end e-services were no longer available. First, business registration, except for business name search and reservation, remains an offline service in Nova Scotia. Second, although the Stratford Institute report marks operational permits as fully transactional e-services and provides a link to Bizpal.ca, only a small percentage of permits and registrations are fully online Stage 3 e-services in Nova Scotia. In the past four years, Newfoundland and Labrador has added the most Stage 3 e-services (three), which also led to its improved ranking in 2016. Prince Edward Island and New Brunswick each added two new Stage 3 e-services. Interestingly, childcare subsidies and business dissolution remain untouched by any effort to bring them to Stage 3 in any of the four provinces.

TABLE 6					
E-Services by Province, Atlantic Canada, March 2012 and February 2016					
Service	Date	NS	PEI	NL	NB
		Full Online Submission			
Acquire child care subsidy	March 2012 February 2016	No No	No No	No No	No No
Reserve provincial park campground	March 2012 February 2016	Yes Yes	Yes Yes	Yes Yes	No Yes
Apply for provincial student loan	March 2012 February 2016	Yes Yes	No Yes	Yes Yes	Yes Yes
Apply for provincial government job	March 2012 February 2016	Yes Yes	Yes Yes	Yes Yes	Yes Yes
Change address on driver's licence	March 2012 February 2016	Yes Yes	No No	No Yes	No No
Pay transportation fine	March 2012 February 2016	Yes Yes	Yes* Error Municipal No	No Yes	Yes Yes
Apply for personal certificate	March 2012 February 2016	Yes Yes	No Yes	No Yes	Yes Yes
Acquire business registration	March 2012 February 2016	Yes* Error Not Online No	No No	Yes Yes	No Yes
Apply for operation permit	March 2012 February 2016	Yes Yes (22%)	Yes Yes (3%)	Yes Yes (4%)	Yes Yes (6%)
Dissolve business registration	March 2012 February 2016	No No	No No	No No	No No

Source: Author's compilation.

Source: Author's compilation.



Canada's Standing in the World

Table 7 shows the e-government rankings of the top twenty-five countries as determined by the 2014 UN survey based on their scores in online services. (This report highlights 2014 data from the UN because the 2016 data does not include the ranking of the four e-government stages.) Although Atlantic provinces data cannot be compared directly with these country scores, one can nonetheless draw several conclusions from the UN rankings. First, nearly all of the e-services offered in the top-ranked countries are in either the transactional Stage 3 or the integrated Stage 4. Second, the majority of the

Rank Online	Rank UN Overall Standing	Country	Population (Millions)	Gross Domestic Product per capita (US\$ Thousands)	Stage 1	Stage 2	Stage 3	Stage 4	UN Average
1	4	France	66.6	41.4	100	73	91	91	88
2	3	Singapore	5.7	85.7	100	89	88	71	87
3	1	South Korea	49.1	36.7	100	82	77	88	86
4	7	United States	321.4	56.3	100	68	77	94	83
5	6	Japan	126.9	38.2	97	73	79	88	83
6	12	Spain	48.1	35.2	100	93	70	71	83
7	5	Netherlands	16.9	49.3	100	75	70	88	82
8	18	Bahrain	1.3	51.2	94	80	84	74	82
9	2	Australia	22.7	65.4	100	75	88	65	82
10	11	Canada	35.1	45.9	100	73	84	68	80
11	8	United Kingdom	64.1	41.2	100	73	63	88	79
12	32	United Arab Emirates	5.8	67.0	100	77	67	71	78
13	17	Israel	8.0	34.3	91	64	42	53	77
14	9	New Zealand	4.4	36.4	97	66	84	53	75
15	26	Uruguay	3.3	21.8	94	70	72	68	75
16	33	Chile	17.5	23.8	100	57	70	71	73
17	50	Colombia	46.8	14.0	88	75	56	65	70
18	15	Estonia	1.3	28.7	100	66	56	59	69
19	10	Finland	5.5	41.2	100	70	47	65	69
20	36	Saudi Arabia	27.8	54.6	100	66	56	59	69
21	13	Norway	5.2	68.4	97	77	44	56	67
22	28	Kazakhstan	18.2	24.7	94	45	77	56	67
23	29	Lithuania	2.9	28.0	94	70	49	62	67
24	20	Austria	8.7	47.5	100	75	51	44	67
25	23	Italy	61.9	35.8	97	66	51	59	67

Source: United Nations (2014); United States (n.d.).



high performers are affluent countries. Third, most high performers are countries with at least five million inhabitants.

The exception is Estonia, which aside from tiny and wealthy Singapore, is the least populous country among the top twenty 2016 performers in e-services. It is also rather less affluent than others in the top group, yet it has managed to place among them on a regular basis since 2003 — Estonia 2016 UN ranking is 13th. Estonia is, in fact, an appropriate example for the Atlantic provinces. Its population (1.26 million) is comparable to that of Nova Scotia (942,000) and, as Table 10 shows, its gross domestic product and government budget — including items that would be paid by the federal government in Canada — are at levels that allow one to draw parallels with the Atlantic provinces. The point is that even countries or provinces with resources that are not comparable with those of France or the United Kingdom can be top innovators and trend-makers, and can build e-government that is globally competitive.

Rank, UN Overall Standing	Country	Rank, UN Overall Standing	Country
1	United Kingdom	14	Canada
2	Australia	15	Germany
3	South Korea	16	Austria
4	Singapore	17	Spain
5	Finland	18	Norway
6	Sweden	19	Belgium
7	Netherlands	20	Israel
8	New Zealand	21	Slovenia
9	Denmark	22	Italy
10	France	23	Lithuania
11	Japan	24	Bahrain
12	United States	25	Luxembourg
13	Estonia		

Source: United Nations (2014, 2016).

TABLE 9		
E-Government Ranking, Estonia, 2013-15		
	UN Government Survey Rank	Waseda University Rank
2003	16	-
2004	20	-
2005	19	-
2006	-	-
2007	-	-
2008	13	-
2009	-	-
2010	20	14
2011	-	8
2012	20	19
2013	-	19
2014	15	7
2015	-	8

Source: United Nations (2014); Waseda University.

TABLE 10				
Economic Indicators, Atlantic Provinces and Estonia				
Province/Country	Population	Gross Domestic Product, 2014 (US\$ Billions)	Gross Domestic Product per capita, 2014 (US\$ Thousands)	Provincial/National Government Budget, 2015 (US\$ Billions)
Nova Scotia	942,400	35.4	37.6	6.9
New Brunswick	754,600	29.0	38.5	6.0
Newfoundland and Labrador	521,800	30.4	57.8	5.1
Prince Edward Island	146,200	5.4	37.2	1.2
Estonia	1,265,420	37.9	28.7	8.7

Source: Statistics Canada (2015a, 2015b); United States (n.d.).

Next Steps: Lessons from Estonia

“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” (Rooney 2012). This quote from the *Wall Street Journal* only touches on some of Estonia’s many accomplishments since regaining its independence from



the Soviet Union in 1991. A country that twenty-five years ago found itself with limited financial resources and almost no industry to build upon has since been dubbed a “Baltic Tiger,” and has managed to become a leader in information technologies and innovative public policies. Skype, perhaps the best-known Estonian company, is just one of many successful innovative firms that have given Estonia its second name: Start-up Nation.

E-government, however, is not only about providing better service to the public; it is also about changing government infrastructure and enabling both the private sector and the public to be part of this change. In a small country such as Estonia, government encouragement and spending on e-government is creating new clusters of information technology industries that eventually gain a life of their own. Estonia quickly embraced modern technologies: as early as 2000, an e-Tax Board allowed taxpayers to file their taxes online; by 2011, 94 percent of the country’s tax declarations were filed online (Rooney 2012). In 2001, X-Road, the backbone of Estonia’s e-government, was implemented to connect online applications with numerous national databases (Järv 2006). In 2003, the country’s one-stop-shop portal (www.eesti.ee) was launched to concentrate all e-services in one place.

No advanced e-services would be possible, however, without secure access to the system. Originally, access was facilitated through secure bank certificates home-developed in the early 1990s (Viik et al. 2011). The true revolution came with the implementation of electronic identification cards, which are mandatory for all Estonian citizens and permanent residents over fifteen years of age. The cards also function as a digital signature, which is legally binding. Similar to an ID card, one can also use Mobile ID, integrated into a smartphone’s SIM card, to access online services and to sign digital

documents (Pavel 2013). Having secure access to one's personal data has opened up enormous opportunities for e-government in Estonia. One of its biggest achievements is I-voting: in 2005, Estonia became the first country in the world to use Internet voting for political elections in municipalities; in 2007, it was first to allow I-votes to be cast for parliamentary elections. In the 2015 parliamentary elections, 30.5 percent of participating voters cast their votes on the Internet (Vabariigi Valimiskomisjon n.d.).

E-health is another sophisticated online service that benefits from secure access for everyone. Introduced in 2008, the service integrates data from Estonia's health care providers to form an inclusive record for each patient. Patients and doctors can access records and see them in a single electronic file. Records also contain image files such as x-rays. In an emergency, a doctor can use the patient's ID card to read time-critical information such as blood group, allergies, recent treatments, ongoing medication, or pregnancy (e-Estonia.com n.d.). E-prescription then completes the system, allowing patients to pick up their medication with their ID card.

Estonia's secure e-government ecosystem has also been used to create e-school, to connect teachers, students, and parents; e-cabinet, to create paperless government; e-notary, to provide secure and efficient features to complete the tasks required of a notary; and e-law, to enable citizens to participate in the legislative process. These are just some of the hundreds of examples of e-services Estonia offers on its one-stop-shop portal (Petersoo 2012).

The Atlantic provinces, in contrast, offer at best a few dozen end-to-end e-services. One might argue that all these e-services are excellent demonstrations of technology, but is the return on the investment sufficient to justify their development? Would a province as small as Prince Edward Island be able to turn this infrastructure into a net benefit? Countless discussions have taken place about the concrete benefits of e-government, ranging from e-government as a driver of innovation to simple cost savings in government operations, and there are also dissenting voices about such correlations. At the end of the day, however, progress goes on – just as paper and ink were replaced by typewriters and later by computers, so computerized but manually triggered requests for services will be replaced by online self-serve e-services.

Going beyond the transformation of existing government services into online e-services, technology is allowing unforeseen new opportunities to open up. Here, Estonia shows the way once again. In December 2014, the country became the first to launch an e-residency portal (Trade with Estonia n.d.), which enables both citizens and resident foreigners to benefit fully from the country's advanced e-government. E-residency has nothing to do with constitutional rights or actual citizenship; rather,



it is mainly about business (Shabbir 2014). With an Estonian ID card, one can sign documents in minutes, establish a company within an hour, make euro and other currency bank transfers within seconds, participate actively in the management of a company registered in Estonia, or submit tax returns with a few mouse clicks. The Estonian government designed e-residency so that people outside the European Union could create a central base for their business in Estonia, and thereby access the entire EU market, even if they reside in, say, Brazil or Australia (Estonia n.d.). Overall, e-residents can benefit from minimal bureaucracy and a straightforward tax system while being included in the EU's legal framework. In addition, companies can benefit from an increased perception of trustworthiness as a result of their being registered in the EU (e-Estonia.com n.d.b). As Daniel Schwarz (2016) explains, "E-residency is the solution for the digital era." One year after the launch of e-residency, 7,600 people from 121 countries had applied for the program and were using Estonian e-services, e-residents had created 240 new companies, and 530 entrepreneurs were using e-residency to administer their companies (Aasmae 2016). Estonia is planning to attract around 10 million "digital citizens" by 2025 (Shabbir 2014). Just as one may change one's bank if not satisfied with its services, so the Estonian government hopes that businesses will switch to a country with an infrastructure that is easier to use. Estonia welcomes foreign entrepreneurs who want to open a business in Estonia, use Estonian banks, and pay for some Estonian services even if they do most or all of their business elsewhere, and who would choose Estonia simply because its government infrastructure is easier to deal with than the one in their home country.

In this context, it is easy to imagine any of the Atlantic provinces becoming the gateway for Canada and possibly all of North America if similar infrastructure were available. The example of Estonia demonstrates that, to become a superpower in the digital world, a country or region does not have to have a large population and a massive budget; rather, it is more important to have a policy framework that includes a concrete, ambitious, long-term vision. Nowhere in North America has yet followed the Estonian example, so here is an opportunity for a jurisdiction prepared to differentiate itself from the rest. Investment in leading-edge e-government, apart from the material benefits it would provide, would also affect the mindsets of both government and the public. As in Estonia, innovative approaches to e-solutions could generate a feeling of self-investment in the success of the project.



Conclusion

The governments of Nova Scotia, New Brunswick, Newfoundland and Labrador, and Prince Edward Island provide only a limited number of end-to-end online services, among them just a few of the most frequently used government services. Only in Nova Scotia, which scores the highest among the four provinces, are we seeing the first attempts to bring e-government services to the highest stage of sophistication, which generally corresponds to improved user convenience. An effort should be made to conduct a comprehensive assessment of e-government in all Canadian provinces and territories in the near future, possibly with access to the UN's E-Government Survey methodology. This would allow comparisons with other countries and, one hopes, trigger healthy competition for improved e-government. Inspiration could come from examples such as Estonia. If the Atlantic provinces were to embrace the innovative potential of e-government, it would positively change the region's outlook with respect not only to the delivery of government services, but also its economy and the well-being of Atlantic Canadians. The governments of the four Atlantic provinces thus should adopt plans and implement measures to outperform other provinces and territories in the provision of e-services and seize the opportunity to take their place among e-government leaders worldwide.



Recommendations

1. Atlantic governments should adopt long-term strategies in order to implement a secure and unified access to all transactional e-services. This is a stepping stone for advancement to more sophisticated e-services.
2. Commit to gradually bring additional services to the transactional stage. This should be a part of the overall effort to develop citizen- and business-friendly e-government infrastructure that is competitive Canada-wide.
3. Foster e-government cooperation among Atlantic Provinces, such as joint development of e-service solutions or promotion of mutual business activity by enabling access to each other's government e-services with one secure form of online identification.
4. Create a system of annual or biennial reviews consisting of inward-oriented benchmarks and outward-oriented comparisons with leaders in e-government.

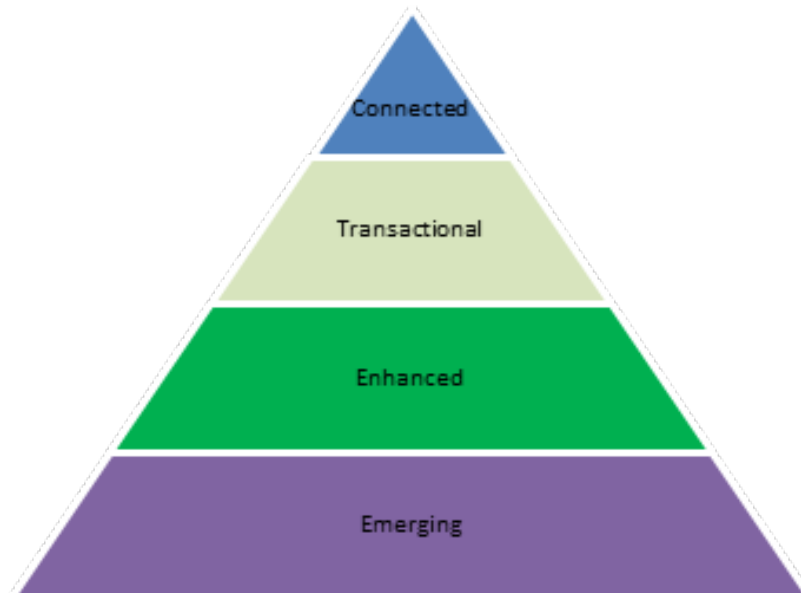


Appendix A

Stages of E-Services - Data Sheets

FIGURE 1

The Four Stages of Online Service Development



Source: United Nations (2014, 195).

Evolutionary Stages of E-Services

TABLE A1					
Nova Scotia					
	Service	Stage 1	Stage 2	Stage 3	Stage 4
Small sample: original 10 services examined by the Stratford Institute for Digital Media	1. Acquire child care subsidy	1	1	0	0
	2. Reserve provincial park campground	1	1	1	0
	3. Apply for provincial student loan	1	1	1	0
	4. Apply for provincial government job	1	1	1	0
	5. Change address on driver's licence	1	1	1	1
	6. Pay transportation fine	1	0	1	0
	7. Apply for personal certificates	1	0	1	0
	8. Acquire business registration	1	1	0	0
	9. Apply for operation permit	1	1	0.22	0.22
	10. Dissolve business registration	1	1	0	0
	Total score (10 services)	10	8	6.22	1.22
	Percentage (10 services)	100	80	62.2	12.2
	Weighted score (10 services)	2.5	4	4.665	1.22
	Total weighted score (10 services)	12.39			
Large sample Newly added services	11. Apply for vehicle permit renewal	1	0	1	0
	12. Make driver's test payment	1	1	1	0
	13. Acquire vehicle registration	1	1	0	0
	14. Acquire driver's abstract	1	1	0	0
	15. Apply for health card	1	0	0	0
	16. Acquire health card renewal/replacement	1	1	0	0
	17. Apply for health services reimbursement	1	1	0	0
	18. Obtain transcript, diploma	1	1	0	0
	19. Apply for scholarship	1	1	0	0
	20. Apply for school (public college)	1	1	1	0
	21. Access land registry	1	1	1	0
	22. Execute lien check	1	0	1	0
	23. Apply for teacher certification	1	0	1	0
	24. Submit fuel tax	1	1	0	0
	25. Submit tobacco tax	1	1	0	0
	26. Participate in procurement	1	1	0	0
	27. Submit provincial immigration program application	1	1	1	1
	28. Register to vote	1	1	0	0
	29. Obtain workers' compensation board letter	1	1	1	1
	30. Acquire fishing permit	1	0	0	0
	31. Acquire hunting permit	1	0	0	0
	Total score (31 services)	31	23	14.22	3.22
	Percentage (31 services)	100	74.19	45.87	10.39
	Weighted score (31 services)	7.75	11.5	10.665	3.22
	Total weighted score (31 services)	33.14			

Source: Author's compilation.

TABLE A2						
New Brunswick						
	Service	Stage 1	Stage 2	Stage 3	Stage 4	
Small sample: original 10 services examined by the Stratford Institute for Digital Media	1. Acquire child care subsidy	1	1	0	0	
	2. Reserve provincial park campground	1	1	1	0	
	3. Apply for provincial student loan	1	1	1	0	
	4. Apply for provincial government job	1	1	1	0	
	5. Change address on driver's licence	1	0	0	1	
	6. Pay transportation fine	1	0	1	0	
	7. Apply for personal certificates	1	0	1	0	
	8. Acquire business registration	1	1	1	0	
	9. Apply for operation permit	1	1	0.06	0	
	10. Dissolve business registration	1	1	0	0	
	Total score (10 services)	10	7	6.06	0	
	Percentage (10 services)	100	70	60.6	0	
	Weighted score (10 services)	2.5	3.5	4.545	0	
	Total weighted score (10 services)	10.55				
Large sample	Newly added services	11. Apply for vehicle permit renewal	1	1	1	0
		12. Make driver's test payment	1	1	0	0
		13. Acquire vehicle registration	1	1	0	0
		14. Acquire driver's abstract	1	1	0	0
		15. Apply for health card	1	1	0	0
		16. Acquire health card renewal/replacement	1	1	0	0
		17. Apply for health services reimbursement	1	1	0	0
		18. Obtain transcript, diploma	1	1	0	0
		19. Apply for scholarship	1	1	0	0
		20. Apply for school (public college)	1	1	1	0
	21. Access land registry	1	1	1	0	
	22. Execute lien check	1	1	1	0	
	23. Apply for teacher certification	1	1	0	0	
	24. Submit fuel tax	1	1	0	0	
	25. Submit tobacco tax	1	1	0	0	
	26. Participate in procurement	1	1	1	0	
	27. Submit provincial immigration program application	1	1	0	0	
	28. Register to vote	1	1	0	0	
	29. Obtain workers' compensation board letter	1	1	1	1	
	30. Acquire fishing permit	1	1	1	0	
	31. Acquire hunting permit	1	1	1	0	
	Total score (31 services)	31	28	14.06	0	
	Percentage (31 services)	100	90.32	45.35	0	
	Weighted score (31 services)	7.75	14	10.545	0	
	Total weighted score (31 services)	32.30				

Source: Author's compilation.



TABLE A3					
Newfoundland and Labrador					
	Service	Stage 1	Stage 2	Stage 3	Stage 4
Small sample: original 10 services examined by the Stratford Institute for Digital Media	1. Acquire child care subsidy	1	1	0	0
	2. Reserve provincial park campground	1	1	1	0
	3. Apply for provincial student loan	1	1	1	0
	4. Apply for provincial government job	1	1	1	0
	5. Change address on driver's licence	1	0	1	1
	6. Pay transportation fine	1	1	1	0
	7. Apply for personal certificates	1	1	1	0
	8. Acquire business registration	1	1	1	0
	9. Apply for operation permit	1	1	0.04	0
	10. Dissolve business registration	1	0	0	0
	Total score (10 services)	10	8	7.04	0
	Percentage (10 services)	100	80	70.04	0
	Weighted score (10 services)	2.5	4	5.28	0
	Total weighted score (10 services)	11.78			
Large sample Newly added services	11. Apply for vehicle permit renewal	1	1	1	0
	12. Make driver's test payment	1	1	1	0
	13. Acquire vehicle registration	1	1	0	0
	14. Acquire driver's abstract	1	1	0	0
	15. Apply for health card	1	1	0	0
	16. Acquire health card renewal/replacement	1	1	0	0
	17. Apply for health services reimbursement	1	1	0	0
	18. Obtain transcript, diploma	1	1	0	0
	19. Apply for scholarship	1	0	0	0
	20. Apply for school (public college)	1	1	1	0
	21. Access land registry	1	1	0	0
	22. Execute lien check	1	0	1	0
	23. Apply for teacher certification	1	1	0	0
	24. Submit fuel tax	1	1	1	0
	25. Submit tobacco tax	1	1	1	0
	26. Participate in procurement	1	1	0	0
	27. Submit provincial immigration program application	1	1	0	1
	28. Register to vote	0	0	0	0
	29. Obtain workers' compensation board letter	1	1	0	0
	30. Acquire fishing permit	1	0	0	0
	31. Acquire hunting permit	1	1	0	0
	Total score (31 services)	30	25	13.04	0
	Percentage (31 services)	96.77419	80.65	42.06	0.00
	Weighted score (31 services)	7.5	12.5	9.78	0
	Total weighted score (31 services)	29.78			

Source: Author's compilation.



Table A4					
Prince Edward Island					
	Service	Stage 1	Stage 2	Stage 3	Stage 4
Small sample: original 10 services examined by the Stratford Institute for Digital Media	1. Acquire child care subsidy	1	1	0	0
	2. Reserve provincial park campground	1	1	1	0
	3. Apply for provincial student loan	1	1	1	0
	4. Apply for provincial government job	1	1	1	0
	5. Change address on driver's licence	1	0	0	0
	6. Pay transportation fine	1	1	0	0
	7. Apply for personal certificates	1	1	1	0
	8. Acquire business registration	1	1	0	0
	9. Apply for operation permit	1	1	0.03	0
	10. Dissolve business registration	1	1	0	0
	Total score (10 services)	10	9	4.03	0
	Percentage (10 services)	100	90	40.03	0
	Weighted score (10 services)	2.5	4.5	3.0225	0
	Total weighted score (10 services)	10.02			
Large sample Newly added services	11. Apply for vehicle permit renewal	1	1	1	0
	12. Make driver's test payment	1	1	0	0
	13. Acquire vehicle registration	1	1	0	0
	14. Acquire driver's abstract	1	1	0	0
	15. Apply for health card	1	1	0	0
	16. Acquire health card renewal/replacement	1	1	0	0
	17. Apply for health services reimbursement	0	0	0	0
	18. Obtain transcript, diploma	1	1	0	0
	19. Apply for scholarship	1	1	0	0
	20. Apply for school (public college)	1	1	1	0
	21. Access land registry	1	1	1	0
	22. Execute lien check	1	1	1	0
	23. Apply for teacher certification	1	1	0	0
	24. Submit fuel tax	1	1	0	0
	25. Submit tobacco tax	1	1	0	0
	26. Participate in procurement	1	1	0	0
	27. Submit provincial immigration program application	1	1	0	0
	28. Register to vote	1	1	0	0
	29. Obtain workers' compensation board letter	1	1	1	0
	30. Acquire fishing permit	1	0	1	0
	31. Acquire hunting permit	1	1	1	0
	Total score (31 services)	30	27	11.03	0
	Percentage (31 services)	96.77419	87.10	35.58	0.00
	Weighted score (31 services)	7.5	13.5	8.2725	0
	Total weighted score (31 services)	29.27			

Source: Author's compilation.

Appendix B

Assessment of Access to E-Services - Data Sheets

Assessment of Access to E-Services

Table B1				
Nova Scotia				
	Service	Accessed through One-Stop Shop Portal	Ease of site Navigation/Use	Mobile Web
Small sample: original 10 services examined by the Stratford Institute for Digital Media	1. Acquire child care subsidy	Yes (search engine)	Moderate	No
	2. Reserve provincial park campground	Yes (visitor tab)	Easy	No
	3. Apply for provincial student loan	Yes (search engine)	Moderate	Yes (interrupted)
	4. Apply for provincial government job	Yes (resident tab)	Easy	Yes
	5. Change address on driver's licence	Yes (online services tab)	Easy	Yes (interrupted)
	6. Pay transportation fine	Yes (online services tab)	Easy	Yes (interrupted)
	7. Apply for personal certificates	Yes (online services tab)	Easy	Yes (interrupted)
	8. Acquire business registration	Yes (online services tab)	Easy	Yes (interrupted)
	9. Apply for operation permit	Yes (online services tab)	Easy	Yes (interrupted)
	10. Dissolve business registration	Yes (browsing)	Moderate	No
Newly added services	11. Apply for vehicle permit renewal	Yes (online services tab)	Easy	Yes (interrupted)
	12. Make driver's test payment	Yes (online services tab)	Easy	Yes (interrupted)
	13. Acquire vehicle registration	Yes (search engine)	Easy	No
	14. Acquire driver's abstract	Yes (search engine)	Easy	No
	15. Apply for health card	Yes (search engine)	Difficult	No
	16. Acquire health card renewal/replacement	Yes (search engine)	Easy	No
	17. Apply for health services reimbursement	Yes (search engine)	Easy	No
	18. Obtain transcript, diploma	Yes (search engine)	Easy	No
	19. Apply for scholarship	Yes (search engine)	Easy	No
	20. Apply for school (public college)	Yes (search engine)	Easy	No
	21. Access land registry	Yes (resident tab)	Easy	No
	22. Execute lien check	Yes (online services tab)	Easy	No
	23. Apply for teacher certification	Yes (online services tab)	Easy	No
	24. Submit fuel tax	Yes (search engine)	Easy	No
	25. Submit tobacco tax	Yes (search engine)	Easy	No
	26. Participate in procurement	Yes (online services tab)	Easy	No
	27. Submit provincial immigration program application	Yes (resident tab)	Easy	Yes
	28. Register to vote	Yes (I want to... tab)	Easy	No
	29. Obtain workers' compensation board letter	Yes (online services tab)	Easy	Yes
	30. Acquire fishing permit	No (Google search)	Difficult	No
	31. Acquire hunting permit	Yes (search engine)	Easy	No

Source: Author's compilation.

Table B2				
New Brunswick				
Small sample: original 10 services examined by the Stratford Institute for Digital Media	Service	Accessed through One-Stop Shop Portal	Ease of site Navigation/Use	Mobile Web
	1. Acquire child care subsidy	Yes (search engine)	Easy	No
	2. Reserve provincial park campground	Yes (visiting tab)	Easy	Yes
	3. Apply for provincial student loan	Yes (search engine)	Easy	No
	4. Apply for provincial government job	Yes (employment tab)	Easy	No
	5. Change address on driver's licence	Yes (search engine)	Moderate	No
	6. Pay transportation fine	No (Service New Brunswick)	Moderate	No
	7. Apply for personal certificates	No (Service New Brunswick)	Moderate	No
	8. Acquire business registration	Yes (business tab)	Easy	No
	9. Apply for operation permit	Yes (services/Bizpal)	Moderate	Yes (Bizpal only)
	10. Dissolve business registration	Yes (search engine)	Moderate	No
Newly added services	11. Apply for vehicle permit renewal	Yes (resident tab)	Easy	Yes (interrupted)
	12. Make driver's test payment	Yes (resident tab)	Moderate	No
	13. Acquire vehicle registration	Yes (resident tab)	Easy	No
	14. Acquire driver's abstract	Yes (search engine)	Easy	No
	15. Apply for health card	Yes (resident tab)	Easy	No
	16. Acquire health card renewal/replacement	Yes (resident tab)	Easy	No
	17. Apply for health services reimbursement	Yes (resident tab)	Easy	No
	18. Obtain transcript, diploma	Yes (resident tab)	Easy	No
	19. Apply for scholarship	Yes (search engine)	Easy	No
	20. Apply for school (public college)	Yes (resident tab)	Easy	Yes (interrupted)
	21. Access land registry	Yes (resident tab)	easy	No
	22. Execute lien check	Yes (resident tab)	Easy	No
	23. Apply for teacher certification	Yes (resident tab)	Easy	No
	24. Submit fuel tax	Yes (services tab)	Easy	No
	25. Submit tobacco tax	Yes (services tab)	Easy	No
	26. Participate in procurement	Yes (business tab)	Easy	No
	27. Submit provincial immigration program application	Yes (visitor tab)	Easy	No
	28. Register to vote	Yes (search engine)	Easy	No
	29. Obtain workers' compensation board letter	Yes (business tab)	Easy	No
	30. Acquire fishing permit	Yes (search engine)	Easy	No
	31. Acquire hunting permit	Yes (search engine)	Easy	No

Source: Author's compilation.

Table B3				
Newfoundland and Labrador				
	Service	Accessed through One-Stop Shop Portal	Ease of site Navigation/Use	Mobile Web
Small sample: original 10 services examined by the Stratford Institute for Digital Media	1. Acquire child care subsidy	Yes (resident tab)	Easy	No
	2. Reserve provincial park campground	Yes (resident tab)	Easy	Yes (interrupted)
	3. Apply for provincial student loan	Yes (quick links)	Easy	No
	4. Apply for provincial government job	Yes (quick links)	Easy	No
	5. Change address on driver's licence	Yes (resident tab)	Difficult	No
	6. Pay transportation fine	Yes (search engine)	Easy	No
	7. Apply for personal certificates	Yes (resident tab)	Easy	No
	8. Acquire business registration	Yes (quick links)	Easy	No
	9. Apply for operation permit	Yes (business tab)	Easy	Yes (Bizpal only)
	10. Dissolve business registration	Yes (quick links)	Moderate	No
Newly added services	11. Apply for vehicle permit renewal	Yes (home page)	Easy	No
	12. Make driver's test payment	Yes (resident tab)	Easy	No
	13. Acquire vehicle registration	Yes (resident tab)	Easy	No
	14. Acquire driver's abstract	Yes (search engine)	Easy	No
	15. Apply for health card	Yes (home page)	Easy	No
	16. Acquire health card renewal/replacement	Yes (home page)	Easy	No
	17. Apply for health services reimbursement	Yes (search engine)	Moderate	No
	18. Obtain transcript, diploma	Yes (resident tab)	Moderate	No
	19. Apply for scholarship	Yes (resident tab)	Moderate	No
	20. Apply for school (public college)	Yes (resident tab)	Moderate	Yes (interrupted)
	21. Access land registry	Yes (resident tab)	Easy	No
	22. Execute lien check	Yes (resident tab)	Easy	No
	23. Apply for teacher certification	Yes (resident tab)	Easy	No
	24. Submit fuel tax	Yes (search engine)	Moderate	No
	25. Submit tobacco tax	Yes (search engine)	Moderate	No
	26. Participate in procurement	Yes (business tab)	Easy	No
	27. Submit provincial immigration program application	Yes (search engine)	Easy	No
	28. Register to vote	No (service not available)	N/A	N/A
	29. Obtain workers' compensation board letter	Yes (search engine)	Easy	No
	30. Acquire fishing permit	Yes (search engine)	Easy	No
	31. Acquire hunting permit	Yes (search engine)	Easy	No

Source: Author's compilation.

Table B4				
Prince Edward Island				
	Service	Accessed through One-Stop Shop Portal	Ease of site Navigation/Use	Mobile Web
Small sample: original 10 services examined by the Stratford Institute for Digital Media	1. Acquire child care subsidy	Yes (resident tab)	Easy	No
	2. Reserve provincial park campground	Yes (a-z services tab)	Moderate	Yes (interrupted)
	3. Apply for provincial student loan	Yes (resident tab)	Easy	No
	4. Apply for provincial government job	Yes (online services tab)	Easy	No
	5. Change address on driver's licence	No (Google)	Difficult	No
	6. Pay transportation fine	Yes (A-Z services tab)	Moderate	No
	7. Apply for personal certificates	Yes (online services tab)	Easy	No
	8. Acquire business registration	Yes (business tab)	Easy	No
	9. Apply for operation permit	Yes (business tab)	Easy	Yes (Bizpal only)
	10. Dissolve business registration	Yes (business tab)	Moderate	No
Newly added services	11. Apply for vehicle permit renewal	Yes (resident tab)	Easy	No
	12. Make driver's test payment	Yes (resident tab)	Easy	No
	13. Acquire vehicle registration	Yes (resident tab)	Easy	No
	14. Acquire driver's abstract	Yes (resident tab)	Easy	No
	15. Apply for health card	Yes (resident tab)	Moderate	No
	16. Acquire health card renewal/replacement	Yes (resident tab)	Easy	No
	17. Apply for health services reimbursement	No (service not available)	N/A	N/A
	18. Obtain transcript, diploma	Yes (search engine)	Moderate	No
	19. Apply for scholarship	Yes (search engine)	Easy	No
	20. Apply for school (public college)	Yes (resident tab)	Easy	Yes
	21. Access land registry	Yes (A-Z services tab)	Easy	No
	22. Execute lien check	Yes (online services tab)	Easy	No
	23. Apply for teacher certification	Yes (A-Z services tab)	Easy	No
	24. Submit fuel tax	Yes (business tab)	Easy	No
	25. Submit tobacco tax	Yes (business tab)	Easy	No
	26. Participate in procurement	Yes (business tab)	Easy	No
	27. Submit provincial immigration program application	Yes (home page - quick links)	Easy	No
	28. Register to vote	Yes (government tab)	Moderate	No
	29. Obtain workers' compensation board letter	Yes (business tab)	Easy	No
	30. Acquire fishing permit	Yes (search engine)	Easy	No
	31. Acquire hunting permit	Yes (search engine)	Easy	No

Source: Author's compilation.

Appendix C

Internet Links to Examined Services

Nova Scotia

1. Acquire child care subsidy	http://www.ednet.ns.ca/earlyyears/families/childcaresubsidy.shtml
2. Reserve provincial park campground	http://parks.gov.ns.ca/misc/make_a_reservation.asp
3. Apply for provincial student loan	http://novascotia.ca/studentassistance/Apply/
4. Apply for provincial government job	https://www.careerbeacon.com/corpprof/govns/govns.html
5. Change address on driver's licence	https://isd.acol.ca/isd/rmv/ChangeAddress/Start.do?lang=en
6. Pay transportation fine	http://novascotia.ca/sns/access/services/fine-payments.asp
7. Apply for personal certificates	https://isd.acol.ca/isd/vs/?lang=en
8. Acquire business registration	http://novascotia.ca/sns/access/business/online-service.asp
9. Apply for operation permit	http://novascotia.ca/sns/paal/
10. Dissolve business registration	http://novascotia.ca/sns/access/business/ending-a-business.asp
11. Apply for vehicle permit renewal	https://isd.acol.ca/isd/rmv/VehiclePlateRenewal/Start.do?lang=en
12. Make driver's test payment	http://novascotia.ca/sns/access/online-services/road-test-payments.asp?bhcp=1 , https://isd.acol.ca/isd/rmv/KnowledgeTest/Start.do?lang=en
13. Acquire vehicle registration	http://novascotia.ca/sns/paal/rmv/paal271.asp
14. Acquire driver's abstract	https://www.novascotia.ca/sns/rmv/licence/abstracts.asp
15. Apply for health card	http://novascotia.ca/DHW/msi/faq.asp
16. Acquire health card renewal/replacement	http://novascotia.ca/DHW/msi/health_cards.asp
17. Apply for health services reimbursement	http://novascotia.ca/dhw/pharmacare/pharmacare-reimbursement-forms.asp
18. Obtain transcript, diploma	http://www.ednet.ns.ca/transcripts.shtml#highschool
19. Apply for scholarship	http://www.novascotia.ca/studentassistance/financing/scholarships.asp
20. Apply for school (public college)	http://www.nsc.ca/admissions/applying/index.asp
21. Access land registry	http://www.snb.ca/e/1000/1008e.asp#5
22. Execute lien check	https://pprs.acol.ca/lc/?lang=en
23. Apply for teacher certification	https://edapps.ednet.ns.ca/teachercert/PayIntro.aspx
24. Submit fuel tax	http://www.novascotia.ca/sns/access/business/tax-commission/fuel-tax.asp
25. Submit tobacco tax	http://www.novascotia.ca/sns/access/business/tax-commission/tobacco-tax.asp
26. Participate in procurement	http://novascotia.ca/sns/access/business/online-service.asp
27. Submit provincial immigration program application	http://novascotiainmigration.com/
28. Register to vote	http://electionsnovascotia.ca/voters/get-on-the-list
29. Obtain workers' compensation board letter	https://accesstobusiness.snsnr.gov.ns.ca/a2b_web/portal/wcbInformation.jsf
30. Acquire fishing permit	https://www.novascotia.ca/sns/paal/fish/paal190.asp
31. Acquire hunting permit	http://novascotia.ca/natr/hunt/retailvendors.asp

New Brunswick

1. Acquire child care subsidy	http://www2.gnb.ca/content/gnb/en/services/services_renderer.14136.Day_Care_Assistance_Program.html#serviceDescription
2. Reserve provincial park campground	http://www.tourismnewbrunswick.ca/Help/PageNotFound.aspx?item=%2fhome%2ffaccommodations&user=extranet\Anonymous&site=tourismnewbrunswick_rs
3. Apply for provincial student loan	http://www2.gnb.ca/content/gnb/en/departments/post-secondary_education_training_and_labour/Skills/content/FinancialSupport/StudentFinancialServices.html
4. Apply for provincial government job	http://www2.gnb.ca/content/gnb/en/gateways/employment.html
5. Change address on driver's licence	http://www.snb.ca/e/6000/6901e.asp#3

6. Pay transportation fine	https://www.pxw1.snb.ca/snb9000/product.aspx?productid=A001P780875&l=e
7. Apply for personal certificates	https://www.pxw1.snb.ca/snb7001/e/2000/2001e.asp
8. Acquire business registration	https://www.pxw1.snb.ca/snb7001/e/2000/2500e_1.asp
9. Apply for operation permit	http://www2.gnb.ca/content/gnb/en/services/business.html
10. Dissolve business registration	https://www.pxw1.snb.ca/snb7001/e/2000/2500e_3.asp
11. Apply for vehicle permit renewal	https://www.pxw1.snb.ca/snb9000/product.aspx?ProductID=A001P780000&l=e
12. Make driver's test payment	http://www.snb.ca/e/1000/1005e.asp#
13. Acquire vehicle registration	http://www2.gnb.ca/content/gnb/en/services/services_renderer.200814.html
14. Acquire driver's abstract	http://www2.gnb.ca/content/gnb/en/services/services_renderer.200564.Driver_Records.html
15. Apply for health card	http://www2.gnb.ca/content/gnb/en/departments/health/MedicarePrescriptionDrugPlan/content/medicare/ApplyingforaCard.html
16. Acquire health card renewal/replacement	http://www2.gnb.ca/content/gnb/en/departments/health/MedicarePrescriptionDrugPlan/content/medicare/ApplyingforaCard.html
17. Apply for health services reimbursement	http://www2.gnb.ca/content/gnb/en/departments/health/MedicarePrescriptionDrugPlan.html
18. Obtain transcript, diploma	http://www2.gnb.ca/content/gnb/en/departments/education/k12/content/transcripts_diplomas.html
19. Apply for scholarship	http://www2.gnb.ca/content/gnb/en/departments/education/k12/content/scholarships.html
20. Apply for school (public college)	https://www.pxw1.snb.ca/SNB9000/product.aspx?productid=A001P610000A
21. Access land registry	http://www.snb.ca/e/1000/1008e.asp#5
22. Execute lien check	https://pprs.acol.ca/lc/index.do?lang=en
23. Apply for teacher certification	http://www2.gnb.ca/content/gnb/en/services/services_renderer.599.html#serviceDescription
24. Submit fuel tax	http://www2.gnb.ca/content/gnb/en/services/services_renderer.8435.Taxes_-_Gasoline_and_Motive_Fuel_Tax.html
25. Submit tobacco tax	http://www2.gnb.ca/content/gnb/en/services/services_renderer.13536.Taxes_-_Tobacco_Tax.html
26. Participate in procurement	https://nbon-rpanb.gnb.ca/welcome?language=En
27. Submit provincial immigration program application	http://www.welcomenb.ca/content/wel-bien/en/immigrating_and_settling/how_to_immigrate/new_brunswick_provincialnomineeeprogram.html
28. Register to vote	http://www.electionsnb.ca/content/enb/en/voters/voters-list.html
29. Obtain workers' compensation board letter	http://www.worksafenb.ca/
30. Acquire fishing permit	http://www2.gnb.ca/content/gnb/en/departments/natural_resources/e-Licensing.html
31. Acquire hunting permit	http://www2.gnb.ca/content/gnb/en/departments/natural_resources/e-Licensing.html

Newfoundland and Labrador

1. Acquire child care subsidy	http://www.ed.gov.nl.ca/edu/family/childcare/childcaresubsidy.html
2. Reserve provincial park campground	https://www.nlcamping.ca/Home.aspx
3. Apply for provincial student loan	http://www.aes.gov.nl.ca/studentaid/apply/fulltime_201516.html
4. Apply for provincial government job	https://www.hiring.gov.nl.ca/Default.aspx
5. Change address on driver's licence	https://www.eservices.gov.nl.ca/HostPub/MRDWeb/default.jsp
6. Pay transportation fine	http://www.justice.gov.nl.ca/just/departement/branches/division/fines_admin.html
7. Apply for personal certificates	http://www.servicenl.gov.nl.ca/vitalstats/index.html
8. Acquire business registration	http://www.servicenl.gov.nl.ca/registries/companies.html
9. Apply for operation permit	http://www.servicenl.gov.nl.ca/licenses/index.html and Bizpal
10. Dissolve business registration	http://www.servicenl.gov.nl.ca/registries/companies/corp_ard.html
11. Apply for vehicle permit renewal	https://www.eservices.gov.nl.ca/HostPub/MRDWeb/default.jsp
12. Make driver's test payment	https://onlinepayments.gov.nl.ca/RoadTest/
13. Acquire vehicle registration	http://www.servicenl.gov.nl.ca/drivers/DriversandVehicles/vehicleregistration/registration.html
14. Acquire driver's abstract	http://www.servicenl.gov.nl.ca/drivers/DriversandVehicles/driverlicensing/abstract.html
15. Apply for health card	http://www.health.gov.nl.ca/health/forms/index.html#3

16. Acquire health card renewal/replacement	http://www.health.gov.nl.ca/health/forms/index.html#3
17. Apply for health services reimbursement	http://www.health.gov.nl.ca/health/prescription/how_are_claims_reimbursed.html#2
18. Obtain transcript, diploma	http://www.ed.gov.nl.ca/edu/k12/highschool/transcripts.html http://www.aes.gov.nl.ca/postsecondary/transcripts.html#open
19. Apply for scholarship	http://www.aes.gov.nl.ca/postsecondary/scholarships.html#curtis
20. Apply for school (public college)	https://www.cna.nl.ca/application/default.aspx
21. Access land registry	http://www.miga.gov.nl.ca/lands/titles.html
22. Execute lien check	http://www.servicenl.gov.nl.ca/registries/property/prop_lien_check.html
23. Apply for teacher certification	http://www.ed.gov.nl.ca/edu/forms/teachers/index.html
24. Submit fuel tax	http://www.fin.gov.nl.ca/fin/tax_programs_incentives/business/taxefile.html
25. Submit tobacco tax	http://www.fin.gov.nl.ca/fin/tax_programs_incentives/business/taxefile.html
26. Participate in procurement	http://www.gpa.gov.nl.ca/tenders/index.html
27. Submit provincial immigration program application	http://www.nlpnp.ca/index.html
28. Register to vote	N/A
29. Obtain workers' compensation board letter	http://www.gov.nl.ca/whscrd/index.html
30. Acquire fishing permit	http://www.env.gov.nl.ca/env/wildlife/season_dates/fishing.html
31. Acquire hunting permit	http://www.env.gov.nl.ca/env/wildlife/hunting/licenses.html#small

Prince Edward Island

1. Acquire child care subsidy	http://www.gov.pe.ca/sss/index.php3?number=20682&lang=E
2. Reserve provincial park campground	https://www.tourismpei.com/camping
3. Apply for provincial student loan	http://www.studentloan.pe.ca/
4. Apply for provincial government job	http://www.gov.pe.ca/jobs/
5. Change address on driver's licence	http://www.gov.pe.ca/photos/original/tpw_dh_chap1.pdf
6. Pay transportation fine	http://www.courts.pe.ca/index.php?number=1051101
7. Apply for personal certificates	http://www.gov.pe.ca/vitalstatistics/index.php3?number=1051636&lang=E
8. Acquire business registration	http://www.gov.pe.ca/jps/index.php3?number=1028845&lang=E
9. Apply for operation permit	http://www.innovationpei.com/BizPal#BusinessPortal
10. Dissolve business registration	http://www.gov.pe.ca/jps/index.php3?number=1027252#BusinessPortal
11. Apply for vehicle permit renewal	http://www.gov.pe.ca/highwaysafety/index.php3?number=1047913&lang=E
12. Make driver's test payment	http://www.gov.pe.ca/highwaysafety/index.php3?number=20061&lang=E
13. Acquire vehicle registration	http://www.gov.pe.ca/highwaysafety/index.php3?number=49747&lang=E
14. Acquire driver's abstract	http://www.gov.pe.ca/forms/pdf/1794.pdf
15. Apply for health card	http://www.healthpei.ca/healthcard
16. Acquire health card renewal/replacement	http://www.healthpei.ca/healthcard
17. Apply for health services reimbursement	N/A
18. Obtain transcript, diploma	http://www.gov.pe.ca/eecd/index.php3?number=1037774&lang=E
19. Apply for scholarship	http://www.studentloan.pe.ca/index.php3?number=1040566
20. Apply for school (public college)	http://www.hollandc.pe.ca/admissions/
21. Access land registry	http://www.taxandland.pe.ca/index.php3?number=1011355
22. Execute lien check	https://pprs.acol.ca/lc/index.do
23. Apply for teacher certification	http://www.gov.pe.ca/eecd/index.php3?number=1027691
24. Submit fuel tax	http://www.taxandland.pe.ca/index.php3?number=1036944&lang=E
25. Submit tobacco tax	http://www.taxandland.pe.ca/index.php3?number=78504&lang=E
26. Participate in procurement	http://www.gov.pe.ca/finance/index.php3?number=1041973&lang=E
27. Submit provincial immigration program application	http://www.gov.pe.ca/immigration/

28. Register to vote	http://www.electionspei.ca/index.php?number=1046868&lang=E
29. Obtain workers' compensation board letter	http://www.wcb.pe.ca/Employers/Eservices
30. Acquire fishing permit	http://www.gov.pe.ca/infopei/index.php3?number=1036356&lang=E
31. Acquire hunting permit	http://www.gov.pe.ca/infopei/index.php3?number=1036356&lang=E

Source: Author's compilation.

Appendix D

Top 20 E-Government Countries, 2014

Rank	Country	Stage 1	Stage 2	Stage 3	Stage 4
(percentage of services)					
1	South Korea	100	82	77	88
2	Australia	100	75	88	65
3	Singapore	100	89	88	71
4	France	100	73	91	91
5	Netherlands	100	75	70	88
6	Japan	97	73	79	88
7	United States	100	68	77	94
8	United Kingdom	100	73	63	88
9	New Zealand	97	66	84	53
10	Finland	100	70	47	65
11	Canada	100	73	84	68
12	Spain	100	93	70	71
13	Norway	97	77	44	56
14	Sweden	91	70	44	50
15	Estonia	100	66	56	59
16	Denmark	97	70	33	44
17	Israel	91	64	42	53
18	Bahrain	94	80	84	74
19	Iceland	84	57	49	35
20	Austria	100	75	88	65

Source: United Nations (2014).

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