NACIONALNA ALIJANSA ZA LOKALNI EKONOMSKI RAZVOJ

NALED

NATIONAL ALLIANCE FOR LOCAL ECONOMIC DEVELOPMENT

A Framework for e-Government for the Republic of Serbia

JUNE 3, 2016

IBM

IBM Corporate Service Corps Serbia2 – NALED Team

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1 EXECUTIVE SUMMARY

Serbia is well poised to take the next steps on its e-Government journey. Several successful implementations have been completed over the years. With the adoption of the "Serbian Electronic Government Development Strategy 2015 – 2018" the Government has indicated its intention and willingness to make progress in this area. In this paper, a Framework for e-Government is laid out to assist in the implementation of this strategy.

Through many discussions with stakeholders from the government, business sector, and the international community, we have gathered information and data about the current state of e-Government in Serbia. We then researched several global reports for rankings and best practices. From our analysis we have come up with several recommendations to include as part of the Framework for e-Government. One of these recommendations includes setting up a central body that will drive and coordinate all e-Government related activities while ensuring representation from all appropriate stakeholders. Other recommendations include establishing common data definitions and authoritative data sources, implementing open data standards, and ensuring legal alignment with any new e-Government laws. An action plan is provided to assist in planning the implementation.

To provide assistance in the implementation and coordination process, we have outlined a methodology that can be used to objectively determine the order of priority. A communications plan is outlined to guide the process of ensuring awareness, acceptance and participation. Finally, some next steps are identified that NALED, with the assistance of others, can take to further prepare for and help in the implementation of the Framework for e-Government for Serbia.

2 INTRODUCTION

2.1 IBM CORPORATE SERVICE CORPS

The Corporate Service Corps (CSC) is an IBM leadership development and social give-back initiative. It is designed to expose high performing IBM employees to doing business in emerging markets, diverse cultures, global teams, and complex policy environments. The CSC Program is integrated with IBM's global business strategy and is intended to help enhance global economic and social development and build the leadership skills of IBM employees as global citizens. The CSC program focuses on several priorities including but not limited to:

- Economic Development and Innovation
- Raising Global Standards in Education
- Broadening Cultural Awareness
- Promoting Openness and Transparency

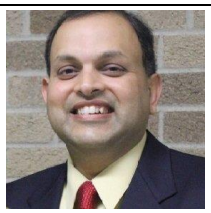
The CSC program brings together teams of IBM Leaders with a diverse set of skills from around the world and different business units. These teams are placed in growth markets to tackle important social and economic issues in collaboration with Non-Government Organization (NGO) partners from around the world. These IBMers are assigned to work on projects of significant value in different countries with four weeks of the project taking place in country. These teams are expected to tackle real societal, educational and economic challenges, while at the same time experiencing a diverse cultural perspective and enhancing their skills and leadership competencies.

Since 2008, IBM's CSC program has sent IBM's top talent all around the world to provide pro bono problem solving services to non-governmental organizations, governments and small business groups in the developing countries on the issues that intersect business, technology and society.

The second CSC team in Serbia was deployed during the period May – June 2016. During the one month IBM's Corporate Service Corps pro bono consulting program, twelve IBM employees from five different countries (USA, India, Philippines, Argentina and Singapore) worked with three non-governmental organizations in Belgrade to help attract foreign investment, foster IT community development, develop strategy and improve business environment. Our sub-team is working with NALED in the development of a framework for e-Government in Serbia. Team Serbia2 is based in Belgrade for the duration of in-country assignment.

By the end of 2016, IBM CSC program will have dispatched approximately 3000 IBM employees originating from over 60 countries on engagements to 38 countries -- making this pro bono problem solving program one of the world's largest programs.

2.2 IBM CSC SERBIA2: NALED TEAM

	**Edmundo Fortajada** Continuous Process Improvement Project Manager, Global Process Services, IBM Philippines	• Lean Six Sigma • Business Process Improvement • Project Management • People Management • Business Transformation
	**Mahesh Ganesan** Project Executive, Smarter Workforce / Kenexa Business Unit, Analytics, IBM USA	• Strategy & Transformation Consulting • Large Projects Leadership • HR and talent management • Managing large cross-functional teams • Senior leadership communications
	**Andrew Meyer** Delivery Project Executive, Global Technology Services, IBM USA	• Project Management • People Management • Mentoring and Coaching • Lean/Six Sigma methodologies • Service Management • Data Center/IT Infrastructure Management
	**Aneeta Razdan** Global Value Driven Proposal Program Leader, Transformation & Operations, IBM India	• Document management for proposal experts • Value driven Proposal Management • Proposal delivery execution • Proposal Skill Enablement • People management • Program management

2.3 CURRENT STATE OF E-GOVERNMENT IN SERBIA

The current time holds promise for much positive momentum in Serbia. Elections have recently concluded and a new government is being formed. Serbia continues to make progress on its stated goal of completing ascension to EU within a few years. According to the European Commission[i], Serbia has made significant progress in the area of electronic government (e-Government).[1] Over the past decade, several key laws governing e-Government have been adopted and a number of special laws that helped introduce information technology in the work of state authorities, enabling citizens and businesses to access various services online at both the national and local levels. A special working group responsible for the establishment of a legal framework for the development of e-Government has been formed. There have been several recent successes in the area of e-Government. For example:

[1] e-Government is the use of a range of information technologies by government agencies to transform government operations in order to improve effectiveness, efficiency, service delivery and to promote democracy. It is the use of information technology to support government operations, provide investments that are needed in people, tools, policies, processes, engage citizens and provide government services.

- E-permitting for construction permitting
- Single point contact for birth registration (early stages)
- Simplified kindergarten enrollment (early stages)
- Customs transit records system

In addition, a new law on Public Administrative Procedures was adopted as of March 9th, 2016 that promises to make citizens' services much smoother as data currently residing within a government office is not supposed to be requested for a second time by another government office. This is also an opportune time for the discussion of an e-Government framework since an e-Government and e-Commerce law are both in draft form right now. As of March 16th 2016, on portal *http://www.euprava.gov.rs/eusluge/usluge_po_slovu* there were 635 different e-services available in total, out of which 441 services for citizens, 181 for businesses, 13 for state authorities.

According to EU Government Action Plan 2016-2020[ii]: economic and budgetary pressures force governments to be ever more efficient, effective and to find new sources of growth and employment. Against the background of positive changes, we found opportunities for continuing to make rapid progress on e-Governmental initiatives. For example:

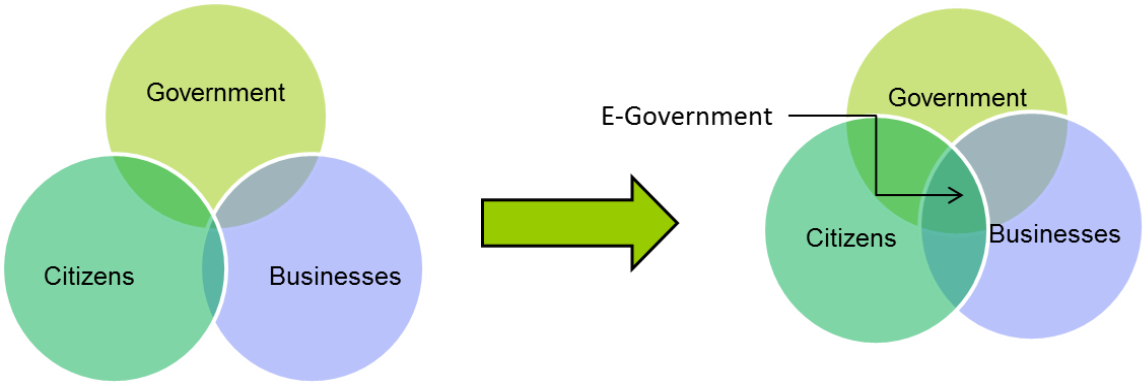
- The absence of a central body to lead and manage e-Governmental initiatives looking across all government agencies and the need to have better coordinated approach to e-Governmental policies across the board
- Differences in the deployment of electronic services and usage of Information and Communications Technology (ICT) from one institution to another. Some institutions already offer a high transaction level of e-Government services, whilst others are just starting establishing electronic services.
- Businesses' and citizens' need for greater transparency and participation in policy and decision making.
- The lack of accepted electronic identities (eIDs), the need to provide the same data more than once and poor quality and user unfriendly online public services.

In addition, in comparing Serbia to several countries in the neighboring region, a lower ranking is found for Serbia as identified by multiple studies (Ex: World Bank, UNDP, EU etc.).

It is the will of the Serbian people to be like other EU nations, to gain the economic standards & lifestyles of their neighboring countries. Businesses continue to look to Serbia but also indicate the need for structural reforms covering areas of e-Government. E-Government is not the end in itself but a means to address some of the common issues like need for transparency, better citizen & customer service, economic growth and attracting new businesses to Serbia. The recently published "Serbian Electronic Government Development Strategy 2015-2018 and the action plan for the implementation of the strategy 2015-2016" calls out the reforms needed. It is now time to take the reforms to the next level.

In further sections, we provide more details on Serbia's relative ranking as noted by several studies, identify issues called out by multiple stakeholder interviews and provide recommendations for further enhancing e-Government to improve the attractiveness of Serbia as a business investment location.

It is our hope that through the implementation of various reforms, and increased collaboration between the government, businesses and citizens, e-Government can be the central part of the strategy for an e-Serbia.



e-Government requires increased collaboration

2.4 What is e-Government and e-Commerce?

According to the World Bank[iii], **e-Government** refers to the use of information and communications technologies (ICT) to improve the efficiency, effectiveness, transparency and accountability of government.

E-Government can be seen simply as moving citizen services online, but in its broadest sense it refers to the technology-enabled transformation of government - governments' best hope to reduce costs, whilst promoting economic development, increasing transparency in government, improving service delivery and public administration, and facilitating the advancement of an information society.

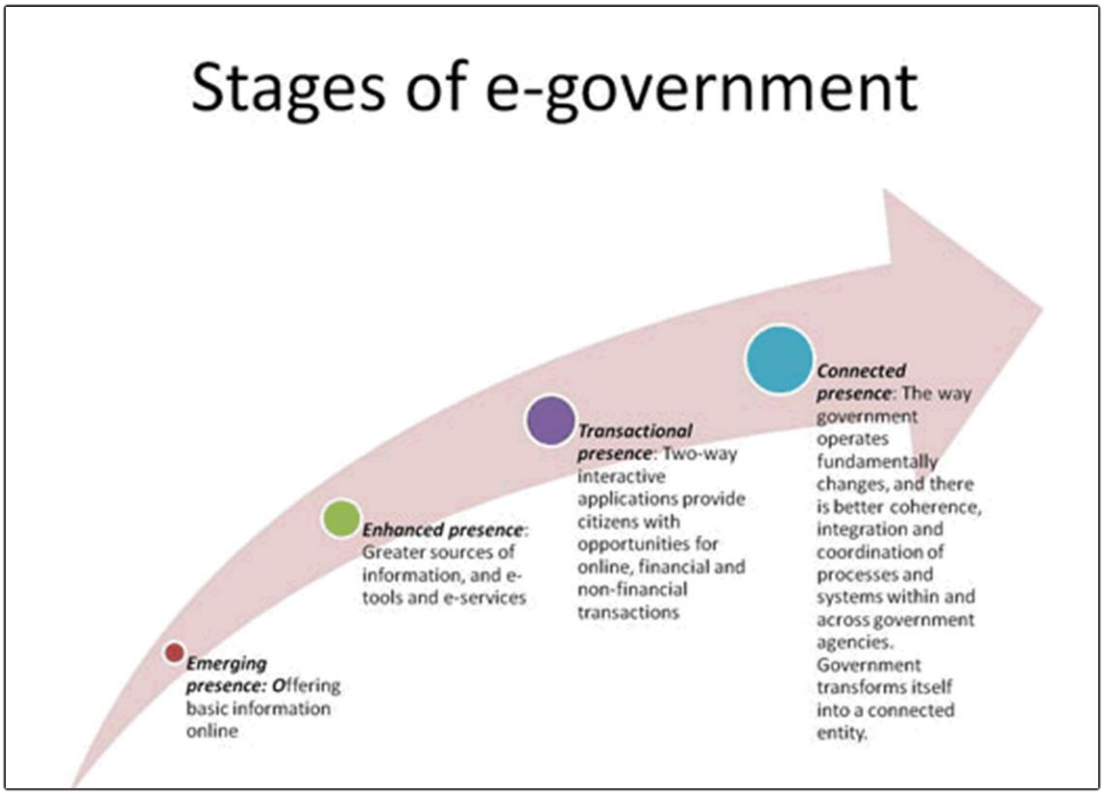
E-Government is not limited to the richer countries; some of the most innovative e-Government applications are now happening in the developing world. E-Government is about transforming government to be more citizen- centered. Technology is a tool in this effort.[iv]

E-Government usually describes relationships across 3 modalities:

Government to Citizen: deals with the relationship between government and citizens. G2C allows citizens to access government information and services instantly, conveniently, from everywhere, by use of multiple channels.

Government to Business: consists of e-interactions between government and the private sector. The opportunity to conduct online transactions with government reduces red tape and simplifies regulatory processes, therefore helping businesses to become more competitive.

Government to Government: Governments depend on other levels of government within the state to effectively deliver services and allocate responsibilities. In promoting citizen-centric service, a single access point to government is the ultimate goal, for which cooperation among different governmental departments and agencies is necessary. G2G facilitates the sharing of databases, resources and capabilities, enhancing the efficiency and effectiveness of processes.



These stages can be used by Serbia to track its own progress as it continues its e-Government journey.

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, programs, 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, licenses 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 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.

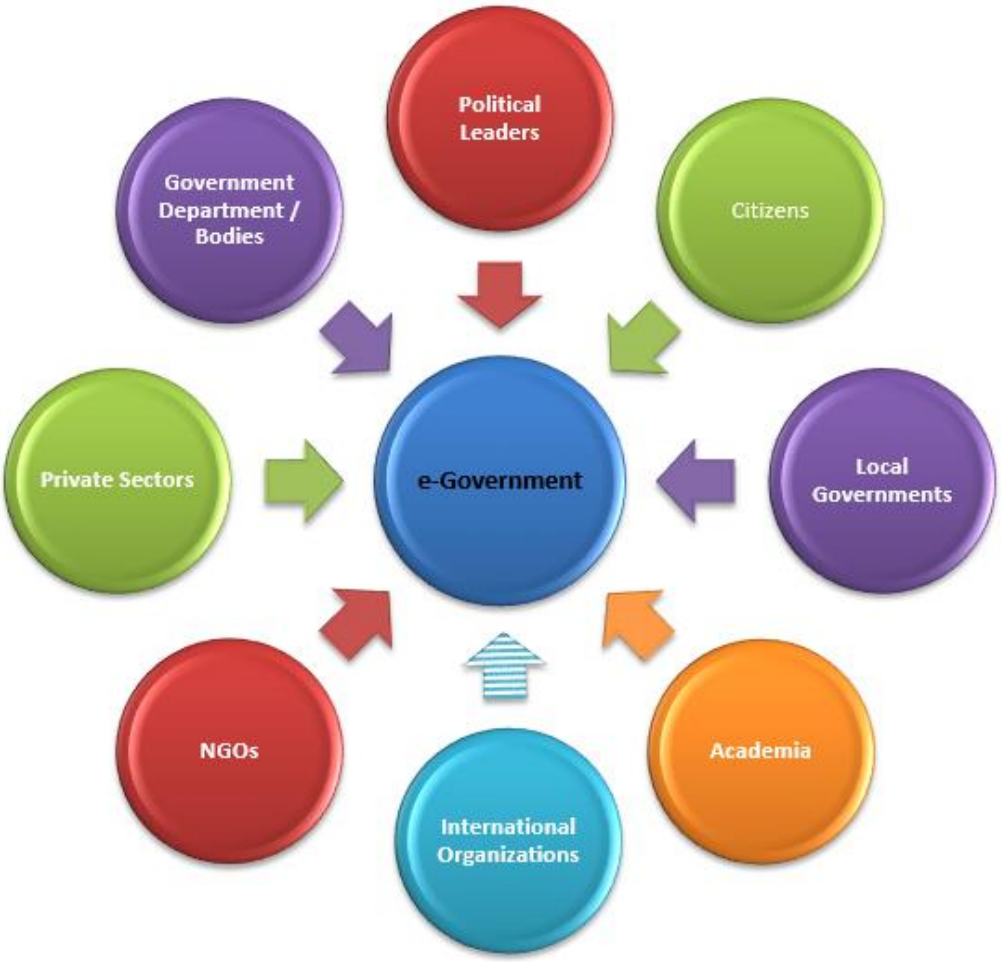
Finally, the government is a "platform", not a "vending machine". As aptly described, citizens tend to think of government as a kind of vending machine. They put in taxes and get out services that governments provide. However, this vending machine idea is giving way to the idea of "government as a platform". The platform metaphor means that government provides a system in place to deliver services not by governments alone, but also by citizens and others (which also allows people inside and outside to innovate). In doing so, governments embrace collaboration with partners such as NGOs to enhance value for citizens and increase uptake; orchestrating these partnerships and acting as catalyst and facilitator.

According to the World Trade Organization[v], **e-Commerce** is the sale or purchase of goods or services conducted over computer networks by methods specifically designed for the purpose of receiving or placing of orders. Even though goods or services are ordered electronically, the payment and the ultimate delivery of the goods or services do not have to be conducted online.

An e-Commerce transaction can be between enterprises, households, individuals, governments, and other public or private organizations. Included in these electronic transactions are orders made over the web, extranet or electronic data interchange. The type of transaction made is defined by the method of placing the order. Normally excluded are orders made by telephone calls, fax or manually typed e-mails.

2.5 STAKEHOLDERS

E-Government involves the active participation and contribution of a number of key players and stakeholders in the entire process. Important stakeholders include:



e-Government Stakeholders

Political Leaders

It is imperative that the top leadership in the Country is sensitized enough towards the need for electronic governance.

Government Departments/Bodies

Government departments at all levels (central and local) need to ensure backend integration of systems and processes to ensure a smooth and seamless transformation of the government to a digital state. Awareness and willingness among employees to embrace change plays a key role in the whole process.

Citizens

Citizens play a crucial role as they are the main beneficiaries of online information and services from the government and also contribute to the process of policy making by voicing their opinion and views electronically.

Private Sector

Collaboration and partnership between the government and the industry/private sector on e-

Government is to the mutual benefit of both. Business associations can help consolidate and coordinate input.

International Organizations, Academia and NGOs

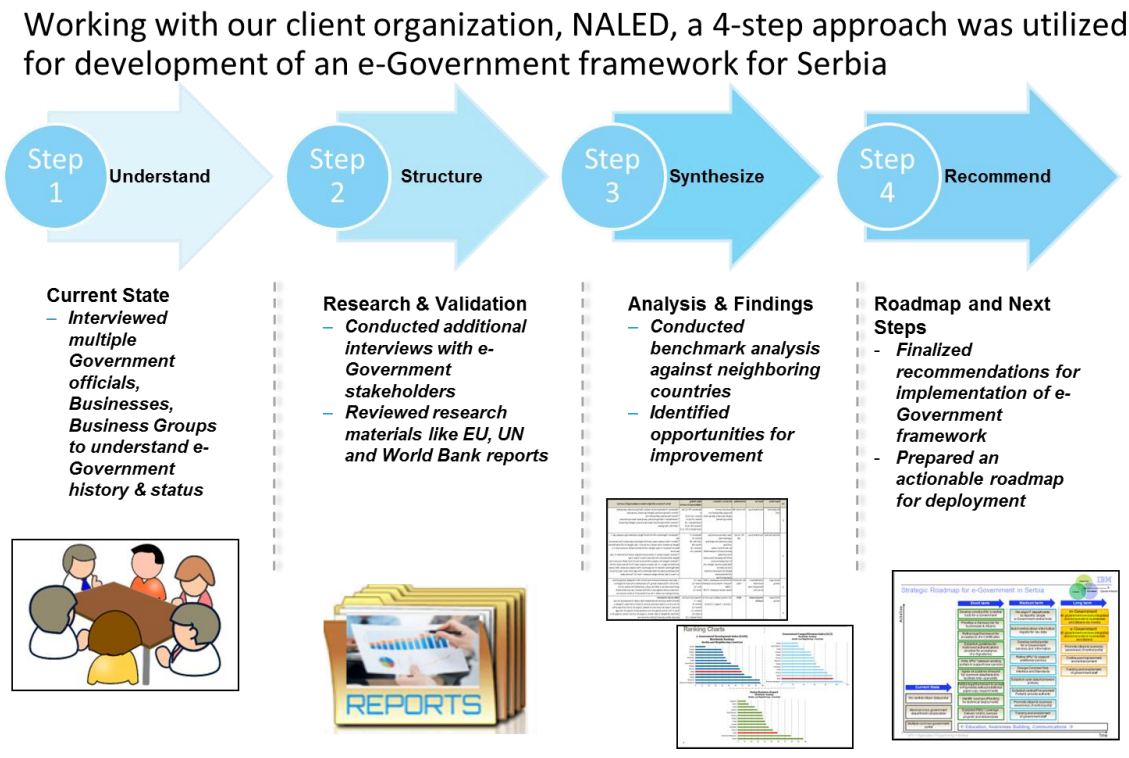
Through effective promotion of e-Government initiatives, these agencies can raise awareness in citizens and can also contribute by sponsoring or carrying out research in the area and exchanging best practices with other countries.

2.6 APPROACH

2016 is pronounced as a year of entrepreneurship and innovation in Serbia. Internet and Communication Technologies (ICT) is recognized as one of the most competitive sectors of the economy. EU funding is expected to be unlocked once the government has laid out a clear plan on how to go about implementation of e-Government in Serbia. Given this political climate & interest, the new government is likely to welcome a well-established platform for development of e-Government in Serbia as the basis for future expansion of the ICT sector and investments in country.

As an organization focused on developing the Serbian business environment, NALED is driving change for a positive business climate through the promotion of e-Government to improve efficiency and transparency. The IBM CSC Serbia 2 team worked with NALED to provide a strategic framework for expansion of e-Government in Serbia. This framework outlines key recommendations for continuing the transformation of Serbia via e-Government programs and initiatives. NALED can use these recommendations to create a consensus amongst stakeholders and allow the quicker adoption, and hopefully implementation, of various components of e-Government. This framework will support the strategy described in the document "Serbian Electronic Government Development Strategy 2015 – 2018".

The team used a 4-step approach to develop the framework for e-Government and to provide recommendations for ongoing transformation in Serbia.



1. To understand the current state, the team conducted interviews of stakeholders from the government, business groups and business associations identified by NALED. The meetings provided a good view of "current state" of e-Government in Serbia, issues & obstacles encountered by multiple stakeholders and identified potential solutions.
2. As a second step, reports published by World Bank, UN, EU etc. were researched to understand Serbia's comparative position in the deployment of e-Government initiatives. Relative rankings were analyzed and several best practices gathered from other e-Government implementations. In addition, existing strategic analyses conducted by NALED and the Serbian government were reviewed.
3. As the third step, findings from the interviews, primary & secondary research were analyzed to develop a framework. Key Enablers required to ensure successful and timely implementation of the e-Government environment were identified. Benefits, with examples from other countries, were outlined.
4. Finally, we provide specific recommendations for continuing the effort and suggest areas of research or specific data that can be collected by NALED in the following months that will be beneficial to this initiative.

We have also outlined a methodology for prioritizing various initiatives for implementation. To ensure that a large transformation like e-Government can be successful, we suggest a communications plan directed towards various stakeholders and participants. A methodology to track progress of initiatives and measurement criteria to determine success is suggested.

In the subsequent sections, we describe our observations, findings and analyses leading to recommendations for implementation of an e-Government framework for Serbia.

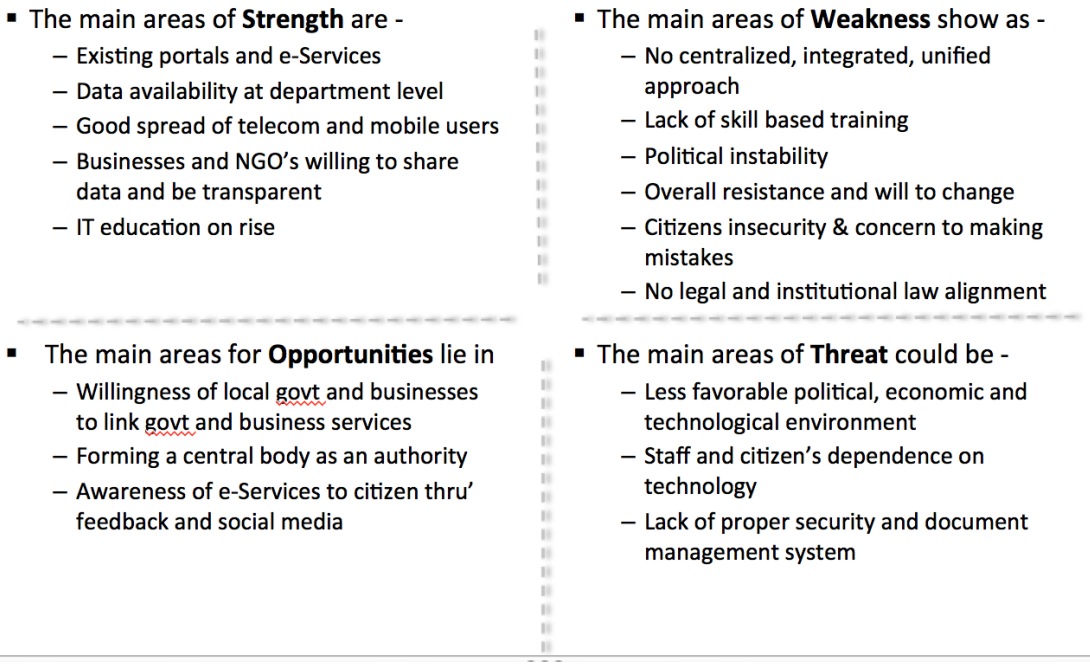
3 THE FRAMEWORK FOR E-GOVERNMENT IN THE REPUBLIC OF SERBIA

The input of stakeholders from the government, business sector, and the international community has been gathered regarding the current state of e-Government in Serbia. We have consolidated and analyzed this information to come up with the common themes. We then researched several global reports for rankings and best practices. From this analysis we have come up with several recommendations to include as part of the Framework for e-Government. We close this section with a suggested action plan to implement the Framework.

3.1 SWOT ANALYSIS

SWOT analysis is employed to discuss strengths (S), weaknesses (W), opportunities (O) and threats (T) for implementation of e-Government in Serbia.

Using information gathered from interviews and briefings, a SWOT-analysis has been done to assess the current and prospective states of e-Government in Serbia.



SWOT Analysis

Strengths

The strengths of Serbia to develop and maintain e-Government lie with the existing portals and e-Services that are working fine and the data availability with each department. Willingness and acceptance of data sharing and transparency from businesses, NGO and international communities is a plus. Serbia has good number of telecom and mobile users, IT education and skills on rise are instrumental in strengthening it further.

Weaknesses

The weaknesses of the e-Government efforts lie in that there is not an integrated, but rather a vertical approach to the services; this translates into an inconsistent use of data and services. Serbia faces some political weaknesses. Technologically, less IT-savvy people and the older generation are

afraid of computer related problems. Some government websites are not user-friendly. Traditionally, the feeling is that the Serbian government wants to introduce new methods and e-Services but due to changing political scenario, it keeps pushing it off. This too hinders the alignment of legal and other laws to happen. Other weakness is that of public feeling of insecurity and concern about making mistakes and being fined. This discourages citizens from tapping into e-Services.

Opportunities

There are many opportunities for the Government to explore. The political willingness of local government, businesses and other communities to build and link government and business services, to increase the collaboration between its affiliates including data mining, analysis and exchange of both internal and external data create an opportunity for governments in the region to show their commitment to e-Government.

The optimization of existing websites and social media will create an increased awareness of the e-Services and will generate traffic towards the portal. Installing a proper feedback system, including social media, will create a Government/citizen partnership. There is the opportunity to create a Single Stop Shop secured Governmental portal, which, in the future, can be extended to mobile platforms.

Threats

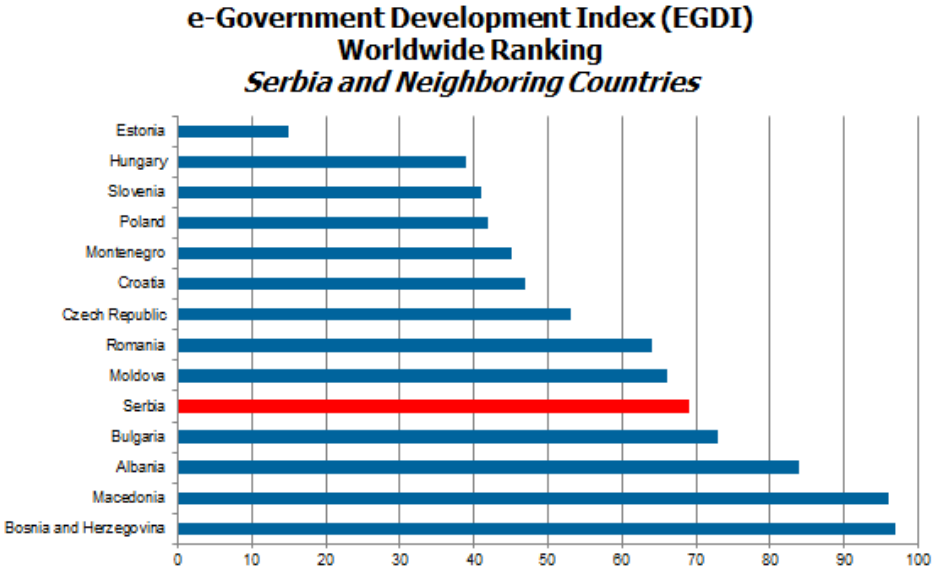
There are some points that could lead to Serbia users turn away from e-Services. Due to less favorable political, economic and technological environment, it is taking a longer time for the Government to adopt and focus on e-Services. The dependence of citizens on technology may produce the adverse effect. For example, if citizens/users are not well equipped with IT skills and knowledge, it can take them hours to do a small job.

Network problems are also a major barrier. Security-issues could turn out to be a major threat as well. Lack of proper security and document management system may pose threat for computer viruses, worms and computer bugs. This discourages users from storing data and information online. Furthermore, a proportion of Serbia may not have equal opportunity to access the Internet even though the number of Internet users is increasing socially.

3.2 GLOBAL RANKING REPORTS AND HOW SERBIA CAN IMPACT ITS RANKING

Report Name	Serbia Ranking		Key Factors / Indicators	Strong Points / Improved Areas	Improvement Areas
	Worldwide Ranking	Neighboring Countries (out of 14)			
United Nations (UN) e-Government Development Index (EGDI)	69 (out of 192)	10/14	1 .Online Service components, 2. Telecomm Infrastructure component, 3. Human Capital component	Human Capital components such as adult literacy, gross enrolment ratio, etc.	Online Service components such as integrated online service delivery, increasing emphasis on the provision of effective online services, expansion of e-participation and mobile government, etc.
World Economic Forum Global Competitiveness Index (GCI)	94 (out of 140)	13/14	A. BASIC REQUIREMENTS: Institutions, Infrastructure, Macroeconomic Development, Health and Primary Education B. EFFICIENCY ENHANCERS: Higher Education and Training, Goods market efficiency, Labor market efficiency, Financial market development, Technological readiness, Market size C. INNOVATION AND SOPHISTICATION FACTORS: Business sophistication, Innovation	Health and primary education, technological readiness	1. Institutions (120/140), 2. Macroeconomic environment (125/140), 3. Goods market efficiency (127/140), 4. Labor Market efficiency (118/140), 5. Financial Market development (120/140), 6. Business sophistication (132/140) 7. Innovation (ranking 113/140)
World Bank Doing Business Report	59 (out of 189)	12/14	Starting a Business, Dealing with Construction Permits, Getting Electricity, Registering Property, Getting Credit, Protecting Minority Investors, Paying Taxes, Trading Across Borders, Enforcing Contracts, Resolving Insolvency	Dealing with Construction Permits, Paying Taxes	1. Enforcing contracts, 2. Registering Property, 3. Protecting Minority Investors
World Bank and UNDP Open Data Readiness Assessment	Good / (Better, Good, Poor)	N/A	Availability of Key data Sets - Inspection reports / rulings (public health inspections, safety inspections, food safety inspections, etc.), Company/business register, Detailed national map / geodata, Cadastral register (land plot demarcation, land / home ownership), Construction data (building permits issued / applied for, zoning	Societal demand for open data, Civil engagement and capabilities for open data , National tech and skills infrastructure	1. Senior Leadership 2. Legal and policy framework 3. Funding open data program

In order to gauge Serbia's relative progress and status regarding e-Government initiatives, it is helpful to refer to several indexes that provide global rankings based on various criteria. From these rankings it can be determined how Serbia compares to peer group countries as well as identify top ranked countries to use as aspirational models. Based on the criteria each report uses, recommendations can be concluded on actions that Serbia can take that will improve their ranking in subsequent editions of these reports.



According to the UN e-Government Development Index[vi], Serbia is in a good standing overall in a global perspective, ranking 69th. However, in comparison to other European countries, Serbia lags behind, ranking 38th among 43 countries; 4th to the last country among 14 Southern European countries and 10th among 14 neighboring European countries.

Some of the positive influences to the ranking position that were mentioned are a past and present investment in telecommunication, human capital and provision of online services. Spain was able to make significant gains, improving its position from 23rd to 12th in the global ranking and from 15th to 5th in the European ranking as the result of long-term e-Government planning. In 2005, the country unveiled the Plan Avanza, its first information society strategy and in 2010 Plan Avanza 2 was launched aimed at positioning Spain as a leader in the use of advanced ICT products and services.

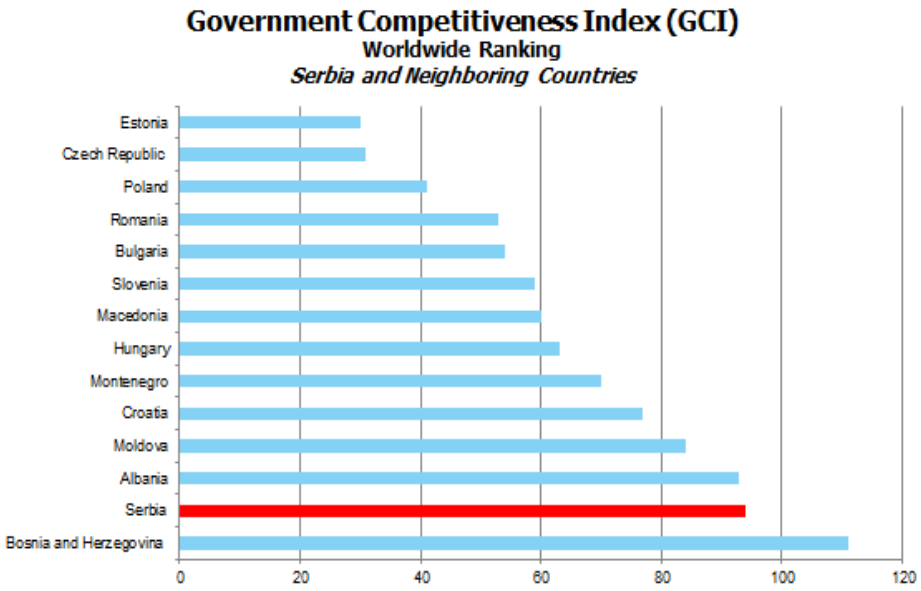
The top 3 countries (Korea (1st), Singapore (3rd) and France (4th)) in online service delivery component of the eGDI stand out for their integration of e-services, expanded roll-out of mobile applications and provision of opportunities for e-participation.

France ranks well in online service delivery component due to its ongoing actions to improve the quality of public services, integrate governmental websites and encourage consultation with citizens on both public policy and service delivery methods. The official website of the national administration (servicepublic.fr) directs individuals, businesses and associations to relevant services by event as well as by subject, invites ideas about administrative simplification, connects citizens with current debates and consultations and facilitates interaction with government through single sign-on.

New Zealand's public service has committed to offering easy access to government services in an online environment. The Government aims to have all new services offered online by 2017 through its Government ICT Strategy and Action Plan to 2017. At the same time, it continues to recognize the importance of face-to-face interaction for those without Internet access.

Another country which Serbia can learn from is Montenegro whose ranking improved from 57th to 45th. As with many other countries in the region that have improved their ranking significantly, Montenegro has also directed its efforts to e-government. At the end of 2011, the country launched its Strategy for the Development of the Information Society 2012–2016 and has inaugurated several e-government initiatives, including a business licensing e-registry portal.

Another approach to improve Serbia's ranking in this index is to provide portals on open government data and e-participation as well as for businesses. This increases the number of 'core' e-Government websites to a handful, moving beyond the idea of single 'one-stop-shop' portals. This approach helps to provide more targeted, while connected and user-friendly portals to different users, with the amount of information and services made available by governments increasing continuously. Serbia should continue its efforts to make online services ever more user-centric, while ensuring that those who cannot use online services are not excluded and also fully embrace the opportunities of e-participation. The experience of some of the top performing countries in the region, as well as the countries that have improved their ranking significantly, shows that long-term and holistic strategic planning in e-Government brings about tangible results. The lesson that can be learnt from the region as a whole is that embedding e-Government in wider socio-economic development frameworks is crucial to successful e-Government.

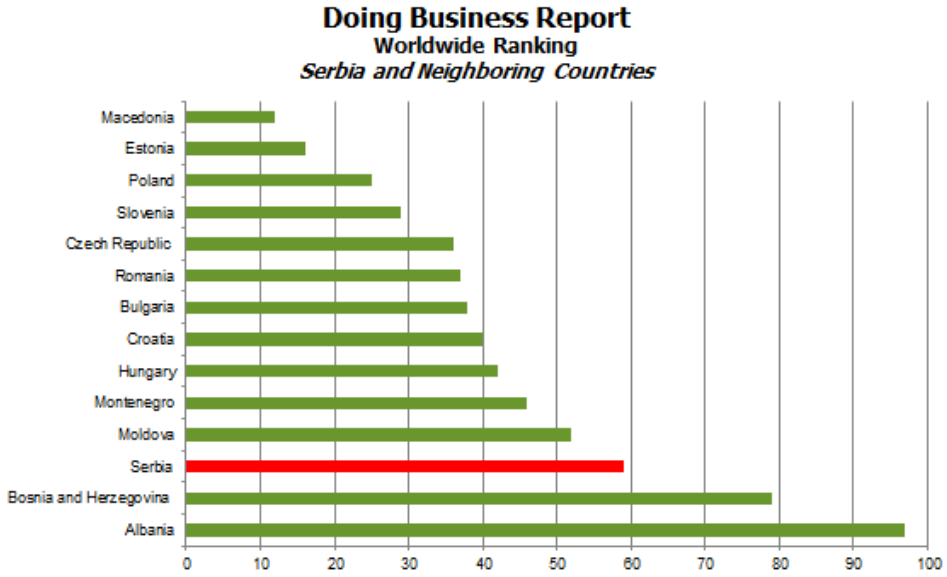


On the Global Competitiveness Index[vii], Serbia maintained its rank at 94 for two consecutive years. In comparison to its neighboring countries, out of 14 countries, Serbia is lagging behind being at the second to the last. Only Albania (93rd), Serbia (94th), and Bosnia and Herzegovina (111th) are outside the top 80. Gaps are particularly wide on technological readiness, with the Baltics outperforming Southern Europe. Lithuania leads the region in technological and ICT adoption and innovation, with less promising trends in countries such as Albania, Turkey, and Bosnia and Herzegovina. Areas in which Serbia needs to have particular focus are business sophistication, innovation, financial market development, and labor market efficiency.

All countries need to continue implementing structural reforms to achieve higher levels of competitiveness. In particular, all would benefit from improving the flexibility of their labor markets (with the possible exception of Hungary), developing the financial sector, and reducing red tape, which is reported as one of the most problematic factors for doing business in the region.

A recent study[viii] was performed that found a strong correlation between the e-Government Readiness Index and the Global Competiveness Index. This study aimed at empirically relating the competitiveness image of a country to the level of e-Government readiness. The study found a strong relationship between the ICT infrastructure capacity and maturity and the development of e-Government portals and the competitiveness of the country.

According to the Open Data Readiness Assessment by the UNDP[ix], Serbia is well positioned to move forward on its Open Data initiative as laid out in the Government's e-Government Development Strategy. It is also perceived that Serbia is moving well ahead on its sustainable development goals. While not a regional leader in this area, the country is well positioned for continued progress regarding open data and increasing transparency of state authority operations.



From the World Bank Doing Business 2016 report[x], we can determine that undertaking actions or implementing systems that reduce process steps or duration of a process can improve Serbia's ranking. In the past year, implementing the Construction e-Permitting system both reduced process steps as well as shortened the duration of the overall process resulting in improving the ranking by 9. Additional steps are already underway to further improve this process by enabling electronic payment of associated fees that will contribute to further advancement of Serbia's rank in this assessment. Compared to neighboring countries, Serbia ranks relatively low within this report.

In the World Bank Starting a Business assessment[xi], Serbia rank went down by 3 compared to the previous year. This is partly due to improvements made by other countries as well as the need for further process reforms within Serbia to improve the process of starting a business. Implementing specific measures to reduce the overall duration of this process and reducing the number of steps the business founder must perform will positively impact Serbia's performance on this index. Higher ranked countries have achieved success in this process by making several steps take a single business day or less to complete. For instance, Moldova has reduced the procedure of registration of the legal entity from 5-7 business days to 1-2 business days by automating part of the process. In

Slovenia, the business owner can deposit capital in the bank and get a receipt the same day. Registering for State Health Insurance in Estonia is now done online and takes less than a day to complete.

We'd like to share some details about one of the top rated e-Government systems in the world, Estonia's X-Road system, as included in the World Bank Digital Dividends report[xii].

"Estonia's X-Road is an internet-based e-Government system that enables participating institutions, including private business, to communicate and exchange data[xiii]. It serves as a platform for application development by providing numerous common services to users, including query design, query tracking, and data visualization. Its open design is protected by digital authentication, multilevel authorization, log monitoring, and encrypted data transfers. This collective process improves the user experience and motivates state institutions to develop digital services and people to tap into digital government services. The common goal is to shift activities from the physical world to the much more efficient digital realm.

X-Road's utility is evident in its exponential growth. The system launched in 2003 with 10 participating institutions. By 2013, almost 900 had joined—70 percent are national or local government agencies, and the remainder private firms. The annual number of queries through X-Road rose from half a million to 340 million. In 2014, two-thirds of queries were automated system-to-system exchanges. The remaining one-third, about 113 million human queries, reflects enormous demand for e-services from a population of only 1.3 million.

The system's main strength is that it is decentralized. Participating institutions retain ownership of their data, but can share it or access other institutions' data as necessary. Estonia's Public Information Act prohibits institutions from requesting user information already stored in a data repository connected to the X-Road[xiv]. Thus the system's architecture—coupled with complementary policies—has reduced the need for repetitive data entry, increased government efficiency, and reduced costs to users. If e-services are assumed to yield 30 minutes in time saved per interaction (for the service provider and the citizen) relative to predigital physical interaction, the number of applications in 2014 implies a savings of more than 7 million work days a year—5.4 work days for each citizen."

Additional details regarding these rankings and regional comparisons are available in Appendix 3.

3.3 RECOMMENDATIONS

Synthesizing findings from interviews with key stakeholders and analyzing research reports on e-Government, a set of recommendations are provided for the framework for e-Government in Serbia.

3.3.1 Institutional Framework

A common theme from our interviews and reviewing various data sources, such World Bank and UN, is that a key element to a successful e-Government implementation is to have a centralized body that manages and oversees the e-Government framework.

This body needs to be independent and should have the political and institutional authority to create and enforce guidelines, rules and definitions, as well as facilitate the sharing of data between government institutions. Whichever option is chosen to form this central body, it needs to have representation from the government institutions that govern e-Government, e-business, and ICT, local municipalities, and the National Assembly. In addition, it is important that the input of the business community also be included; so it is recommended that a Joint Working Group, similar to the Fair Competition Alliance, be established so as to incorporate the input and requirements of the private sector. Key to the success of this central body is to establish a Project Management Office (PMO) that will be able to administer, track and manage the various components of the e-Government framework. The PMO can coordinate between various ministries and data owners, establish common measurements and Key Performance Indicators (KPIs), report on progress to the Prime Minister and ensure participation of all key stakeholders in any particular e-service or process. The PMO could also provide Project Management assistance with the implementation of e-services or systems as needed.

The central body should be involved in the writing or revision of any laws pertaining to e-Government systems, regardless of which government institution owns the individual law. This will help ensure that different laws are not duplicating or covering overlapping aspects of the law as well as ensuring that the law represents all stakeholders, not just one particular viewpoint. As an example, there is currently under development two laws, one covering e-Government and the other covering e-Business. Since they are being developed independently, it is unclear what the scope of each law is and whether both will cover e-signature or some other common topic, or both will exclude a particular topic that should be covered. The central body could ensure these two laws are developed with awareness of each other and that they don't contradict each other and are compatible in their scope.

The independent central body should be empowered by the Government to facilitate and enforce cooperation between different institutions to share data, where allowed by law, and mediate negotiations as necessary between ministries or data owners. Common rules, guidelines and definitions regarding e-Government systems would be defined by this central body and compliance would be reported by the PMO.

It would also be possible for this central body to act as a Center of Competency for ICT skills and system implementation that could be leveraged by all government institutions to augment their own separate ICT staff and capabilities. There needs to be sufficient capacity within the population of IT skilled individuals, particularly with IT Architecture and Engineering skills, to be able to build and maintain the infrastructure for the e-Government systems. Another key area where skill capacity is needed is Project Management.

While the specific location within the government and structure of this central body needs to be determined by the Serbian government based on their own requirements and political environment, it should be noted that 42% of UN Member States report having a Chief Information Officer (CIO) for e-Government and 56% of European countries report having a CIO. The United Nations E-Government Survey [xv] has focused on CIOs. The institutional level of CIOs as well as the office's functions, roles and responsibilities seems to have an important impact on the overall sustainability of whole-of-government approaches and collaborative governance. The importance of the CIO or its equivalent is to create a unified and centralized agency responsible for designing, implementing and disseminating e-Government throughout the entire public administration in a seamless way. This analysis also falls in line with the data analysis of countries with a CIO or equivalent; proving that a unified, consistent and identifiable authority managing e-Government can have a positive impact on a country's performance and the quality of their e-service delivery.

3.3.2 Establish common data definitions for interoperability

We heard from many different stakeholders that the sharing of data was being hindered or stopped entirely because of varying ways of storing data in separate systems. One of the greatest challenges to promoting effective collaborative governance is that too much emphasis has been placed on interoperability as being merely a technical issue. To support the exchange of data, there will also need to be some co-operation of business processes between institutions. Interoperability is vital if e-Government services are to be rolled-out in a shorter time, at a lower cost and be delivered in a seamless way across Serbia.

A common practice for EU Member states is to aggregate their e-Government services around "life-events" or "business-episodes". Simply put, this means that the service is organized around an event that makes sense to the customer, be they a citizen or an enterprise, and that the customer need not be aware of the various public administration bodies that cooperate in seamlessly delivering the service. It is clear that agreement on common standards and specifications is essential to support life events and information sharing e-Government services.

There are three aspects to interoperability[xvi] that allows information and computer systems to be joined up within and between organizations.

- **Technical Interoperability** - which is concerned with the technical issues of linking up computer systems, the definition of open interfaces, data formats and protocols, including telecommunications
- **Semantic Interoperability** - which is concerned with ensuring that the precise meaning of exchanged information is understandable by any other application not initially developed for this purpose
- **Organizational Interoperability** - which is concerned with modeling business processes, aligning information architectures with organizational goals and helping business processes to cooperate

To ensure technical interoperability of ICT systems and efficient data sharing it is necessary to establish common definitions of interfaces, data formats and protocols that will be used. This involves specifying the data types and their key attributes, the technical protocol that will be used and the network path that connects the systems. Before data can be shared it has to be reformatted or converted, which requires additional analysis, programming, effort and introduces possibility of variability in the data. Once common data definitions are established, the sharing of data between systems will be streamlined, efficient and reliable. In addition to the technical details of the data

being shared, it is necessary to ensure the meaning of the data will not be changed as that data is used by different systems.

It is this combination of agreed rules on standards and on processes, coupled with well-defined agreements on the roles, duties and responsibilities of all parties involved (whether at the European, national, regional or local levels) that provides the foundation for the successful realization of e-Government.

An example where this is needed today is the establishment of the Inspection Controls system. This system has to support many different inspection processes that operate independently today. To build an effective and efficient system, it will be necessary to establish common definitions on how the data is represented and stored in the system so that the data can be shared between the various systems.

Furthermore, the interoperability of databases and the information they contain would allow public administration to implement 'value added' client- centric services that cannot be implemented on disaggregated information. These would typically involve the provision of client-specific services that can only be determined when client data from multiple sources is aggregated and evaluated as a whole. But the sharing and exchange of information raise important data protection and privacy issues. These must be suitably addressed if e-Government services based on information sharing and aggregation are to gain acceptance and usage. This in turn may well have serious implications for interoperability policy to ensure that privacy concerns can be met while providing such e-Government services.[xvii]

Failure to put in place interoperable e-Government systems will have both economic and social costs. These include: static unresponsive public administrations that are expensive to run and are unable to implement policy in an effective and timely manner; the inability to develop value added e-Government services based on sharing information from multiple heterogeneous resources; and higher costs and a greater administrative burden for Serbia's enterprises.

Since these interoperability aspects need to take into account the needs of various systems and stakeholders, the central body mentioned in Section 3.3.1 should drive and coordinate the establishment of the definition of these aspects to ensure appropriate input and consensus. In addition to government institutions, the perspective of the data submitter (citizens, businesses, other institutions) needs to be taken into account as well.

3.3.3 Establish Systems of Record

To mitigate against issues of lack of a single repository of information and data quality, we recommend having a system of record i.e. a 'single source of truth' for key attributes required in multiple transactions.

By setting up a system of record, three variations of issues can be addressed.

- For attributes that are collected in multiple registers and/or forms, establish one database as the 'system of record' Example: CROSO today gets the "Address" field from three different data sources and they don't exactly match. They now have to spend significant effort to try to determine which data is correct. If one data source was designated as the System of Record for Address information, there would be no additional work necessary.
- For attributes that do not exist in a single national registry, establish one national registry for information. Example: Person registry with birth data & full names

- For similar data types that exist in separate databases, establish legal framework to share data. Example: Health registry linking names and National ID number;

It is important to consider the interaction between the central government & local governments and ensure a co-operative approach to the implementation of systems like "central registry".

3.3.4 Training and Transition

Based on inputs from several interviewees, Serbian government institutions typically approach issues within their "silos" and issues are tackled through a sectorial perspective versus a collaborative perspective. At the same time, citizens and businesses are demanding more open, transparent, accountable and effective governance, while new technologies, especially ICT, are enabling effective knowledge management, sharing and collaboration between all sectors and at all levels of government whether cross-border, national or local.

The success of any large transformation program depends on effective change management and communications to stakeholders. The adoption of a unified strategy of e-Government in Serbia is one such large ongoing transformation. For ongoing success of e-Government initiatives, comprehensive stakeholder management, training and communications are essential.

While breaking down organizational silos is easier said than done, as recommended in Section 3.3.1, a central body is key to the development and management of e-Government policies.

In addition to governmental change, benefits of electronic services should be highlighted to citizens through marketing & communications efforts. Sometimes citizens prefer face to face interaction to electronic submission. By highlighting the benefit (savings in time, cost etc.), e-services can be promoted to citizens. It must be noted that Serbia has a very large percentage of internet users for leisure; it is not a stretch to expect that more business be conducted through electronic means by highlighting relevant benefits.

Some other factors to consider as part of managing transition is the recognition that many long term governmental employees are reluctant to embrace technology; in such cases appropriate training needs to be administered on technology & for deploying e-Government initiatives. By addressing concerns about role changes with the adoption of technology, it is possible to promote an affirmative attitude towards the acceptance of electronically approved documents.

As outlined in the UN e-Government survey of 2014[xviii], a number of enabling factors are needed to advance whole of e-Government.

- First, there is a critical need for new forms of collaborative leadership and shared organizational culture, including re-shaping values, mindsets, attitudes and behaviors in the public sector through visible guiding principles and leadership.
- Second, new forms of institutional frameworks for effective coordination, cooperation and accountability need to be put in place across government, between governments and with relevant non-public actors which can contribute to creating public value.
- Finally, and often underpinning the other enabling factors, it is essential to harness the power of new technology through appropriate ICT management strategies for enhanced collaboration. The global spread of the Internet and the application of ICT in government, as well as greater investments in telecommunication infrastructure coupled with capacity-building in human capital, can provide opportunities to transform public administration into an instrument of collaborative governance which directly supports sustainable development outcomes.

3.3.5 Open Data Framework

Within Serbia, open data framework is stated as a priority and efforts led by several ministerial stakeholders have been initiated. A piece of data is open if anyone is free to use, reuse, and redistribute it – subject only, at most, to the requirement to attribute and/or share-alike. We recommend that efforts to promote open data frameworks be accelerated.

European Commission in their Digital Single Market study[xix] support open data for 4 reasons:

- Public data has significant potential for re-use in new products and services
- Addressing societal challenges – having more data openly available will help discover new and innovative solutions
- Achieving efficiency gains through sharing data inside and between public administrations
- Fostering participation of citizens in political and social life and increasing transparency of government

Through assessments conducted by World Bank, it has been found that a wide range of Serbian government bodies are willing to move forward with open data as a means to increase government effectiveness. Several institutions, such as in particular the Ministry of Public Administration and Local Self Government, Ministry of Finance, Ministry of Interior, Ministry of Education, Statistics Office, Public Procurement Office, Agency for Medicines and Medical Devices, the Public Policy Secretariat, the Serbian Business Register Agency, and CROSO showed willingness during and after the Open Data Readiness Assessment [xx](ODRA), while being realistic as to their current situation and opportunities.

This provides strong opportunities for straightforward pilot projects, which in turn will provide the experience and motivation that will bring other agencies to the table as well. According to World Bank estimates, opening of data on the level of the European Union would increase the business activity to up to EUR 40 billion per year, and it is estimated that 80% of the overall benefit from open data would be obtained directly by citizens, business sector and the investors.

Fostering a stronger collaborative attitude between government agencies, civil society and the business and developer communities will allow a more successful open data program.

A successful national open data initiative in Serbia will require:

- Raising significantly greater awareness across government on what open data is and its potential as a policy instrument, thus creating more collective political commitment and sustained central leadership across government.
- Exploring creatively the possibilities of funding an open data program, or building blocks thereof, through both existing programs in e-Government and administrative reform, as well as collaboration with donors (in both existing projects to strengthen public service and societal impact, and in specific open data projects).
- A strong collaborative effort between government agencies, civil society and the business and developer community, to build more trust between government and non-government stakeholders.
- Leveraging the small clusters of relevant IT and data expertise across a wider section of government bodies.

3.3.6 Legal Alignment – e-signature and e-document acceptance and validity

According to NALED analysis, there are over 100 related laws and by-laws that need to be updated or modified to align with the e-signature and e-document laws. These are cases where other laws indicate that a paper form or a seal is required as proof or evidence of compliance with that law. It is necessary to ensure that other laws and by-laws be aligned with any new e-Government related

law. As an example the Law on Administrative Procedures which went into effect on March 9, 2016 will also require other laws or by-laws to be changed to be in compliance with the new law.

Laws and practices need to be updated to ensure the acceptance and validity of e-documents and e-signatures in the judicial system, inspections, and enforcement processes. In some cases, the law clearly states that the e-document is official and valid, but the practice or local procedure of the inspector or other government official is to only accept a paper document.

The acceptance of e-documents and e-signatures also needs to be bi-directional. If the submission is allowed to be electronic, then the remission and distribution of that document must also be allowed to be electronic.

When new laws are adopted, it is also necessary to ensure the Judiciary system has a listing or database of what laws are affected or modified by the new law so that they can rule/judge accordingly.

3.3.7 Multi-Level Authentication and e-Certificates

A pain point that was consistent in interviews was the current implementation of the e-Signature certificate system. It is a cumbersome, technically complex system that drives a lot of frustration for users and hinders widespread usage as a result.

A recommendation is to establish a multi-level authentication system whereby different authentication/approval/signatory methods can be used for different processes. The law(s) can specify the appropriate level of authentication required based on the risk/value of the process, while leaving the specifics of the actual factors used to be determined by the implementer and current technology.

The following table illustrates the various types of factors that can be used in an authentication system.

Authentication Key factors

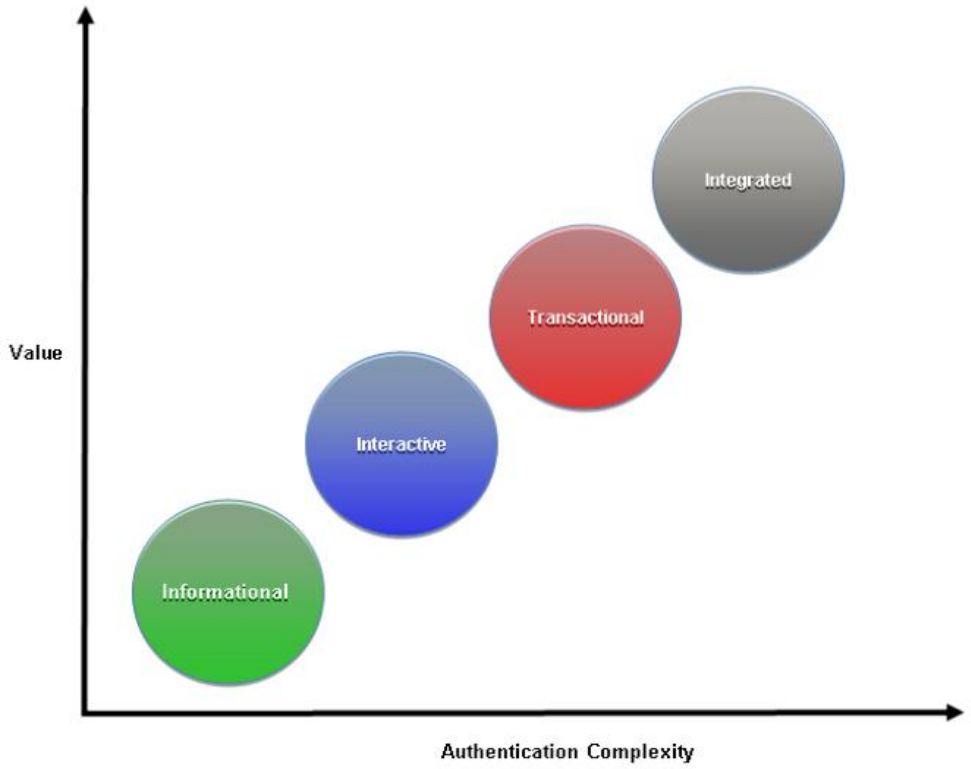
FACTOR	DEFINITION	EXAMPLES
Knowledge Factor	Something only the subject knows	password, PIN or pattern that the subject knows and produces when challenged
Possession Factor	Something only the subject has	tokens, Magnetic Stripe Card, Smart Card, Mobile Phone
Inherence Factor	Something only the subject is	biometrics information such as iris pattern, finger print etc

There are five categories of factors as defined by the State Service Commission of New Zealand Government.[xxi] These are: Password, Hardware Token, Software token (the existing Serbian e-Certificate system is an example), One Time passwords, and Biometrics.

For different processes, varying numbers of factors can be required to establish authentication.

Single-Factor	For example, to add credit to public transport Nol card of Dubai, it takes only password, which is a knowledge factor.
Two-Factor	This uses two of the three factors of authentication. For example, in most of the financial transactions to pay for a public service, usually two-factor authentication is used. The first factor is typically a password (knowledge) and then a token generated or mobile phone received key (possession). To enter a foreign country you may require two-factor authentication by supplying your passport (possession) and biometric such as iris scan (inherence).
Three-Factor	This case uses all three factors of authentication. For example, to enter a secured site or a government building, a guard may check the face of the entrant (inherence) against stored image, swipe an access card (possession) and enter a four-digit code (knowledge).

The notion and nature of authentication changes for different stages of services. While many different service type definitions are in place in the context of e-Government, one of the most popular service type definitions came from Chandler and Emanuels.[xxii]



With Increasing Value Public Services Require More Complex Authentication

The **Informational** service type is the provision of information about government services, policies and agencies online. It is a one-way communication from government to the subjects. Usually Informative type of service does not require authentication since governments want to freely disseminate information.

At the **Interactive** stage the citizen or subject may engage into basic level of interaction with the government. Such service may provide specific information about a subject instead of generic information. Example of such service is to get the health records or tax records for a subject.

This type of service requires establishment of subject's identity before serving. Thus authentication is must. In ideal situation the authentication should happen against the national register with the national unique identifier. However, usage of other identifiers such as domain specific ID, system specific ID, or in some cases Open ID[xxiii] may not be rare.

The **Transactional** type of service allows performing transactions of value between government and subject. Examples of such services are filing tax return or accessing benefit payments. The type of authentication would be similar to interactive service. However, additional level of security, such as multifactor authentication for financial transactions may also be applied.

The **Integrated** type of services often integrates multiple government agencies and departments to deliver value to the subject. Many governments offer single window system to set up business. Internally that 'single window' combines multiple government agency services together to make it hassle free for the entrepreneur. This single window service is an example of integrated type.

Because of involvement of multiple agencies and their corresponding system of records, this type of service may require multiple authentication, thus most complex. An easier option is to implement

single-sign-on (SSO). But interagency SSO implementation in uniform fashion is difficult to achieve and may not exist.

Another method of capturing an electronic signature is the use of a "Pen-Pad", which is a digital input device that captures the pen strokes of the user. This method captures more than just the resulting image of the physical signature of the user, but can also capture attributes such as pressure used and speed of the pen that can be used in addition to the visual appearance of the signature to verify identity of the user.

Electronic certificates are beneficial as a very strong form of authentication and can be used for a variety of services. Qualified electronic certificates have been regulated by a legal framework and issued in Serbia for several years now. Currently five authorized agencies can issue electronic certificates. However their acceptance has not been according to expectations due to a variety of factors.

For example:

- Certificates are not compatible with each other. Technical (Java) compatibility issues cause burdensome installation & uninstallation procedures. Family members sharing an electronic device have to contend with uninstall and reinstall processes.
- Only certain types of electronic certificates are accepted by certain agencies, requiring procurement of multiple certificates by an individual / entity depending on the area of need
- The law calls for qualified electronic signatures created by e-certificates to be retained for a period of 10 years from the time of signing; however the actual e-certificates themselves can expire within a maximum period of three years. This creates a gap in being able to validate the electronic signature.

It is recommended that:
a) Operational factors be addressed to gain better traction on adoption of E-certificates.
b) The number of agencies qualified to issue electronic certificates be rationalized to make the process of securing & using them smoother.

3.3.8 E-Payments system

A system needs to be established to allow acceptance of e-payments for all government fees, services and taxes. The World Bank has established 10 Guidelines for Government Payment Systems[xxiv] that lay out the foundational actions and components that need to be implemented. The goal of these guidelines is that payments and collections made as part of existing or new government payment programs should support the sound, efficient and transparent management of public financial resources. Government payment programs should therefore be safe, reliable, and cost-effective. In addition, efforts to modernize government payment programs should be leveraged to accelerate the development of the national payments system more broadly, and to promote financial inclusion.

A. Governance, Safety and Efficiency	
Guideline 1	Ensure proper program governance and risk management: governance arrangements should ensure accountability, transparency, and effectiveness in managing the risks associated with government payment programs.
Guideline 2	Review and streamline treasury processes, then work on their automation: the treasury should devote extensive efforts to identifying all relevant needs with regard to improved safety, efficiency and transparency.
Guideline 3	Take full advantage of electronic payment methods: the extensive use of electronic payments in government payment programs can reduce costs and improve transparency and traceability.
Guideline 4	Create appropriate organizational arrangements to foster the continuous development of government payment programs: the national treasury/ministry of finance should consider engaging in collaborative schemes with the central bank and other stakeholders to identify additional improvement opportunities for these programs and, eventually, facilitate their implementation.
B. Legal and Regulatory	
Guideline 5	An appropriate legal framework with specific applicability to government payment programs can further underpin their safe and efficient operation: laws and/or regulations that provide clarity and certainty to the various parties involved, and that promote effectiveness and transparency in the execution of programs should be enacted/approved.
Guideline 6	Laws and regulations on payment instruments and systems, competition and consumer protection can also have an important bearing on government payment programs: the legal basis should support sound and fair practices in the market place, and be flexible enough to accommodate innovations.
C. Payment Systems Infrastructure	
Guideline 7	An appropriate payments infrastructure should be in place: the potential to obtain substantial benefits from migrating government expenditures and collections to electronic payments relies on there being the required payments infrastructures to process such payments safely, efficiently and at a reasonable cost.
Guideline 8	Maximize the potential of the available infrastructures through interoperability and widespread usage: payment service providers being able to channel their payment operations through any of the key mainstream infrastructures promotes efficiency, network expansion, and a level playing field for all players.
D. Cooperation and Partnerships to Leverage Government Payment Programs	
Guideline 9	Adopt a strategic approach to the development of government payment programs: the reforming of government payment programs has the potential to trigger the development of a robust payments infrastructure, which in turn will

	support the safe and efficient processing of government payments.
Guideline 10	Leverage on government payment programs to promote financial inclusion: the large volume of payments issued by governments, as well as the nature of some specific programs like social spending programs, represents an opportunity to promote or facilitate financial inclusion on a large scale.

Guidelines for the Development of Government Payment Systems: World Bank 2011

Serbia already has several e-Payment systems in place which should be reviewed against the above guidelines to ensure they are a proper foundation to build and expand upon additional e-Payment systems and services.

To illustrate the benefits and potential impact of an effective e-Payment system and specifically highlighting Guideline #3, we will use Brazil's "Bolsa Familia" program as an example. When Brazil changed to a centralized e-Payment system for disbursing payments to low-income families, it was able to reduce the administrative costs of the program by 75%.

It is also important to point out that implementing an e-Payment system leads to greater transparency and reduces corruption as it reduces the number of cash transactions and all payments are tracked centrally. Given the liquidity and transactional anonymity of cash, cash payments are subject to "leakage" (payments that do not reach the recipient in full) and "ghost" (fake) recipients, particularly in the context of government transfers. By moving toward digital payments, the traceability of the payment process is improved.

3.3.9 Centralized e-Procurement for ICT

Digital technologies can provide a new lease on life for transparency initiatives. Governments annually spend over US$9 trillion on procurement, at high risk of corruption, both in bidding and during contract execution. E-procurement is technically easy to implement, yet, developing countries have invested less in such systems than in the more complex budget and treasury systems—or have done so without the complementary reforms to deliver results. E-procurement also has the potential to galvanize substantial support from the business community by reducing barriers to entry, since it expands the market to new entrants, including international firms and by opening political space for reform. [xxv]

It is recommended that the existing procurement portal (http://portal.ujn.gov.rs) be the central place for requesting and managing all procurement transactions related to ICT. This central procurement activity can be used to leverage economies of scale and improve hardware and software compatibility, thereby improving overall transparency. E-Procurement facilitates Government-to-Government (G2G) and Government-to-Business (G2B) communication; this will permit smaller business to compete for government contracts as well as larger business.

Hardware and software infrastructure procured independently by different parts of the government, frequently leads to incompatibility for storage & exchange of data and to inconsistent security standards. In addition, this leads to sub-optimal use of funds provided through EU grants.

For the reasons mentioned above, it is recommended a central procurement strategy be followed.

3.3.10 Back office support for e-systems and alignment with new laws

We have found and heard of several examples where a new e-system is put in place, but there are still manual paper-based processes that feed into that e-system. These back office processes are not directly dictated or governed by laws, but are the internal governmental institution processes that are necessary to process information and provide services. When evaluating the overall e-Government framework scope, these back office procedures should not be neglected or dismissed as trivial. As much as possible, when developing any new system to support an e-service, the back office processes should be incorporated directly into that system. Where that is not feasible or immediately possible, then it needs to be captured as a future activity that still must be accomplished to truly gain all the benefits of implementing an electronic system. In some cases, the motivation to update will be self-generated by a department as they get frustrated by having to re-enter paper forms into the electronic system.

An example of this includes the e-permitting system which is entirely electronic. However, the input from various local entities is still generated by a manual process. Another example is that the Central Registry does automatic real-time verification of some information, but it takes 3 hours for a Tax ID to be verified from the Tax Authority.

3.3.11 Additional Recommendations

We also want to include some additional recommendations that came up through our interviews and research. It is important that the capacity and availability of IT skills to implement and support e-Government systems, including at the architectural level, is assessed and known. Government employees need access to technology, and the skills, attitude and knowledge to use it. A specific plan may need to be put in place to develop or attract additional skilled resources to have sufficient qualified personnel to develop and maintain the required e-Government systems.

When working with e-documents it is important to be able to know when they were signed and when they were submitted or remitted. An accurate time-stamp mechanism and process needs to be implemented that can assure accurate tracking and recording of when such actions take place. This time stamp system needs to be accessible by both the public and private sectors.

The topic of e-archiving has been raised in several discussions while developing this Framework. It is our recommendation that it is not necessary to implement a central e-archiving law or system. Rather, the storage and retention of the electronic documents and information is a built-in function of each IT system. The best method of retaining this information will vary based on the technology of the system, the type of data that is being stored and the required retention duration.

For example, birth certificate data needs to be able to be retrieved for the entire lifetime of an individual and even beyond, for genealogy and historical purposes. This could easily surpass 100 years of retention duration. Alternatively, tax returns might only be required to be retained for 7 years. The storage and retrieval system for this might be very different than the one used for birth data.

It is important that an IT system be compliant with the law dictating the retention period for information. In the case of birth data, care will need to be taken whenever systems are updated that existing data is carried forward in a format that will continue to be able to be retrieved and used. Storing data on media or data format that will be obsolete in 20 years, or certainly 100 years, will not do anyone any good. The data format will need to continue to be refreshed as technology changes over time so that the continued access and usage of the data remains.

As a further clarification on the storage and retrieval of data, it is not necessary to save an *image* or *exact copy* of a particular form or document. If all the data elements are stored in the database, the document can still be printed upon request and be a valid document, even though the exact image of that document does not exist within the database.

In summary, it is incumbent on the IT implementer of any ICT system that the system has appropriate function and capability to be compliant with the appropriate laws regarding data retention and retrieval. The exact technology, method and process of storing and retrieving that information is the responsibility of the e-system owner and implementer.

IT Security is always a concern when implementing new e-systems. Standards should be adopted for the minimum common security requirements for the e-Government system, while leaving the flexibility for individual systems or application owners to implement more stringent security measures for those systems that warrant it.

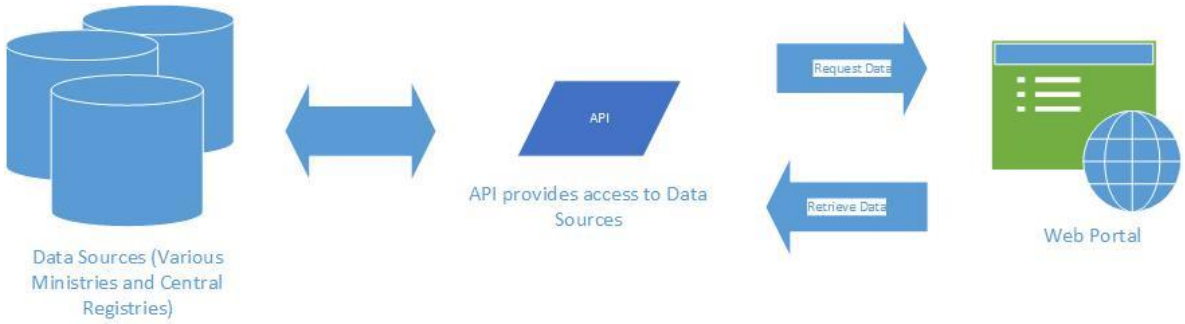


Illustration of API usage

It is recommended that as the overall e-Government system is implemented, that the use of Application Programming Interfaces (APIs) continue to be leveraged. The use of APIs enables separate independently developed systems to effectively exchange information between each other. Think of it like a human language but for software, so it really allows one software or application to communicate to another. This allows information, data and services to be exchanged more clearly and efficiently to build an application, access a feature or service, but with controlled exposure.

APIs are not experimental, more than half of all the traffic to major companies like Twitter and Facebook come through APIs. APIs are a better way to organize IT: APIs used internally can accelerate innovation by allowing everyone in the organization to use each other's assets without having to wait around for permission. Use of APIs can help avoid the need to create entire new databases/registries to store aggregated data, which entails data ownership concerns and additional ICT infrastructure costs. APIs are also a key component to enabling true Open Data availability.

In recent years, we've seen an unprecedented opening of government, and a sustained surge towards transparency. In the UK, we've seen the launch of data.gov.uk, which is a 'one-stop shop' of government datasets and statistics, ripe for analysis by statisticians, journalists and data scientists. In the US, they've also been steadily marching towards openness, but with a slightly different edge. Rather than just distribute their open data as excel spreadsheets and CVS files, they've chosen to use APIs.

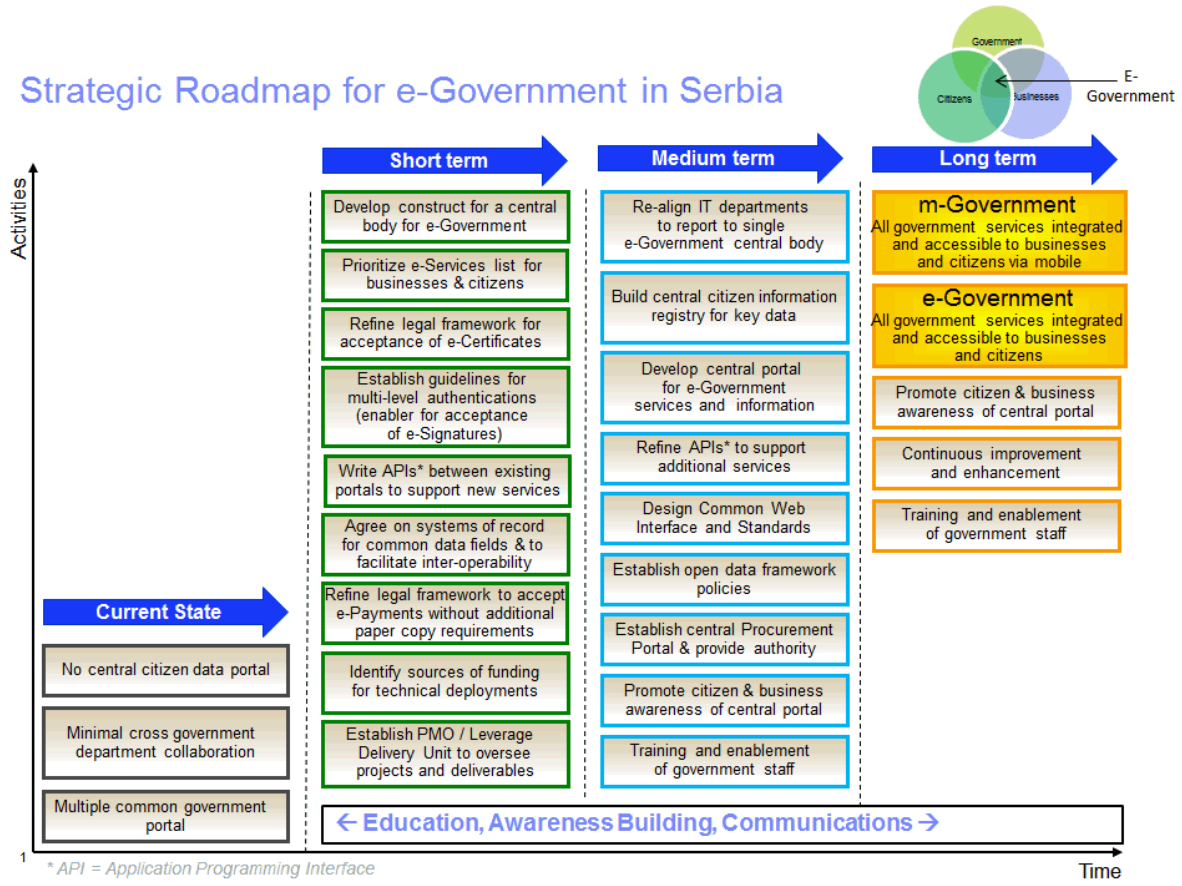
The background behind this lies in Executive Order 13571 issued by the Obama administration on April 27, 2011. Titled 'Streamlining Service Delivery and Improving Customer Service', it demanded that government agencies examine how they can improve the delivery of services, and emphasized

that this should be achieved with digital technologies. Shortly after that, Obama announced "Digital Government: Building a 21st Century Platform to Better Serve the American People", which defined how this content would be delivered to the American public. Namely, with an open API which would simultaneously act as the lynchpin behind a number of government IT projects, but also provide access to privately-developed applications.

3.4 Action Plan

In this section we portray a suggested order and timeframe to implement many of the actions and recommendations discussed within this paper. Many of these actions can be done in parallel and it is not necessary to finish all short-term actions before medium-term actions can be commenced. In terms of time, short-term can be thought of as going from immediately to about 6 months from now. Medium term can be interpreted as from 6 months to 18 months. Long Term is more than a year out.

Adjustments to the order and timeframes should be made as implementation plans are finalized and more detailed information about each activity is known.



4 BENEFITS OF IMPLEMENTING E-GOVERNMENT

In this section we summarize and highlight several of the benefits that can be gained by implementing e-Government framework.

1. According to World Bank: [xxvi] Digital technologies can help improve government capability and citizen participation by:

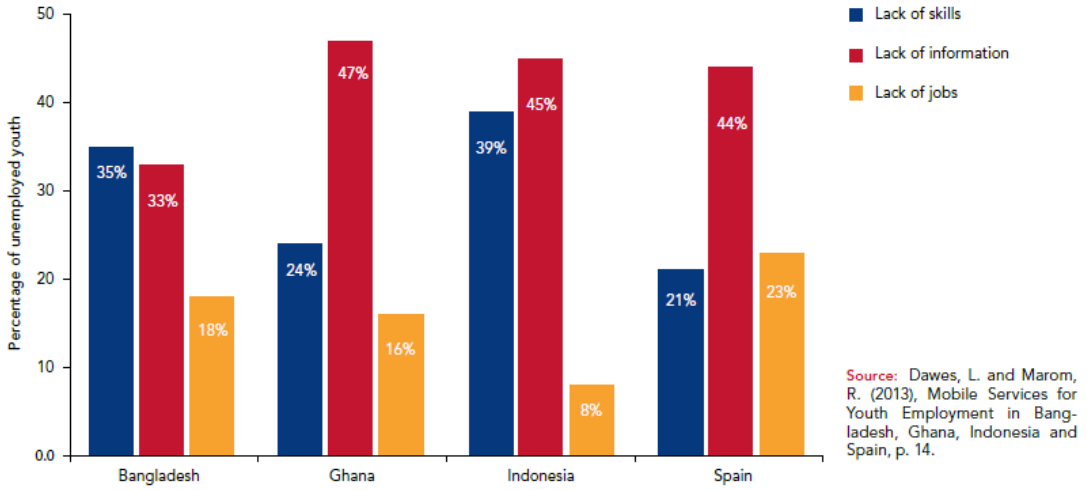
- Informing citizens and giving them an official identity so that individuals can make better decisions for their health, their safety, and education for their children, and can access a variety of publicly and privately provided services;
- Streamlining processes to reduce discretion and opportunities for rent-seeking, ensuring that public resources are collected and spent efficiently, without leakage;
- Receiving feedback from service users to regularly track satisfaction, identify problems, and improve service quality;
- Improving service provider management through better monitoring so that government workers both show up at work and are productive.

2. Governments Can Save Up to 75% with Electronic Payment Programs[xxvii]

Improvements that make government payment programs more efficient, safer and more transparent can cut related administrative costs by as much as 75 percent.

3. E-Government can help deliver employment services to potentially extend its reach to job seekers and other citizens, including the rural poor. As far as e-employment service types are concerned, information services are one of the most important. According to the latest study[xxviii] on youth employment in Bangladesh, Ghana, Indonesia and Spain, lack of skills and information on jobs available are actually perceived as bigger challenges than the lack of available jobs.

Figure 7.5. Youth unemployment in Bangladesh, Ghana, Indonesia and Spain: Job search challenges



Source: Dawes, L. and Marom, R. (2013), Mobile Services for Youth Employment in Bangladesh, Ghana, Indonesia and Spain, p. 14.

In Europe, in the current economic crisis, e-Government policymakers actively expanded and adapted service offerings. The citizen life-event service, 'looking for a job' is currently the service that is used most, with over 70 per cent of users making contact with government online. This is

even higher than 'declaring income taxes' (over 60 per cent), which is a highly popular activity in many countries.

4. The main advantage of an electronic government will be to improve the efficiency of the current system. That would in return save money and time. The introduction would also facilitate better communications between governments and businesses. This will have the advantage of creating an open market and stronger economy. Business and citizens can obtain information at a faster speed and it is possible at any time of the day.

The society is moving toward the mobile connections. The ability of an e-Government service to be accessible to citizens irrespective of location throughout the country brings the next and potentially biggest benefit of an e-Government service. The society is moving toward the mobile connections.

5. e-Government can help forward the reform agenda. When aligned with modernization goals, implementing e-Government can help administrations focus on the additional changes needed to meet service delivery and good governance concerns. At the same time, it provides some valuable reform tools and builds support from high-level leaders and government employees for achieving those objectives[xxix].

Through citizen engagement, e-Government can improve the overall trust relationship between government and public administrations. By improving information flows and encouraging active participation by citizens, e-Government, is increasingly seen as a valuable tool for building trust between governments and citizens.

6. According to EU Government Action Plan 2016-2020: [xxx] Full end-to-end e-procurement can generate savings between 5 to 20%.

7. According to World Bank estimates, opening of data on the level of the European Union would increase the business activity to up to EUR 40 billion per year, and it is estimated that 80% of the overall benefit from open data would be obtained directly by citizens, business sector and the investors.

8. Benefits - The study[xxxi] identified the following key benefits:

- Improved service delivery - 80% of e-Government users rate the improvement in service delivery of significant or moderate social benefit to them
- Reduced consumer costs - 45% of survey respondents stated they had saved money by using e-Government services. 10% of people and 23% of intermediaries reported they saved more than $25 per transaction
- Social benefits - 86% of users felt that the overall benefits of e-Government services was either significant (36%) or moderate (50%)

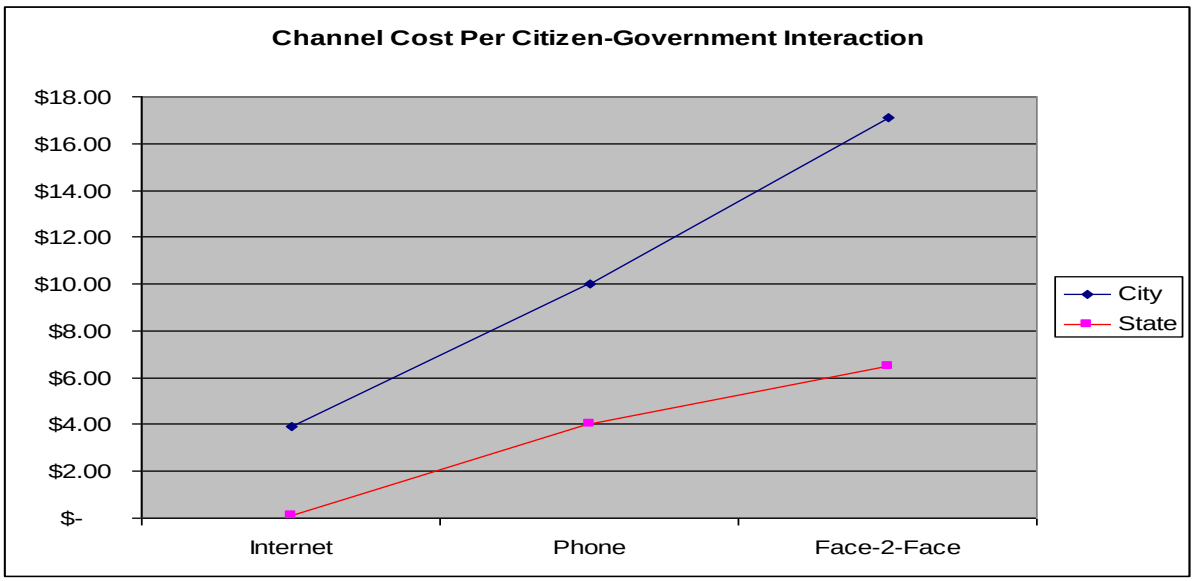
People accessing e-Government services reported:

- 80% –a significant improvement in the ease of finding information
- 75% –improvements in service quality
- 75% –they are better equipped to make better decisions
- 68% –considered their access to public records had improved
- 52% –improvement in business or work opportunities

9. 67 % of agencies expect to reduce costs significantly due to improved business processes

Many agencies are not measuring benefit/cost ratio adequately. Currently, agencies are tracking program costs and there is some evidence of tracking of agency financial benefits. However, fully identifying and assessing the primary sources of value of government online programs, including their social value, will require significant effort.

10. Governments can achieve significant cost savings by moving citizens to self-service on e-Government



Source : Economics of On-line Services in Utah, Center for Public Policy & Administration, University of Utah ; ServiceCanada transaction costs 2012 ; City of Hamilton, Ontario transaction volumes

5 OBJECTIVE METHODOLOGY FOR PRIORITIZATION

Everyone keeps 'to-do' lists. They keep track of the tasks and things they need to do on a daily or weekly basis and cross them off when they are done and add items when they come up. Managing this for yourself or for your family is not too difficult and helps ensure you remember all the things that you need to do. However, it gets much more complicated when trying to manage the to-do list for an entire organization or an entire government. Now you have many more items on your list and whomever put them on the list feels that their item is the most important and should be done next. How does one manage these competing priorities? How is it done objectively comparing everyone's priorities?

There is a standard tool used in Project Management methodology that allows the objective prioritization of various projects based on a common set of criteria. This allows everyone to see exactly why a particular project ends up with a higher priority than another.

Using an objective methodology for prioritizing what projects are done in what order helps ensure that the projects that will provide the most benefit in the shortest timeframe will be done first. It provides a clear, consistent, and transparent process for decision making. It also helps minimize the wasting or inefficient use of resources. Finally, this is a repeatable methodology that can be used to reassess priorities whenever key factors like the economic environment or political situation have changed.

The first and probably the most critical component to this methodology is to establish the rating criteria. What are the factors upon which the potential projects will be evaluated? Typically, these factors include areas such as strategic fit, investment required, technical feasibility, development time, potential impact (measured in money, population, visibility), and complexity. When coming up with the criteria, be sure to keep in mind the various stakeholders and perspectives of the various types of projects you will be comparing against each other.

In order to compare these criteria against each other, it is necessary to assign a weighting factor to each. This should be used as relative importance. If Criterion 1 is considered to be twice as important as Criterion 2, then the weighting factor for 1 will be double the weighting factor as for 2. It is recommended that assigning the weighting factors be done as a group to ensure consensus, since this is the most subjective part of the process. Assigning weighting factors is not an exact formula and you will have to make sure the results are reasonable. It is common to have to make small adjustments to the weighting factors a few times until they work most effectively.

Next it is necessary to establish the criteria rating descriptions. The rating scale we will use is 1 to 5, so a description for each criterion needs to be done. What does a "1" look like, what does a "2" look like, and repeat. This will provide consistent and clear definition on why something is rated a 2 versus a 3 for a particular project. The "5" rating should be the most desirable rating and "1" be the least desirable rating. If we use Cost as an example criterion, then the description for "5" might be 'zero to 10,000 €', while "1" might be "more than one million €".

The penultimate step is to actually rate each project. This can and probably should be done as a team or group with representation from the various stakeholders in the projects being rated. Using the rating descriptions described above, it should be possible to get the entire group to agree on a rating for each project for each criteria.

Finally, when all the ratings are completed, you can sort the project list according to the sum total to see which project is rated highest on down to the lowest. If the totals for two or more projects are too close, another round of review and voting may be called for; or a more detailed analysis of the projects may be necessary.

It is suggested that this prioritization process be performed with no more than 25 total projects and 10 criteria. Using more than the suggested numbers of projects and criteria will end up with many tie scores and be very difficult to manage the rating process. If necessary, the total scope of projects can be broken into sub-categories which can then be individually prioritized. A minimum of 3-4 criteria should be used to give sufficient differentiation between project scores.

Additional details on how to use the tool and the process are included in the attached Excel file, which also contains the prioritization tool itself.

5.1 ILLUSTRATION OF METHODOLOGY AND TOOL

Project Prioritizer

Weight Limits		
Lower Limit	1.00	**Lowest importance**
Upper Limit	10.00	**Highest importance**

		3) Rating Values Description				
		<< Least Desirable		Middle		Most Desirable >>
1) Rating Criteria	2) Weight	1	2	3	4	5
Technical Feasibility	8.00	More than 1 requirement cannot be met	All requirements can be met with additional investment or time or increased project cost	All requirements can be met with additional investment or time	All requirements can be met with additional time	All requirements can be met
Population Served	10.00	Population = 0 > 1000	Population = 1000 > 100,000	Population = 100,000 >500,000	Population = 500,000 > 1 million	Population = 1 million > 2 million
Potential Savings	10.00	0 or 10,000 €	10,000 € to 100,000 €	100,000 € to 500,000€	500,000 € to 1 million €	Greater than 1 million €
Global Ranking improvement	5.00	no change in ranking or negative movement	increase ranking by 1 step	increase ranking by 2-3 steps	increase ranking by 4-5 steps	increase ranking by more than 5 steps
Development Time	6.00	> 1 year	> 9 months and <= 12 months	> 6 months and <= 9 months	> 3 months and <= 6 months	<= 3 months
Development & Implementation Cost	7.00	Greater than 1 million €	500,000 € to 1 million €	100,000 € to 500,000€	10k € to 100,000 €	0 to 10,000 €

Project Prioritizer

Project Priority Calculator

		2) Rating 1 - 5										
Number	1) Project Description	Technical Feasibility	Population Served	Potential Savings	Global Ranking Improvement	Development Time	Development & Implementation Cost	0	0	0	0	**Total** Σ(Weight x Rating)
	Weight	8.00	10.00	10.00	5.00	6.00	7.00	0.00	0.00	0.00	0.00	
1	Establish Central e-Government body	5	5	3	5	4	5					204
2	Establish e-Payment system	3	5	5	4	2	5					191
3	Establish Central e-Procurement portal	4	1	5	3	3	3					146
4	Establish Central Birth Registry	1	5	3	3	2	3					136

5.2 ATTACHED EXCEL-BASED TOOL

Project Prioritizer Tool.xlsm

6 COMMUNICATION AND ADVOCACY PLAN

With any large undertaking, it is necessary to ensure that all involved parties are fully aware of the goals of the initiative, who the other participants are, agree with the plan to achieve the initiative goals, and understand their own role within the initiative. To accomplish this, a communications plan is required.

It should be noted that developing a communications strategy and implementing it is one of NALED's strengths, so there is little that we need to recommend or advise about in this area, but we will make note of several things to bring it to your attention.

One of the primary challenges of the e-Government initiative is that there are so many different stakeholders and their differing viewpoints on what is important or needs to be accomplished. Besides the organizational recommendations that have been made earlier in this paper, it will be necessary to do regular targeted communications to the stakeholders to ensure their acceptance of the initiative, help them understand other stakeholder's point of view and to assist in the mediation of any negotiations that come up during the implementation.

If the central body that is recommended to be formed to drive this initiative truly has representation and input from all the stakeholder constituencies, the communications effort will be made easier as the different groups will be able to hear directly from each other.

Informing and educating the citizen-at-large will also be a key function of the communications plan, as they will provide support and influence on the government's priorities. So the citizenry needs to understand why e-Government is important and beneficial to themselves. The media will play a key role in the process of informing the public about the e-Government initiative and NALED will have to work closely with them as well as their other partners to ensure the key facts and value of the initiative are clearly communicated to the public.

The key audiences that will need to be targeted with communications are: Central Government officials and institutions, local governments, business associations and citizens. Of slightly lesser importance will be the audiences of the international community and NGOs. Some of the key messages that will need to be communicated to these various groups are:

- Central Government officials and institutions: Ensure they understand where they intersect and overlap jurisdiction with other government institutions, understand the needs of both citizens and businesses when shaping the law, understand the need for coordination when writing and implementing new laws
- Local Governments: Municipalities will need to understand the need and value of having some information or services centralized, even if part of the execution is localized, ensure their viewpoint is included when crafting new laws, are aware when changes will affect their local teams
- Business associations: These associations can ensure that the needs of the business community are being met by any new laws or e-services being developed while keeping the input viewed as independent and not perceived as advancing the agenda of any one particular company. These associations can also lend expertise in various areas like technology and finance to the relevant discussions.
- Citizens: As mentioned earlier it will be necessary to inform and educate the public-at-large about the need and benefits of e-Government for the average citizen. They need to understand this initiative is not simply a way for IT companies to win contracts or for the

Government to spend more money or gain more control. Rather, this initiative will increase transparency, make services more efficient and hopefully higher quality, and lower the cost of interacting with the government in terms of time and money. Once they understand these benefits to themselves, they will be able to influence the government to place a high priority on e-Government related projects

The budget for this initiative will have a large effect on what actions can be taken in regards to communications. If project funding can be secured from a donor(s), then a full-fledged communications campaign can take place. If funding is not acquired, then a minimal communications effort will need to be carried out.

7 PROJECT MANAGEMENT METHODOLOGY

In section 5, we discussed a methodology to prioritize e-Government initiatives. The success of large transformational programs is directly dependent on the structure established to manage the transformation in a systematic way. Once a project(s) has been identified for execution, a methodical approach to implementation is required.

In this section, we discuss a structure & a few project management tools to manage implementations. As a separate attachment, a power-point deck of slide templates are provided, to assist the project office in managing transformations.

Four main steps in program management are:

1. Establishing Project Management Office under Central Body
2. Defining success metrics and measurements
3. Setting up a reporting cadence to track progress
4. Communicating status to key project stakeholders (discussed in previous section of paper)

We now discuss the steps in greater detail.
Step 1:

To ensure success of projects the 'preparatory' work at the beginning of the effort is key. It is important to ensure that stakeholders are committed and available. To gain commitment, the roadmap and benefits of executing the project can be used for justification. It is important to secure access to key (non-stakeholder) resources, skills and other information. Clear lines of communication inside the PMO structure, between PMO, central body and steering committee should be established.

Key areas in step 1 are:

a. Setup project execution structure. Identify key stakeholders required to make a project successful.
b. Setup a "roles & expectations" summary for key stakeholders. Stakeholders could be direct participants, observers, influencers, people to be consulted etc.
c. Establish project timeline taking into consideration dependencies and other parallel activities

Role of the project management office:

- Work with the project stakeholders to create, review and approve project plans. Base project identification on outputs of prioritization work
- Establish and manage a weekly cadence with stakeholders
- Create the project timeline and plan
- Define deliverables and clear phase exit criteria for each function and ensure successful execution against the plan.
- Proactively manage & track project risk, dependencies & issues effectively through closure
- Manage project change and communications
- Facilitate regular, standardized project meetings and status reporting to manage project's progress, exceptions & drive issue resolution
- Drive cross-functional solution-building, dependencies & team participation

- Maintain project management tool for project schedule tracking, issue management and ongoing Steering Committee oversight
- Track overall milestone achievements
- Manage project close out
- Publish results & lessons learned

Step 2:

Define success metrics for the project / program. Some examples of Key Performance Indicators (KPIs) are:

- Citizens' satisfaction response to various e-government services like:
  - Ease of finding information
  - Improvements in service quality
  - Improvement in access to public records
  - Improvement in business or work opportunities

- Government Agency (Financial benefits)
  - Reduction in cost of delivery of services (resource efficiencies)
  - Cross-government return on investment through refined business process
  - Reduction in time to process requests through improved business processes
  - Reduction in costs of servicing through advertising, printed material, staff utilization etc.

- Business benefits:
  - Reduction in time to complete government activity
  - Increase in employee productivity as a result of following streamlined processes
  - Reduction in operating, reporting costs due to change in process

Step 3:

An important step to monitor status is to agree upon a cadence to track progress. Several methods can be used to track status but it is key to ensure that project metrics defined at the beginning of the project are continuously validated (and updated if required). A regular frequency of meetings should be secured on calendars to ensure that a consistent pattern of tracking and reporting is established. Project team members should be encouraged to bring issues and risks to the meetings and not just report status as "good". A culture of bringing up problems for awareness and discussion should be encouraged.

Step 4:

Throughout the project timeline, a consistent communication methodology to key stakeholders and the steering committee is important. In the previous section, we have discussed a communications plan that can be adopted by NALED based on its best practices. We suggest that a similar plan be used for communications on e-Government projects by the PMO office.

As a separate attachment, a power-point deck of slide templates are provided, to assist you / project office in managing transformations.

7.1 PROJECT MANAGEMENT TOOLS

Project Management Templ

8 Next Steps

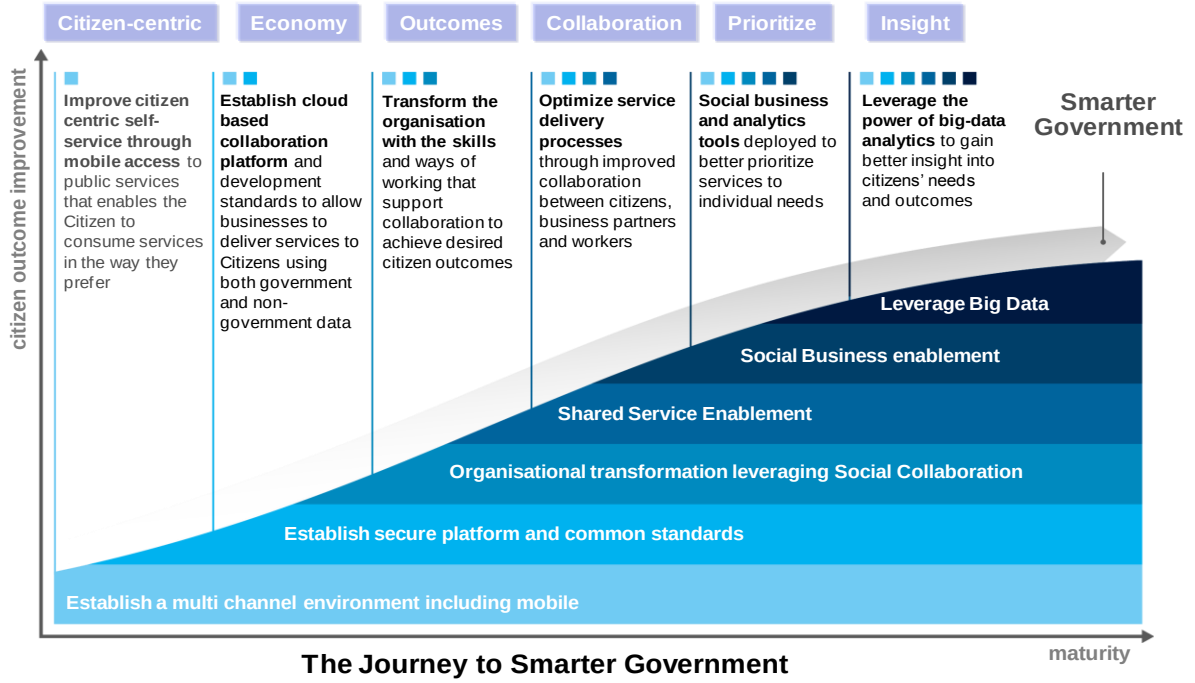
8.1 SUGGESTED ADDITIONAL RESEARCH OR DATA GATHERING ACTIVITIES

We are suggesting the following areas of additional research or data gathering activities to further prepare NALED for leading the advocacy of e-Government.

- Read key reports to gain insights into e-Government topic– UN e-Government Survey 2014: E-Government for the Future We Want, United Nations Public Administration Country Studies; Global competitiveness Report 2015-2016, World Economic Forum; World Development Report 2016: Digital Dividends, A World Bank Group Flagship Report,
- Solicit input from US Embassy IT manager for objective technical advice
- Engage NALED e-Government council to gather priorities from business community
- Facilitate meeting with Treasury, Ministry of Finance and banking industry to discuss e-payment system; banks mentioned they may be willing to help fund a project
- As input to e-Government body, gather inventory of all ICT systems and IT support staff currently in place in government to understand current capacity and need for infrastructure upgrades
- This paper does not address the need to migrate legacy, paper-based, information into new electronic systems. In some cases, it will be possible to have a clear cut-off date, before which no information is available in the electronic system. However, in many cases, it will be necessary and desirable to import some portion of the legacy data into the electronic system to make it truly useful. Therefore it will need to be determined for each process, if, how and how much legacy data will be migrated into the electronic system.

8.2 THE JOURNEY TO SMARTER GOVERNMENT

Government should provide an open digital platform that integrates service delivery across the community



The Journey to Smarter Government

The chart above sets out the key capabilities that the government needs to build on their journey to m-Government – this is useful as it describes the capabilities that need to be built and can be used to assess where agencies are in progressing to m-Government

- **Improved access to information** – implementing web based & telephone client access to services and supporting tools – and building streamlined processes and contact centers to respond to queries
- **Single View of the client** – Gaining a 360 degree view of the client by integrating information across programs, leading to improved information quality, reduced duplication and gaps.
- **Enterprise Case management** – Implementing an enterprise approach to case management so cases can be shared across programs and service providers, with improved functionality and reporting so that service can be improved
- **Integrated approach to fight Fraud, abuse and error** – Using analytics, risk management approaches etc to better target payments to those in need, & reduce improper payments
- **Integrated approach for improved outcomes** – understanding how Agency actions influence client behaviors, optimising the program mix for improved social outcomes
- **Integrated Service delivery** - Gaining the accumulated benefits of the earlier capabilities to optimise outcomes across a wider network, including industry and other government departments.

This is of course a simplification, progress is not necessarily up the staircase in order – and agencies may partly complete a step with a view to completing later. However there is some logic in the sequence, as it is about improving how information is collected, then integrated and in the later steps how this information is used (e.g. through using analytical tools) – greater benefit will be achieved if the data has been improved first.

It is important also to emphasize that this is not just about technology and information. Smarter Social Services is about a change in orientation of the organization – to a more citizen centric model with streamlined operating processes. This will require fundamental change to the organization's operating model – including significant business process redesign, organizational change, changes to physical and IT infrastructure and will need to be supported by training and change management to adapt to the change in cultural behaviors.

9 ACKNOWLEDGEMENTS

The IBM CSC team would like to acknowledge the following who were of great assistance to us during the development of this paper.

- Alan Thurlow – IBM GBS Global Center of Competency for Government, Leader, Government Administration and Mobility – for his expert level advice and input regarding e-Government
- Joe Mendrala and Kosta Andric – Pyxera Global – programmatic and logistical support
- NALED team – the entire NALED organization has been very welcoming and supportive of us during our stay in Belgrade
- IBM CSC Serbia2 team – our IBM colleagues experiencing Serbia with us and providing support throughout the project
- IBM CSC Program team and CSC Alumni – for their wonderful support and encouragement

10 APPENDIX 1: CITATIONS - LIST OF RESEARCH SOURCES

10.1 PUBLICATIONS AND SOURCES FROM NALED AND INTERVIEWEES

1. Strategy for the Development of Electronic Communications in the Republic of Serbia in from 2010 until 2020 (Based on Article 5 Paragraph 1 point 2) of the Law of Electronic Communications ("Official Gazette" No. 44/10) and Article 45 Paragraph 1 Law on Government (Official Gazette no. 55/05, 71/05- correction, 101/07 and 65/08)
2. Development Strategy for Information Society in the Republic of Serbia by 2020 (Pursuant to Article 45, paragraph 1 of the Law on Government (Republic of Serbia Official Gazette, No. 55/05, 71/05-corrigendum, 101/07 and 65/08)
3. REGULATION on Time Stamp Issuing, The Minister of Telecommunications and Information Society, (Pursuant to Article 14, paragraph 3, Article 15, paragraph 5, Article 16, paragraph 3, Article 17, paragraph 2 and Article 18, paragraph 2 of the Electronic Document Law (RS Official Gazette, No. 51/09)
4. Regulation on technical and technological procedures for creating a qualified electronic signature and criteria to be met by devices for creating a qualified electronic signature, the Minister of Telecommunications and Information Society
5. Rulebook on register of certification bodies for qualified electronic certificates' issuing in the republic of Serbia, Minister for Telecommunications and Information Society (Pursuant to Article 19, paragraph 2 of the Law on Electronic Signature (Republic of Serbia Official Gazette, No. 135/04)
6. National Interoperability Framework, Ministry of foreign and domestic trade and telecommunications, Republic of Serbia
7. Electronic Signature Law, JUGOSLOVENSKI PREGLED, Belgrade, 2009
8. Law on electronic documents, general provisions
9. Serbian electronic government development strategy 2015-2018 and the action plan for the implementation of the strategy 2015-2016, Belgrade November 2015
10. NALED Grey Book III - Recommendations for removing administrative obstacles to doing business in Serbia, Belgrade 2010
11. ICT in Serbia, At a glance, 2015, Vojvodina ICT Cluster, www.vojvodinaICTcluster.org
12. Key Results and Activities, NALED 2015/ 2016, X NALED Annual Assembly | Belgrade, 13 April 2016
13. IPA 2010 project 'Supply of ICT equipment and software for Serbian e-Government infrastructure', https://webgate.ec.europa.eu/europeaid/online-services/index.cfm?do=publi.welcome&nbPubliList=15&orderby=upd&orderbyad=Desc&searchtype=RS&aofr=130106
14. IPA 2010 project ' Support to E-Government Development', https://webgate.ec.europa.eu/europeaid/online-services/index.cfm?do=publi.welcome&nbPubliList=15&orderby=upd&orderbyad=Desc&searchtype=RS&aofr=129913
15. Public Administration Reform and IPA 2010 support, http://ec.europa.eu/enlargement/pdf/serbia/ipa/2010/1_par_ipa10.pdf or http://www.europa.rs/upload/documents/documents/IPA/2010/1.%20PAR%20IPA10.pdf
16. IPA 2012 programme on e-business development project website: www.eposlovanje.biz www.eposlovanjesrbija.rs
17. Web site of European Commission's Directorate for Neighbourhood and Enlargement (DG NEAR): http://ec.europa.eu/enlargement/about/directorate-general/index_en.htm
18. Cullen International Consultancy Research Study Papers, http://www.cullen-international.com/asset/?location=/content/assets/research/studies/2011/11/final-report-

4-annex-february-2014.pdf/final-report-4-annex-february-2014.pdf (electronic commerce and e-signatures in Serbia)

19. European Commission's Digital Single Market web page and links on e-Government:
- https://ec.europa.eu/digital-single-market/node/50813
- https://ec.europa.eu/digital-single-market/en/online-trust
- https://ec.europa.eu/digital-single-market/en/public-services-egovernment
- https://ec.europa.eu/digital-single-market/en/cross-border-pilots
- https://ec.europa.eu/digital-single-market/en/open-government
- https://ec.europa.eu/digital-single-market/en/egovernment-studies
- http://ec.europa.eu/idabc/servlets/Doc2bb8.pdf?id=1675

20. The European Digital Progress Report on digital progress in the EU - https://ec.europa.eu/digital-single-market/en
21. The 2016 Digital Scoreboard reports- https://ec.europa.eu/digital-single-market/en/download-scoreboard-reports

10.2 International Publications and Reports

22. General guidelines for the development of government Payment programs, financial infrastructure series the World Bank Report – Aug 2012, http://siteresources.worldbank.org/FINANCIALSECTOR/Resources/General_Guidelines_Govt_Payment_Aug2012.pdf
23. Global competitiveness Report 2015-2016, Insight Report by Klaus Schwab, World Economic Forum, http://www3.weforum.org/docs/gcr/2015-2016/Global_Competitiveness_Report_2015-2016.pdf
24. Benchmarking e-Government: A global perspective, Assessing the Progress of the UN Member States, 2002, https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/English.pdf
25. Estonia The e-Citizen Estonia, A nation-wide project for developing the co-operation between Estonian citizens and the public sector through the Internet, https://e-estonia.com/e-residents/about/
26. UN e-Government Survey 2014: E-Government for the Future We Want, United Nations Public Administration Country Studies, https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2014
27. Doing Business 2016, Measuring regulatory Quality and Efficiency, Economy Profile 2016, Serbia, A World Bank Group Report: http://www.doingbusiness.org/data/exploreeconomies/~/media/giawb/doing%20business/documents/profiles/country/SRB.pdf
28. World Development Report 2016: Digital Dividends, A World Bank Group Flagship Report, http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2016/01/13/090224b08405ea05/2_0/Rendered/PDF/World0developm0000digital0dividends.pdf

11 APPENDIX 2: INTERVIEW AND DISCUSSION PARTICIPANTS

Sector/Group	Group Names	Key Participants / Attendees
Businesses	OSA Engineering	Boris Damjanović
	Societe Generale Srbija	Aleksandar Blagojević, Vuk Kosovac, Ivana Todorović
	Telenor	Marko Carević, Jasmina Vignjević
	VIP mobile	Marko Jović
Business Associations	AmCham Serbia	Milica Samardžić
	Foreign Investors Council (FIC)	Vanja Stanić
Government	Central registry of compulsory social insurance (CROSO)	Damir Čedić, Ivana Milikić
	Customs Administration, ICT Division	Veselin Milošević, Ljiljana Jovanović
	Delivery Unit	Gregor Virant
	Directorate for e-Government	Marija Kujačić, Marija Laganin, Dušan Stojanović
	Ministry of Public Administration & Local Self-Government / Audit Authority Office of EU Funds	Igor Brnabić, Slobodan Karanović, Dražen Maravić
	Ministry of Trade, Tourism and Telecommunications	Tatjana Matić, Irini Reljin, Nebojša Vasiljević
	National Assembly Economic Caucus	Vladimir Marinković
	Public Policy Secretariat	Marko Pešić, Jovana Radibratović
	Serbian Business Registry Agency	Srđan Rogić
Independent	Serbian National Internet Domain Registry	Slobodan Marković
International Community	EU, European Integration and Economic Section	Nataša Čelik, Holst Katharina, Zorica Vasileva
	US Embassy, Belgrade Economic Department	Jonathan Clifton
	USAID BEP (Business Enabling Project)	Tamara Borovčanin, Saša Jelić, Dušan Vasiljević, Aleksandar Zarić
	World Bank	Dusko Vasiljević, Svetlana Vukanović

12 APPENDIX 3: RANKING EXAMPLES AND TABLES

12.1 WORLD ECONOMIC FORUM GLOBAL COMPETITIVENESS INDEX 2016

The Global Competitiveness Index 2015–2016 rankings and 2014–2015 comparisons

	OVERALL INDEX		Basic requirements		Efficiency enhancers		Innovation and sophistication factors	
Country/ Economy	Rank out of 140	Score (1-7)	Rank	Score	Rank	Score	Rank	Score
Serbia	94	3.89	96	4.15	83	3.85	125	3.02
Estonia	30	4.74	21	5.6	28	4.74	31	4.15
Czech Republic	31	4.69	31	5.27	26	4.78	32	4.14
Poland	41	4.49	44	4.91	34	4.68	57	3.7
Russian Federation	45	4.44	47	4.87	40	4.39	76	3.54
Romania	53	4.32	70	4.55	44	4.37	84	3.48
Bulgaria	54	4.32	68	4.57	50	4.37	94	3.48
Slovenia	59	4.28	45	4.9	56	4.21	39	3.99
Macedonia	60	4.28	60	4.85	64	4.11	62	3.62
Hungary	63	4.25	59	4.67	49	4.31	69	3.57
Slovak Republic	67	4.22	56	4.73	47	4.34	59	3.68
Croatia	77	4.07	69	4.56	68	4.05	90	3.43
Moldova	84	4	89	4.28	94	3.76	128	2.93
Tunisia	92	3.93	78	4.43	98	3.65	110	3.26
Kenya	99	3.85	116	3.76	73	3.99	42	3.93
Bosnia and Herzegovina	111	3.71	95	4.15	112	3.48	120	3.05

The Global Competitiveness Index 2015–2016: Basic requirements

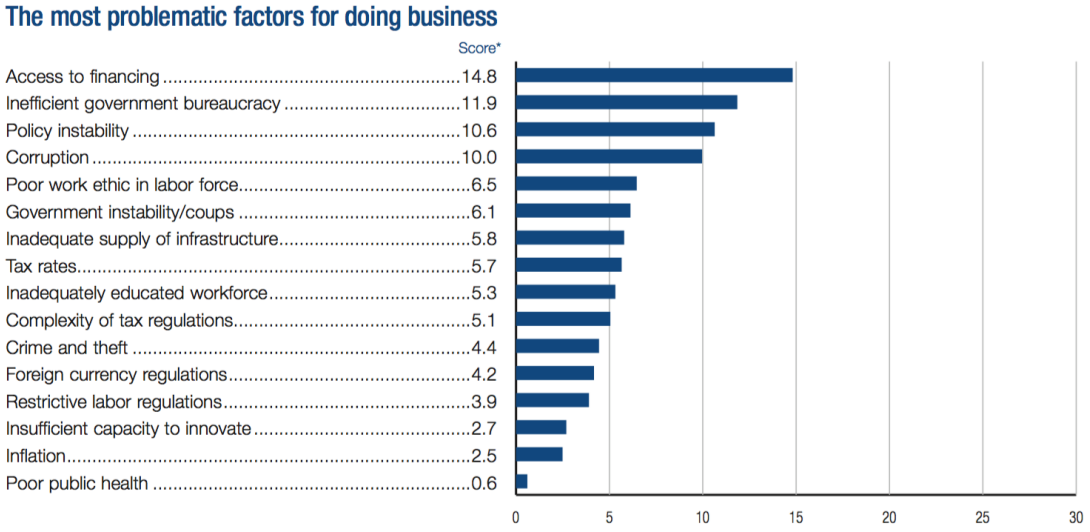
	Basic requirements		1. Institutions		2. Infrastructure		Macroeconomic environme		4. Health and primary education	
Country/ Economy	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Serbia	96	4.15	120	3.24	75	3.87	125	3.6	62	5.87
Estonia	21	5.6	25	5.03	33	4.87	15	6.15	22	6.34
Czech Republic	31	5.27	57	4.09	41	4.7	21	5.97	27	6.31
Poland	44	4.91	58	4.07	56	4.3	46	5.11	40	6.15
Russian Federation	47	4.87	100	3.46	35	4.81	40	5.29	56	5.94
Romania	70	4.55	86	3.66	86	3.61	34	5.44	83	5.49
Bulgaria	68	4.57	107	3.39	72	4	53	4.94	53	5.97
Slovenia	45	4.9	67	3.93	38	4.79	89	4.45	15	6.44
Macedonia	60	4.85	52	4.14	78	3.77	47	5.09	76	5.61
Hungary	59	4.67	97	3.52	48	4.51	52	4.94	72	5.71
Slovak Republic	56	4.73	104	3.43	57	4.28	41	5.21	50	6.01
Croatia	69	4.56	89	3.63	46	4.59	107	4.19	63	5.85
Moldova	89	4.28	123	3.2	83	3.69	55	4.86	91	5.39
Tunisia	78	4.43	79	3.76	80	3.73	97	4.33	58	5.92
Kenya	116	3.76	91	3.61	99	3.22	123	3.63	114	4.6
Bosnia and Herzegovina	95	4.15	127	3.18	103	3.08	98	4.32	48	6.03

The Global Competitiveness Index 2015–2016: Efficiency enhancers

	Efficiency enhancers		5. higher Education and tra		6. Goods Market Efficiency		7. Labour Market eficiency		8. Financial mkt Development		9. Technological Readiness		10. Market Size	
Country/ Economy	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Serbia	83	3.85	71	4.27	127	3.74	118	3.72	120	3.23	51	4.47	75	3.7
Estonia	28	4.74	20	5.5	22	4.93	15	5	23	4.63	32	5.32	98	3.09
Czech Republic	26	4.78	29	5.1	37	4.63	47	4.44	24	4.62	29	5.43	47	4.47
Poland	34	4.68	31	5.05	46	4.51	81	4.11	43	4.26	41	4.78	21	5.16
Russian Federation	40	4.39	38	4.96	92	4.16	50	4.4	95	3.53	60	4.22	6	5.93
Romania	44	4.37	59	4.55	73	4.28	78	4.13	55	4.05	46	4.63	43	4.57
Bulgaria	50	4.37	64	4.48	61	4.35	68	4.23	59	3.98	38	4.87	65	3.91
Slovenia	56	4.21	22	5.41	47	4.5	95	4	128	2.85	35	5.14	85	3.39
Macedonia	64	4.11	46	4.79	33	4.65	84	4.07	52	4.09	63	4.15	108	2.94
Hungary	49	4.31	57	4.56	72	4.29	77	4.15	65	3.93	48	4.6	51	4.32
Slovak Republic	47	4.34	53	4.62	54	4.43	100	3.9	35	4.41	44	4.64	62	4.03
Croatia	68	4.05	51	4.62	105	4.05	105	3.83	88	3.59	43	4.65	79	3.59
Moldova	94	3.76	79	4.09	103	4.06	85	4.07	115	3.28	53	4.39	121	2.68
Tunisia	98	3.65	76	4.12	118	3.92	133	3.33	122	3.11	80	3.57	69	3.87
Kenya	73	3.99	98	3.76	84	4.23	31	4.56	42	4.29	94	3.3	71	3.8
Bosnia and Herzegovina	112	3.48	97	3.77	129	3.69	131	3.36	113	3.34	79	3.6	97	3.13

12.2 World Bank Group Doing Business 2016

Serbia – Major issues for doing business



* From the list of factors, respondents were asked to select the five most problematic for doing business in their country and to rank them between 1 (most problematic) and 5. The score corresponds to the responses weighted according to their rankings.

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12.3 Digital Adoption Index (Governments)

Countries with more accountable governments also adopt more digital technologies
Digital Adoption Index (Governments) ranking by World Bank:
Sources: World Governance Indicators (World Bank, various years) and WDR 2016 team. Data at http://bit.do/WDR2016-Fig5_10.

Country	Digital Adoption Index (Governments)	Regional Rank	WW Rank	Quality of government institutions	Regional Rank	WW Rank
Estonia	0.85999334		6/191	1.0844831		
Latvia	0.78081667			0.70486677		
Romania	0.68031442			0.14378886		
Albania	0.67182446			-0.2253478		
Serbia	0.6534	5/13	44/191	-0.1005	12/13	87/191
Slovakia (Slovak)	0.6432811			0.70535922		
Hungary	0.62523782			0.64918876		
Czech Republic	0.60391116			0.86110002		
Poland	0.60193443			0.83505547		
Croatia	0.52985448			0.43166229		
Slovenia	0.52853447			0.85424274		
Bulgaria	0.47596112			0.12266304		
Macedonia	0.45775113			-0.05494098		
Avg	0.624062662			0.462432422		

12.4 United Nations e-Government Development Index Survey 2014 World e-Government ranking

Comparison of Serbia with Neighboring European Countries

Europe Countries Ranking	Rank	Country	Sub-region	EGDI	Online Service Component	Telecomm. Infrastructure Component	Human Capital Component
1	15	Estonia	Northern Europe	0.8180	0.7717	0.7934	0.8889
2	39	Hungary	Eastern Europe	0.6637	0.5591	0.5654	0.8668
3	41	Slovenia	Southern Europe	0.6505	0.4252	0.6193	0.9072
4	42	Poland	Eastern Europe	0.6482	0.5433	0.5618	0.8396
5	45	Montenegro	Southern Europe	0.6346	0.5276	0.5481	0.8279
6	47	Croatia	Southern Europe	0.6282	0.4646	0.6271	0.7928
7	53	Czech Republic	Eastern Europe	0.6070	0.3701	0.5753	0.8755
8	64	Romania	Eastern Europe	0.5632	0.4409	0.4385	0.8100
9	66	Republic of Moldova	Eastern Europe	0.5571	0.5276	0.4236	0.7201
10	**69**	**Serbia**	**Southern Europe**	**0.5472**	**0.3937**	**0.4681**	**0.7796**
11	73	Bulgaria	Eastern Europe	0.5421	0.2362	0.5941	0.7960
12	84	Albania	Southern Europe	0.5046	0.4488	0.3548	0.7100
13	96	The former Yugoslav Republic of Macedonia	Southern Europe	0.472	0.2441	0.4521	0.7198
14	97	Bosnia and Herzegovina	Southern Europe	0.4707	0.2835	0.3998	0.7288

Ranking Factors/Components

1. Telecommunication Infrastructure
    a. Fixed-broadband subscriptions
    b. Wireless broadband subscriptions
    c. Fixed-telephone subscriptions
    d. Mobile cellular subscriptions
2. Human Capital
    a. Adult literacy
    a. Gross enrolment ratio
    b. Expected years of schooling
    c. Mean years of schooling (MYS)
3. Online Service
    a. The rising importance of a whole-of government approach and integrated online service delivery
    b. The use of e-Government to provide information and services to citizens on environment related issues

c. E-infrastructure and its increasing role in bridging the digital divide, with a particular emphasis on the provision of effective online services for the inclusion of disadvantaged and vulnerable groups, such as the poor, the disabled, women, children and youth, the elderly, minorities, etc.;
d. The increasing emphasis on service usage, multichannel service delivery, 'open government data', e-procurement;
e. The expansion of e-participation and mobile government

12.5 SPAIN: THE CASE OF LONG-TERM E-GOVERNMENT PLANNING

Spain adopted e-Government services for both citizens and businesses. There are 20 basic public services, which were identified by the European Commission and Member States, in the eEurope Initiative of 2000, to measure the take –up by business and citizens of electronically-available public services. The 12 services for citizens as a follows:

12 Services for Citizens	8 Services for Businesses
1. Income taxes: declaration, notification of assessment, 2. Job search services by labour offices 3. Social security benefits 4. Personal documents: passport and driver's licence 5. Car registration (new, used, imported cars) 6. Application for building permission 7. Declaration to the police (e.g. in case of theft) 8. Public libraries (availability of catalogues, search tools) 9. Certificates (birth and marriage): request and delivery 10. Enrolment in higher education/university 11. Announcement of moving (change of address) 12. Health related services (interactive advice on the availability of services in different hospitals; appointments for hospitals)	1. Social contributions for employees 2. Corporate tax: declaration, notification 3. VAT: declaration, notification 4. Registration of a new company 5. Submission of data to statistical offices 6. Customs declarations 7. Environment-related permits (incl. reporting) 8. Public procurement

The inception of Commission for the Reform of Public Administration (CORA), created by Council of Ministers on October 2012, to conduct a comprehensive study of the situation of public administrators in Spain and to propose to the government necessary reforms, paved the way to many e-government initiatives. Succeeding plans were drafted to promote electronic administration. MEJORA Plan (2012-2015) was born to contribute to economic recovery by streamlining administrative processes, the evolution towards global sustainability as saving system, the promotion of inter-integration and cohesion, and the development of e-Government as an element of competitiveness. In the succeeding year, the Council of Ministers adopted the Digital Agenda (2013-2015) to establish Spain's strategy to achieve the objectives of the Digital Agenda for Europe;

maximize the impact of public policy on Information Technology and Communications in order to improve productivity and competitiveness; and transform and modernize the Spanish economy and society through effective and intensive use of technologies by citizens, businesses and administrations.

Source: e-Government in Spain. https://joinup.ec.europa.eu/sites/default/files/egov_in_spain_-_january_2015_-_v_17_0_final.pdf

13 GLOSSARY

- **e-Government** - Electronic government (or e-Government) essentially refers to "The utilization of Information Technology (IT), Information and Communication Technologies (ICT s), and other web-based telecommunication technologies to improve and/or enhance on the efficiency and effectiveness of service delivery in the public sector. e-Government promotes and improves broad stakeholders contribution to national and community development, as well as deepen the governance process.
- **API** – Application Programming Interface. In computer programming, an application programming interface (API) is a set of routines, protocols, and tools for building software and applications.
- **e-Signature** - An electronic signature, or e-signature, is any electronic means that indicates either that a person adopts the contents of an electronic message, or more broadly that the person who claims to have written a message is the one who wrote it (and that the message received is the one that was sent by this person). By comparison, a signature is a stylized script associated with a person. In commerce and the law, a signature on a document is an indication that the person adopts the intentions recorded in the document. Both are comparable to a seal.
- **e-Business** - Electronic business, or e-business, is the application of information and communication technologies (ICT) in support of all the activities of business. Commerce constitutes the exchange of products and services between businesses, groups and individuals and can be seen as one of the essential activities of any business. Electronic commerce focuses on the use of ICT to enable the external activities and relationships of the business with individuals, groups and other businesses or e business refers to business with help of internet i.e. doing business with the help of internet network.
- **e-Service:** The concept of E-service (short for electronic service), represents one prominent application of utilizing the use of Information and communication technologies (ICTs) in different areas of central portal
- **Open Data -** Open data is the idea that some data should be freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control. The goals of the open data movement are similar to those of other "open" movements such as open source, open hardware, open content, and open access. The philosophy behind open data has been long established, but the term "open data" itself is recent, gaining popularity with the rise of the Internet and World Wide Web and, especially, with the launch of open-data government initiatives such as Data.gov and Data.gov.uk.
- **System of Record** - A system of record (SOR) or Source System of Record (SSoR) is Data Management term for an information storage system (commonly implemented on a computer system) that is the authoritative data source for a given data element or piece of information. The need to identify systems of record can become acute in organizations where management information systems have been built by taking output data from multiple source systems, re-processing this data, and then re-presenting the result for a new business use.
- **System of Engagement –** Systems of engagement are decentralized IT components that incorporate technologies such as social media and the cloud to encourage and enable peer interaction. A system of engagement differs from a system of record, an information storage and retrieval system that provides a centralized, authoritative source of data elements in an IT environment containing multiple points of data generation

- **Business-to-Government Payments:** payments made by businesses to the government, normally in connection with taxes, duties or the payment for goods or services provided by the government.
- **Government-to-Business payments**: Payments made from the government to businesses, normally in association with procurement of goods and services, expenses of public sector officers, tax refunds, etc.
- **Person-to-government Payments:** payments made by individuals to the government, normally in connection with taxes, duties or the payment for goods and services provided by the government.
- **Government-to-Person payments**: Payments made from the government to individuals. e most common types of G2P payments are the payment of salaries for public sector employees, the disbursement of subsidies and similar cash-transfer programs.
- **Centralized Treasury System:** an operational model by which the processes related to government payments and collections are handled in a centralized manner, typically by the national treasury. e centralized system normally comprises the national government, and in some cases also one or more levels of sub-national governments.
- **Electronic Money**: value stored electronically in a device such as a chip card or a hard drive in a personal computer.
- **Interoperability:** interoperability is the ability of different information technology systems and software applications to communicate, exchange data, and use the information that has been exchanged.
- **e-Archiving** - The electronic archiving are simply records management process that ensures protection, maintenance and accessibility and begin from the moment of creating the document and ending with destroyed or legacy is preserved forever, not only in volume or scanning. Log Record can be defined as information that is recorded and maintained and managed by the person or body or establishment either for legal purposes or for its value for business.

14 ENDNOTES

[i] http://www.seio.gov.rs/upload/documents/eu_dokumenta/godisnji_izvestaji_ek_o_napretku/izvestaj_o_napretku_14.pdf

[ii] European Union e-government Action Plan 2016-2020; https://ec.europa.eu/digital-single-market/en/news/communication-eu-egovernment-action-plan-2016-2020-accelerating-digital-transformation

[iii] http://www.worldbank.org/en/topic/ict/brief/e-gov-resources#egov

[iv] Deloitte report

[v] World Trade Organization, *e-commerce in developing countries*, 2013

[vi] *United Nations E-Government Survey 2014: E-Government for the Future We Want; http://www.unpan.org/e-government*

[vii] WEF (2015). The Global Competitiveness Report 2015–2016. A report published by World Economic Forum, Geneva, 2015.

[viii] Global competitiveness improvement: Egovernment as a tool, Dr. Emad Abu-Shanab, Yarmouk University, May 2016, https://www.researchgate.net/publication/303293002

[ix] *United Nations Development Programme, Open Data Readiness Assessment, Republic of Serbia; http://www.rs.undp.org/*

[x] World Bank. 2016. Doing Business 2016: Measuring Regulatory Quality and Efficiency. Washington, DC: World Bank Group. DOI: 10.1596/978-1-4648-0667-4. License: Creative Commons Attribution CC BY 3.0 IGO

[xi] World Bank. 2016. Doing Business 2016: Measuring Regulatory Quality and Efficiency. Washington, DC: World Bank Group. DOI: 10.1596/978-1-4648-0667-4. License: Creative Commons Attribution CC BY 3.0 IGO

[xii] World Bank. 2016. *World Development Report 2016: Digital Dividends.* Washington, DC: World Bank. doi:10.1596/978-1-4648-0671-1. License: Creative Commons Attribution CC BY 3.0 IGO

[xiii] See the Information System Authority's website at https://www.ria.ee/x-road/

[xiv] https://www.riigiteataja.ee/en/eli/522122014002/consolide.

[xv] *United Nations E-Government Survey 2014: E-Government for the Future We Want; http://www.unpan.org/e-government*

[xvi] the Importance of Interoperability for eGovernment Services – EU commission staff working paper

[xvii] the Importance of Interoperability for eGovernment Services – EU commission staff working paper

[xviii] *United Nations E-Government Survey 2014: E-Government for the Future We Want; http://www.unpan.org/e-government (pp.7 and 8)*

[xix] *Open Data Framework, Digital Single Market*

[xx] *United Nations Development Programme, Open Data Readiness Assessment, Republic of Serbia; http://www.rs.undp.org/*

[xxi] State Service Commission, Government of New Zealand. 2006. *Guidance on Multi-factor Authentication*.

[xxii] S. Chandler, and S. Emanuels. 2002. *Transformation not Automation*. Proceedings of 2nd European Conference on E-Government, pp. 91-102

[xxiii] http://www.openideurope.eu/2008/03/04/openid-net-id-2008-basel-switzerland/

[xxiv] World Bank. 2012, General Guidelines for the Development of Government Payment Programs

[xxv] World Bank Recommendation for e-Procurement

[xxvi] World Bank. 2016. *World Development Report 2016: Digital Dividends.* Washington, DC: World Bank. doi:10.1596/978-1-4648-0671-1. License: Creative Commons Attribution CC BY 3.0 IGO

[xxvii] http://www.worldbank.org/en/news/press-release/2012/08/02/governments-can-save-up-seventy-five-percent-with-electronic-payment-programs

[xxviii] *United Nations E-Government Survey 2014: E-Government for the Future We Want; http://www.unpan.org/e-government*

[xxix] http://www.we-gov.org/page_ACeS44 05/26/16

[xxx] European Union e-government Action Plan 2016-2020; https://ec.europa.eu/digital-single-market/en/news/communication-eu-egovernment-action-plan-2016-2020-accelerating-digital-transformation

[xxxi] E-Government Benefits Study - Commonwealth of Australia 2003; https://www.finance.gov.au/agimo-archive/__data/assets/file/0012/16032/benefits.pdf