

St. Vincent and the Grenadines
E-Government System Development Planning
and Consultancy Services

St. Vincent and the Grenadines
E-Government Development
Strategy Plan (V1.01)

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1. Foreword

1.1 E-Government Development Background

1.1.1 Definition of e-Government

As the global ICT and internet develops rapidly, e-Government services have already become an essential for national competitiveness increasing. E-Government now is not only a tool for government efficient enhancement but also a process for government services transformation. In the past 10 years, the United Nations published global e-Government survey every 1 or 2 years. From 2002 to 2012, United Nations totally published 7 e-Government survey reports. According to that, e-Government is not just to implement an ICT project. It is a permanent commitment by government to improve the relationship between private citizens and the public sector through enhanced, cost-effective and efficient delivery of services, information and knowledge.

The definition of E-Government is “utilizing the internet and the world-wide-web for delivering government information and services to citizens”. (*From the Benchmarking E-government: A Global Perspective, United Nations – DPEPA, 2002*) The implied meaning of “e” is “on-line” or any other ICT technologies and these technologies help government to offer information and services through Internet or other channels. It also means citizens can acquire government information, submit government service application or pay government fees on-line. E-Government is also aimed to offer services to citizen at any time and any place. That is, citizens can use multiple devices to access government information and services without the restrictions of time and location. In e-Government services, citizens can use Internet instead of physical transportation and they don’t need to go to government service counter any more.

1.1.2 Government Development in the World

E-Government development has become an important issue in the world. Most of countries have recognized the importance of e-Government to business, society and citizen. And invest a lot of resources to improve network infrastructure, to enlarge on line service, and base on the citizen-centric concept to offer customer oriented services.

Refer to the e-Government development history of advanced countries, all of each country start e-Government development from network infrastructure construction. And then to engage in the implementation, deepen, and integration of e-services. After the e-services are mature, the focal point is to enhance the operation efficiency and service quality. Finally, use e-government services to promote national development and competitiveness increasing. The e-Government development steps are as following:



1. Infrastructure: After e-Government development for many years, Most of countries had a mature environment in infrastructure such as network construction, Internet access etc. The current focuses of e-Government infrastructure development in most of countries are identification, information security. Many countries in Europe emphasize the importance of electronic identification. Other countries like USA, Korea focus on the information infrastructure which can ensure information security.
2. The implementation, deepening and integration of services: In order to enhance resources utilization, to promote process integration, services standardization; to develop share services, one stop services; and to increase the diversity and generality of services is the direction of e-Government on-line services development.
3. Operation efficiency and Quality services: Use secure and reliable data processing and standard information interface to promote data exchange and utilization in public sector. To simplify administration process and to increase operation efficiency. Base on the citizen centric concept to offer proactive, interactive services. Then to increase service quality and satisfaction.
4. National competitiveness: e-Government development should be aligned with national policy to increase national competitive advantage, for example, to foster ICT industry, to enhance information manpower capacity, to strengthen international collaboration, to shrink digital divide etc.

1.1.3 The Service Type of e-Government

E-Government development can enhance the service quality to users, including citizens, business, and government agencies. According different type clients, they are 3 majors services type of e-Government:

- Government to citizen (G2C)
- Government to business (G2B)
- Government to government (G2G)

The represented e-Government services in different type are as following:

G2C:

1. E-Tax

Citizens can calculate, file and pay their tax through the Internet.

2. E-Vehicle administration

Citizens can update, renew their driver's license online.

G2B:

1. E-Procurement

Government tenders can be opened to public. Business can download tenders information, submit proposal, and bid online.

2. Enterprise Registration

Business can process the enterprise registration. Government tenders can be opened to public. Business can download tenders information, submit proposal, and bid online.

G2G:

1. E-Official document and archiving

Online official document producing, processing, exchanging and archiving

2. Human resource management system

3. Budget and accounting system

4. Project management system

5. e-Form system

1.2 E-Government Development in SVG

1.2.1 SVG's Pursuit of e-Government Development

In 2001, the Government of St. Vincent and the Grenadines developed its first National and Strategy Action Plan 2002-2007. One of the major emphases of the plan was to promote the economic with the use of Information communication technology. SVG was then proactively pursuing ICT establishment and e-government development. In the same year, a new Ministry for Telecommunications, Science, Technology and Innovation was formed, and Information Communication and Technology Advisory Council were appointed as the lead advisory agency in ICT development related affairs.

In 2002, the regulatory framework was changed to open up the telecommunication industry. Consequently, domestic competition grows; price fell and started to become more affordable than ever. Also in the same year, in light of the lack in formal legal framework governing the e-commerce within SVG and across the region, SVG had put in efforts to collaborate with OECS to realize a significant comparative advantage for the region.

During the time frame of 2002-2007, the launch of e-government was successful and ongoing. Some e-government initiatives were funded individually by EU, World Bank, and Government of Taiwan, and areas of the initiatives include E-GRIP Projects, E-Inclusion, Agriculture, Health, Education, Land, Business, and Labor.

1.2.2 ICT Cooperation Agreement & Subject Expert Team's Onsite Visit

In November 2010, an ICT cooperation agreement was signed by the governments of St. Vincent and the Grenadines and the Republic of China (Taiwan), which aims at strengthening the ICT area by capitalizing on Taiwan's advanced ICT ability and e-government experiences.

Before two governments sign the agreement, ICDF had formed a subject expert team to visit SVG to understand the information infrastructure, the progress on pursuit of e-governance, and SVG's priorities on e-government initiatives. Team members include subject experts in the areas, such as e-government regulatory framework, e-government development planning, and network infrastructure.

In the summary of the ICT cooperation assessment report, the expert team made the following suggestion: Short term projects may include the development of National Portal, Civil Registry System interfacing with JEMS, Hospital Information System for Milton Cato Memorial Hospital, and ICT Center establishment. In the long term, the efforts should be focused on the establishment of the ICT

infrastructure and Network Optimization.

1.2.3 IISI Consultancy Team e-Government Consulting Service

In 2011, ICDF announced a tender to the public to invite well-established companies experienced in e-government field to provide consultancy service to the SVG and ICDF. The project goals are to

1. Plan and propose to SVG the e-Gov strategy, key items, and priorities for 2012~2016
2. Plan and propose to SVG the GSN strategy, priorities, and key components of communication infrastructure
3. Compose RFPs for Government Portal and Crime Management System, or two other suitable systems
4. Conduct feasibility analysis for both e-Registry system and e-Doc system, and propose a development strategy
5. Perform at least 10 e-Government education and promotion workshops.

IISI had won the contract and began its service in early 2012. In February IISI consultant team conducted e-government surveys through interviews with the government agents, and held 10 educational workshops to present the e-Gov status report and successful systems launched in Taiwan government. The preliminary suggestions made to SVG in regard to e-government systems include (1) Enhance National Portal and rebuild Intranet Portal functions in the National Portal and (2) Document Archive System development. The e-Government Strategic Plan and Development Plan for Government Service Platform will be provided by the end of the project, which is currently scheduled around middle May 2012.

2. E-Government Global Trends

2.1 E-Government development directions in major countries

2.1.1 USA

USA emphasizes that "government needs to reform its operations - how it goes about its business and how it treats the people it serves." There are three principles in e-Government development:

1. Citizen-centered, not bureaucracy-centered;
2. Results-oriented; and
3. Market-based, actively promoting innovation.

Besides, in order to transform a more efficiency and more effective government. USA announced 25 information management re-engineering implementation plans for operation efficiency and large project management performance purposes. The focal points include:

- Cloud concept in e-Government development
- Federal ICT centers consolidation
- Fundamental infrastructure and services

2.1.2 European Union

1. European governments are recognized for being open, flexible and collaborative in their relations with citizens and businesses.
2. They use e-Government to increase their efficiency and effectiveness and to constantly improve public services in a way that caters for users ' different needs and maximizes public value, thus supporting the transition of Europe to a leading knowledge-based economy.

2.1.3 Singapore

1. To be a Collaborative Government that to enhance interactive and collaborative between government and citizen, business.
2. Joint development for the most value pursuing, common services development, on-line services quality improving.
3. To hasten the reworking of backend processes that cut across agencies to strengthen customer-centricity in service delivery.
4. Shift the focus from front-end to backend integration, and to advance from integrating services to integrating government.
5. To enhance to communication with citizen. Promote public consultation exercise to

2.1.4 Korea

1. Integration of e-Government systems for seamless delivery of public services
2. Customer-centric citizen services and enhanced public participation
3. Intelligent administrative services through digital government network
4. Real-time public safety information network
5. Strengthened e-Government infrastructure through enhanced privacy and security.

2.1.5 Australia

Effective use of technology to transform government into a more efficient and client oriented sector of the economy.

1. Meeting Users' Needs
2. Connected Service Delivery
3. Value for Money
4. Public Sector Capability

2.1.6 Taiwan

Provide service beyond the boundary. Quality above the living standard

1. Application: Provide citizen-centric service
2. Device: Multiple service channels
3. Network: Network circumstances

2.2 E-Government Common Trends

According to the e-Government development of major countries, the e-Government common trends are as following:

2.2.1 Online Service Delivery

To realize the full benefits of e-government, online service plays a very important role. Through the online service, citizens may obtain static information such as documents on laws, policies etc., across sectors of education, health, finance, social welfare, and labor; they may use public services such as tax submission, fine payment, and license application. They may influence the public policy via e-participation information and services; they may obtain information through the use of technical features, such as audio, video, and RSS.

Online public services remain the top priority of many nations since the online presence of the public services can significant lower the service costs. For example, as for the income tax submission, the traditional paper submission may

contain several components of task, such as submission management, form validation, monetary transaction, notification etc. The employment of the technology can remarkably cut the administrative efforts and labors.

According to the UN e-Government Survey 2012, in terms of the sectors, Finance tops the list, with 179 countries out of 190 providing archived information, followed by Education (164) and Health (156) accordingly. The environment sector is at the bottom of the list, with only 147 countries providing the archived information.

In terms of online transactional service, income tax submission ranks No. 1, with 77 countries out of 190 providing the service, followed by utilities and fines. The ID card and driver's license are provided by the fewest countries, with only 34 among 190.

2.2.2 Online Service Integration & Citizen-Centric Design

An ultimate goal in e-government is to provide citizens with “one-stop shop”, so that they may easily access the online services they need through single entry point, that is, the national portal. To reach this goal, one of the biggest challenges is that the organizational structure of the government is usually formed according to nature and scope of the service, and many of the issues are not easy to be classified under a specific category from the viewpoint of citizens. It will be imperative to arrange the services in a citizen centric way. That is, the portal should provide a user friendly interface that is “citizen-centric”, easy to navigate, as opposed to “agency-centric” – an interface that requires very little knowledge about the organizational structure of government, but nature of the matter itself.

2.2.3 E-Participation

E-Participation also becomes a growing area among both developed countries and developing countries. The traditional role of government as a controller of information and services has shifted to a proactive facilitator. Then in this context, any policy formation is no longer at the government side only. Rather, it becomes a two-way, interactive process, where citizens' views are thoroughly considered, and government's transparency and efficiency are significantly improved.

A survey on Depth of e-Participation of the UN member states shows the majority of countries offer less than two thirds of all e-participation services assessed; more than one third of all countries do not offer any e-participation services.

2.2.4 Public Sector Interoperability

Each agency will usually have its own system that handles its service area.

When the services provided by the government are growing tremendously in number and in complexity, it is very important to enable all the systems to exchange information seamlessly. The UN e-Government Survey uses two indicators to assess the public sector interoperability: Electronic Identity Management and Online Tracking System. The survey result shows that only 27% of the member states have Electronic Identity Management, and only 34% of the member states have Online Tracking System.

2.2.5 Multichannel Service Delivery

In order to maximize the benefit of the society as a whole, the multichannel service delivery provides service access points to the different demographics. The people in different groups would have different preferred service channel, so the coordination of the channel is important. For example, a group of people might prefer using web as service channel, while another group is choosing mobile devices to access public services. Then, in this context, agencies will need to ensure information delivery, transactions across channels, and the messages delivered in all channels are unified and consistent. Otherwise, it might happen, for example, that in mobile channel, certain services are not available, or content is different and lacking in some way, this channel may be abandoned by users eventually. Also, governments need to respond to new technologies or trends faster. Otherwise, the rate of channel acceptance will not be at a satisfactory level.

When planning a new service delivery channel, the responsible agencies need to be able to assess the new channel to be implemented, weighing the required resources against the potential benefits. And one of the most important issues is not to let any of the vulnerable groups left out, for they are the people who need the public services most.

After a new channel is launched, governments will need to make marketing efforts to raise the public awareness about the new cost-effective option they have, or even need to persuade certain groups to adopt the new way because the rationale sometimes might not be as straightforward. Only when the public can clearly see the benefit of the new channel can the initiative become successful.

2.2.6 Bridging Digital Gap

To eliminate the digital inequality in societies, governments need to look into different demographics to remove the barriers that hinder the groups from accessing needed resources online. The dimensions may include language,

literacy, ability, capability, gender, income, location, and age. For any vulnerable group in any dimension, governments need to find out that particular barriers and corresponding solutions. If the barriers are not to be removed in a short timeframe, at minimum governments should make sure that those groups still receive the services via traditional channels, as opposed to online systems.

3. Current State Assessment

3.1 The United Nations World e-Government Rankings 2012

In this section, we will look into the e-government rankings of SVG, in overall e-government development ranking and its components as well. The ranking tables are excerpted from the United Nations e-Government Survey.

3.1.1 Overall E-government development index ranking

The below table is the e-government development index ranking for SVG 2010 and 2012.

Year	Rank	Index value	Of which		
			Online service component	Telecommunication infrastructure component	Human capital component
2012	85	0.5177	0.3137	0.4697	0.7696
2010	94	0.4355	0.1329	0.3648	0.8091

There are 193 member states included in the survey 2012, compared to 191 in survey 2010. SVG has gone up to No. 94 from No.85. With two member states added in the survey 2012, we see that SVG still moves up 9 places in the e-government development ranking. Therefore, relatively speaking, the overall e-government development of SVG has progressed noticeably.

However, due to the newly implemented Z-score normalization before normalization process of each component value, the figures of 3 components 2012 presented above cannot be directly compared with the numbers of 2010.

3.1.2 Online service index

The below table is the online service index ranking for SVG 2010 and 2012.

Year	Rank	Index value	Points for emerging information services	Points for enhanced information services	Points for transaction services	Points for connected approach
2012	126	0.3137	75%	38%	13%	23%
2010	139	0.1302	29	11	0	1

With two member states added in the survey 2012, we see that SVG still moves up 13 places in the online service ranking. Therefore, relatively speaking, the online service of SVG has progressed noticeably.

Nonetheless, the information of how to convert the figures of 2010 to figures of 2012, or vice versa, is not found in the survey of 2012. So no conclusion for progress of each stage can be drawn at this time.

3.1.3 Telecommunication infrastructure index

The below table is the telecommunication infrastructure index ranking for SVG 2010 and 2012.

Year	Rank	Index value	Estimated Internet users per 100 inhabitants	Main fixed telephone lines per 100 inhabitants	Mobile subscribers per 100 inhabitants	Fixed internet subscriptions per 100 inhabitants	Total fixed broadband per 100 inhabitants
2012	52	0.4697	69.59	19.85	120.54	*11.68	11.43
Year	Rank	Index value	Estimated Internet users per 100 inhabitants	Main fixed telephone lines per 100 inhabitants	Mobile subscribers per 100 inhabitants	Personal computers per 100 inhabitants	Total fixed broadband per 100 inhabitants
2010	48	0.3685	60.49	20.87	119.23	15.18	8.58

With two member states added in the survey 2012, we see that the SVG drops 13 places in the telecommunication infrastructure ranking. Therefore, compared to other countries, the telecommunication infrastructure of SVG has not progressed very well in the past two years.

Telecommunication infrastructure index can be further broken down into five components: “Estimated Internet users per 100 inhabitants”, “Main fixed telephone lines per 100 inhabitants”, “Mobile subscribers per 100 inhabitants”, “Fixed internet subscriptions per 100 inhabitants”, and “Total fixed broadband per 100 inhabitants”.

1. Estimated Internet users per 100 inhabitants: The number of 2012 has significantly increased from 60.49 to 69.59.

2. Main fixed telephone lines per 100 inhabitants: The number of 2012 has dropped from 19.85 to 20.87. This might be due to the fact that mobile devices have played a very crucial role today and small family may choose to use their mobile phone and not to install a fixed line.
3. Mobile subscribers per 100 inhabitants: The number of 2012 has significantly increased from 119.23 to 120.54.
4. Fixed internet subscriptions per 100 inhabitants: The number of 2012 is 11.68. However, the component in survey 2010 was “Personal computers per 100 inhabitants”, and its number is 15.18. Therefore, the slight drop of overall telecommunication infrastructure index could be attributed to the change of this component.
5. Total fixed broadband per 100 inhabitants: The number of 2012 has significantly increased from 11.43 to 8.58.

3.1.4 Human capital index

The below table is the human capital index ranking for SVG 2010 and 2012.

Year	Rank	Index value	Adult literacy rate (%)	Combined gross enrolment ratio for primary, secondary and tertiary schools (%)
2012	108	0.7696	88.1	78.38
2010	111	0.8172	88.1	68.95

With two member states added in the survey 2012, we see that SVG still moves up 3 places in the human capital ranking. Therefore, relatively speaking, the human capital of SVG has somewhat progressed.

Human capital index can be further broken down into two components: “Adult literacy rate”, and “Combined gross enrolment ratio for primary, secondary and tertiary schools”.

1. Adult literacy rate: The number has stayed the same from 2010 to 2012, at 88.1%.
2. Combined gross enrolment ratio for primary, secondary and tertiary schools: The number of 2012 has significantly increased from 68.95 to 78.38. This is the main reason the overall human capital index can climb up.

3.1.5 E-participation index

The below table is the human capital index ranking for SVG 2010 and 2012.

Year	Rank	Index value
2012	28	0.1053
2010	157	0.0143

We see that SVG moves up 129 places in the e-participation ranking. Therefore, relatively speaking, the e-participation of SVG has remarkably improved. The index details and components, however, cannot be found in the survey 2012. Therefore, no conclusion can be drawn from the numbers at the moment.

3.2 SVG e-Government Projects

Information communication technology is a very important approach to assist a country to become a Modern, Competitive one. SVG had announced the report of Information and Communication Technology Strategy and Action Plan 2010- 2015 in Set. 2009. In this report, there are 65 strategic plans and 129 work items.

The report mentions “The e-Government Program aims to provide a shared technology infrastructure that is stable and secure and which embraces a set of policies and standards for the connection to and use of this shared infrastructure.” “e-Government platform will enable G2G, C2G and B2G connectivity.” e-Government will provide services such as:

- Domain management
- Security and intrusion protection
- Virtual private networks
- Firewalls
- Physical connectivity between government locations.

The shared infrastructure will enable the provision and management of shared services such as:

- email
- Internet

- Intranet
- Voice over IP
- Co-location of servers
- Application hosting
- SAN facilities

And the challenge will be for the government of SVG to re-organize itself to take advantage of the enabling technology to improve its business processes and its service delivery model to its businesses and citizens.”

This report also mentions the major directions of e-Government include:

1. Communication backbone
2. Standards and policies
3. Portal
4. Government on-line
5. Process redesign

And the strategies of e-Government related in this report include:

1. Require that all appropriate government information be put on-line within a reasonable timeframe through a single government electronic portal
 - New Government Portal Established
 - Appropriate government information placed on line based on Freedom of Information and Privacy Acts
2. Encourage and support the provision of government services through electronic channels that are appropriate and cost-effective and can improve revenue collection
 - ASYCUDA World Customs clearance system
 - ICT Tax Filing implemented
 - On line searches for Business names implemented
 - Delivery of substantial number of other revenue and cost effective government services on line
3. Deploy E-Government initiatives to improve efficiency.
 - Expansion of the Government Intranet
 - Computerization of BRAGSA and public works

- Computerization of the Postal System
 - Deployment of an ICT Land Registry
 - Computerization of CIPO (start business on line)
4. Develop and implement a policy framework to support and enable shared services within government, including the government backbone, email, Internet, VOIP and SANs.
 - Cabinet mandates the deployment of services sharing the Government Backbone
 5. Facilitate the policy and governance framework to enable integrated service delivery across government.
 - Fully participate and provide leadership in OECS e-GRIP Project
 - Ensure total cost of ownership for software
 - Establish Sub-Regional and National Technical team
 6. Expand and strengthen the policy and standards framework utilized within government.
 - Implement common equipment and software standards as well as enhance public servants & citizens aware
 - Announce the publication of the usage of equipment, ICT and Internet as well as the occasions of misuse and abuse of the policy
 7. Support the use of ICT to improve national security and the administration of justice in the country.
 - Complete Police Information and fingerprint ICT
 - Pay-Phones and security Web-Cams along every mile of highway, beaches and tourism sites deploy along with other CCTV initiatives.
 - GMDSS Project for Yacht Security and Fisher folk deployed
 8. Enhance the security of ICT users by implementing a Certificate Authority.
 9. Implement a human resource management information system across government.
 10. Cooperation with Taiwan (Taiwan ICT Centre)

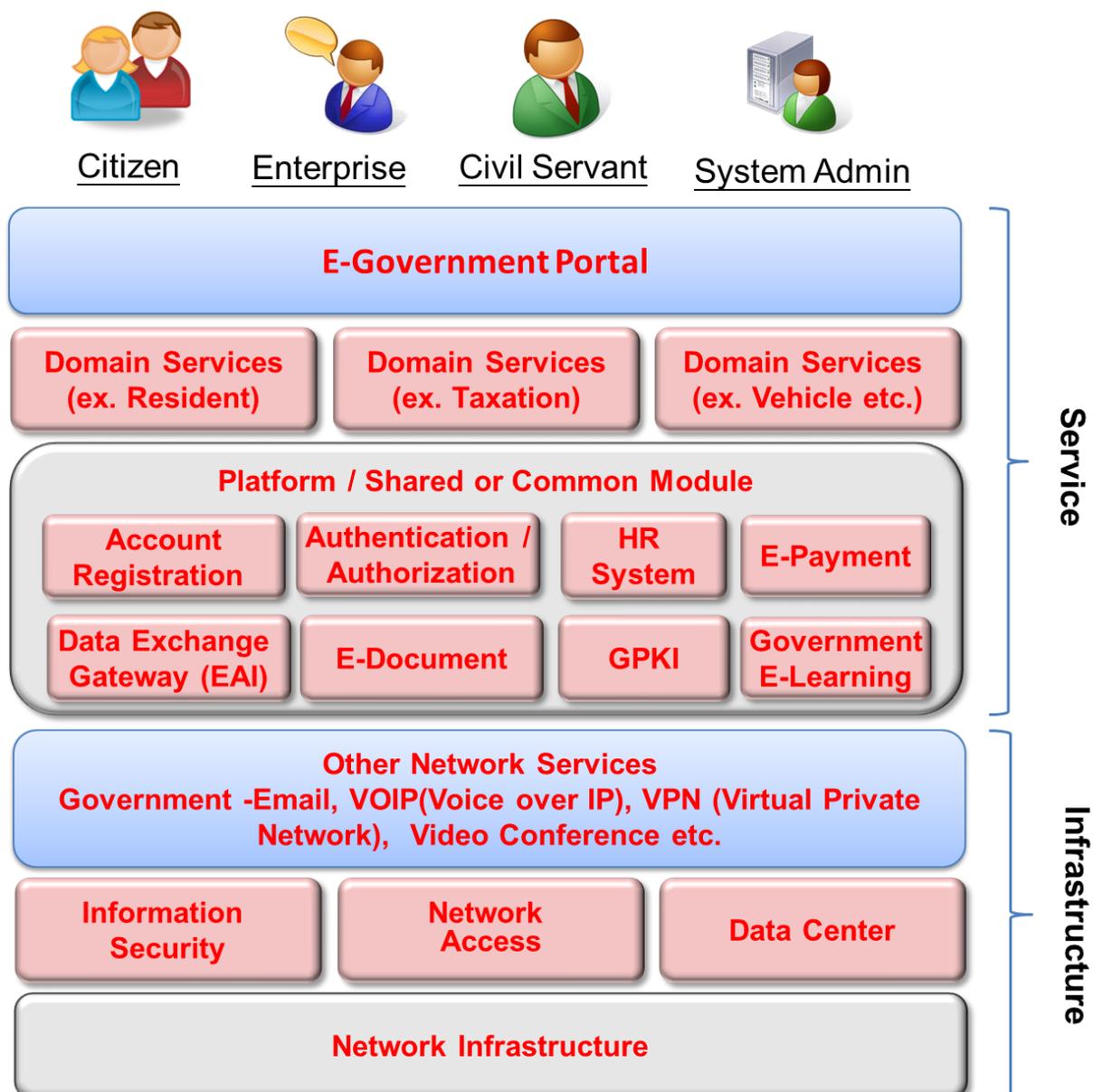
3.3 Future e-Government Development Directions for SVG

According to the e-Government global trends and the current e-Government state assessment of SVG. There are 4 dimensions for future directions of e-Government development in SVG:

- Services (Application): Government portal, civil registration, Land administration, Tax, Government document, Government procurement etc.
- Infrastructure: Government service network, Data exchange gateway, e-Government service platform, e-Payment, Government data center etc.
- Information Security: Public key infrastructure, Security operation center etc.
- Governance: Information organization, call center, training center etc.

4. E-Government Framework

In order to have an overall blueprint for the future e-Government development, it's necessary to have an e-Government Framework as the core architecture for SVG. After the understanding of SVG Government current status and the analysis e-Government trends of the world, Consultant therefore proposed the flowing e-Government Framework as a reference model for SVG Government.



The framework could be separated into six major parts in two layers. One is “E-Government Portal”, “Domain Services” and “Platform and Shared / Common Model” in the “Services Layer” and the other includes “Network Infrastructure”, “Network Assess” and “Network Service” in “Infrastructure Layer”. The meaning of each component is as follows.

4.1 Service Layer Components

4.1.1 E-Government Portal

An e-Government portal is the single window of the national users including citizen, enterprise, civil servants and system administrators. The role of the portal is to provide government-wide content, service and communication through electronic way and multi-channels such as webpages, mobile phone, KIOSK and others. The portal is also the expected to be a first understanding entry of international users, including the visitors, researchers and other organizations. Basically, the portal is the access point for users to understand and use the government information and services.

4.1.2 Domain Service

The domain service standards for the variety services provided by different ministries and the autonomous such as the resident registration service, vehicle registration service, driving license applying and management service, taxation service, land and house management service and business registration and management service. Furthermore, the agriculture, immigration, education, health, custom, culture and sports etc. are also the domain services. Those services are usually developed by corresponding ministries by their responsibilities but it's necessary to have an organization or task force to define the policy and manage the overall e-Government services development to ensure the consistency and interoperability of the services.

4.1.3 Platform and Shared / Common Model

Platform and Shared / Common Model represents the common required functions in different ministries and autonomous and the data exchange mechanism. Based on the domain services in different ministries, the new requirements are to reuse the common functions as a module and establish the data exchange gateway. The former helps the cost-saving and consistency issues and the later realize the across-agencies service. For example, every service needs an account management function and A/A (Authentication and Authorization) service. If every ministry develops their own account management functions, it's not only cost-wasting but also results the inconsistent situation - users have different accounts in different systems. Therefore, this kind of function should be developed as a common module and be centralized managed by certain organization or task force.

4.2 Infrastructure Layer

4.2.1 Network Infrastructure

The network infrastructure means the physical network especially the hardware and the physical connections, such as fiber, leased line and wireless network. The network infrastructure also includes the necessary network device such as the router, switch, wireless station and repeater etc. The network infrastructure provides the environment for data transfer and connectivity. The infrastructure is the base of the network access and network services. Unless the network access and services are launched, the infrastructure cannot reflect its value.

4.2.2 Network Access

The network access stands for the environment for accessing the network and also the management of the network. It enables the government employees to access to the government network through fix line and wireless access under the security environment. For the network access, the information security is one of the major concerns to ensure the integrity, confidentiality, accountability, non-repudiation and it's necessary for government to establish information security mechanism for on-line services and on-line transaction. The data center is the major facility to locate e-Government system servers and data especially in the cloud age.

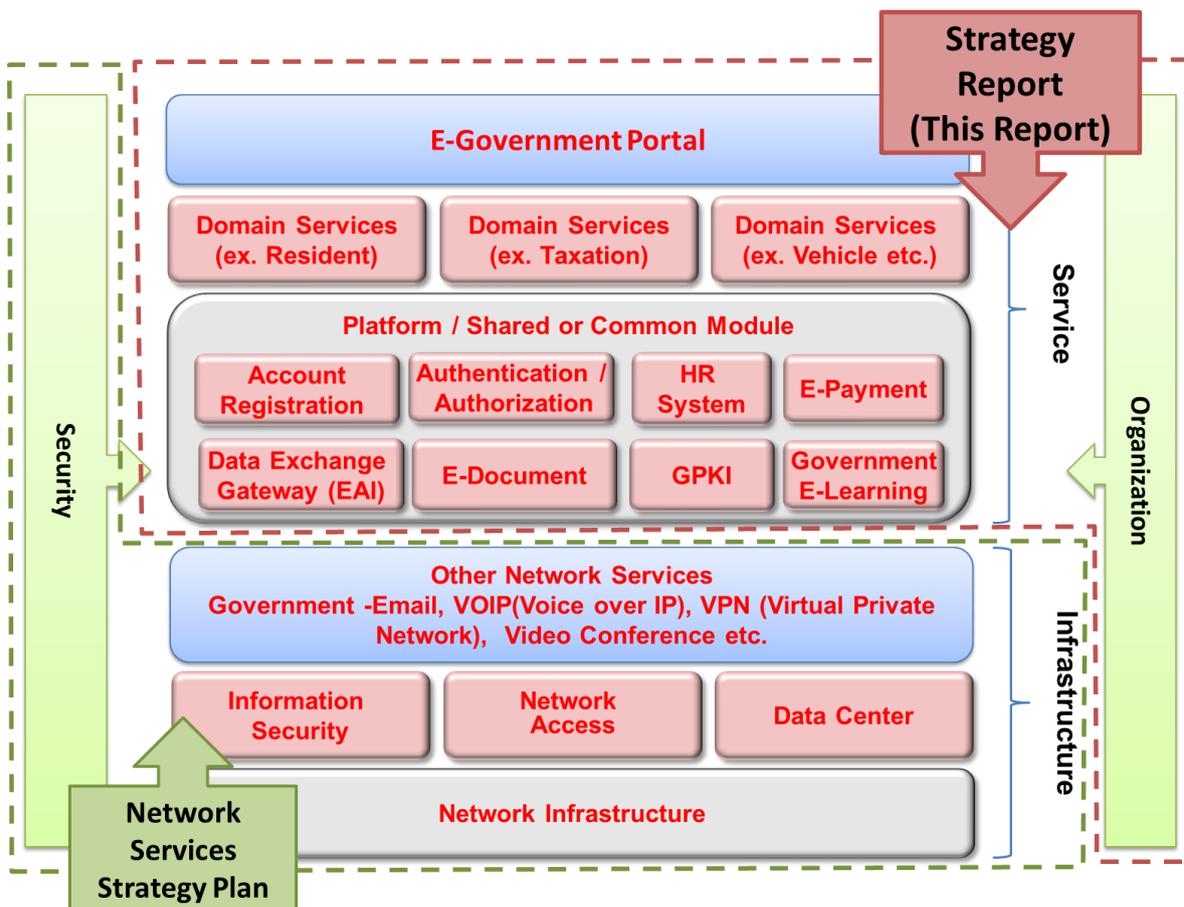
4.2.3 Network Service

The network service stands for the basic services based on the network connection and usually it's not related to certain domains and could be integrated into applications as a component. The common network services include Email, VOIP (Voice over IP), Online Payment, VPN (Virtual Private Network), Video Conference and Surveillance...etc. For the network service, there is no complex business process but it focus on the data transfer as the major purpose.

5. E-Government Development Initiatives

In order to identify the next step of e-Government development in SVG and design the e-Government development roadmap, we need to identify the items planned to be implemented in the near future. Based on the e-Government Framework described in the last chapter, Consultant proposes the suitable initiatives for SVG e-Government development. Concerning about the long term operation of e-Government, there are two issues should be taken into account including organization and security issues. The organization issues stand for the necessary arrangements or changes in the organization for promoting and managing the e-Government development, such as a high level integrator for whole country's e-Government implementation. The securities issues are emphasized in government domain because of the data between government services are usually confidential and private. It necessary to protect the data stored and transferred in the systems and network.

Therefore, Consultant uses four categories to identify the initiatives, including service initiatives, organization initiatives, infrastructure initiatives and security initiatives as the following figure.



For the service initiatives and organization initiatives, those will be described in this

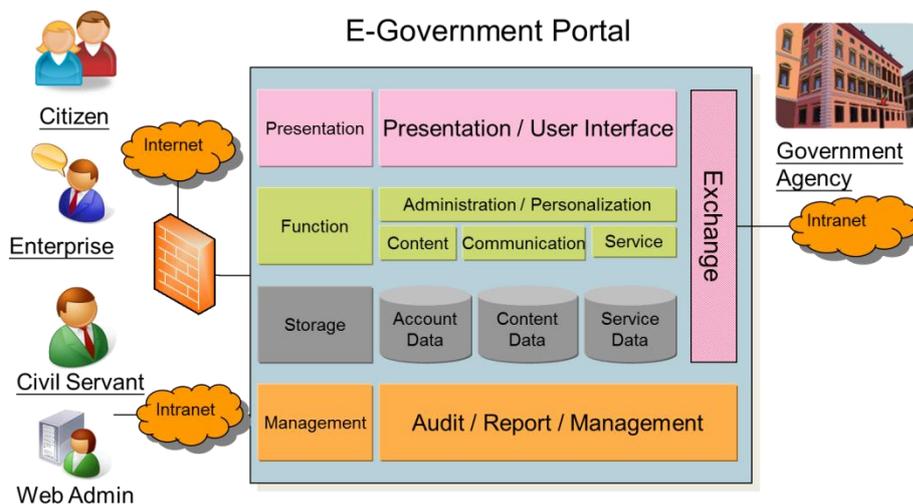
report; for the infrastructure initiatives and security initiatives, the content will be addressed in the “St. Vincent and the Grenadines e-Government Network Services Strategy Plan” Report

5.1 Service Initiatives

5.1.1 E-Government Portal

[Description]

As mentioned in 4.1.1 E-Government Portal, the e-Government portal is the single window of the national users and also international users to access government-wide content, service and communication through different electronic channels. The proposed government portal for SVG Government has the following four-level structure, including presentation layer, function layer, storage layer and management layer.



Presentation Layer

The presentation layer is in charge of the content and service presentation with the suitable interface. It could also support multi-channel devices such as the PC, PAD or mobile phone.

Function Layers

The major functions of the e-Government portal are expected to cover the following items.

- Content: the government content that should be announced to the public.
- Service: the government services to the public
- Communication: the communication channels between the public and government

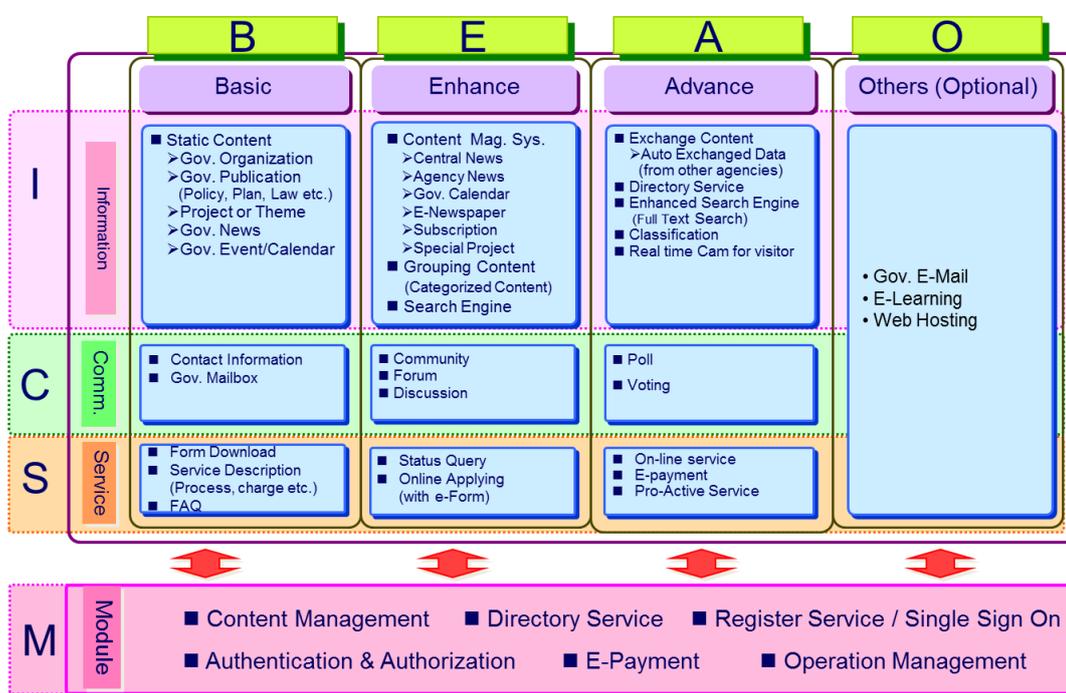
Storage Layer

It means the data storage for the account data, content data, service data etc. The data could be not only database or file system but also the directory for certain data access, such as the account, access right as well as the government organization's information.

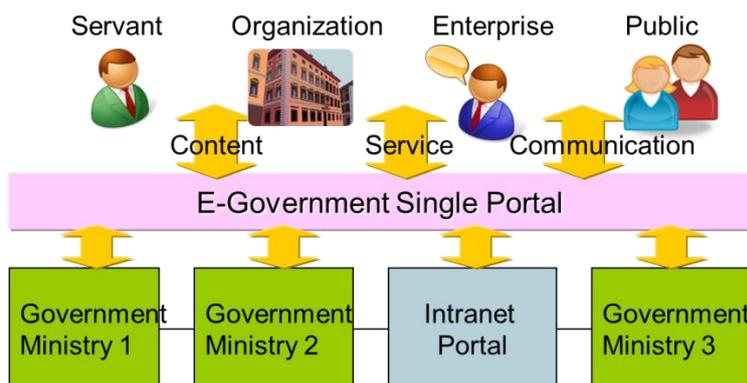
Management Layer

It stands for the system administration, audit and report function.

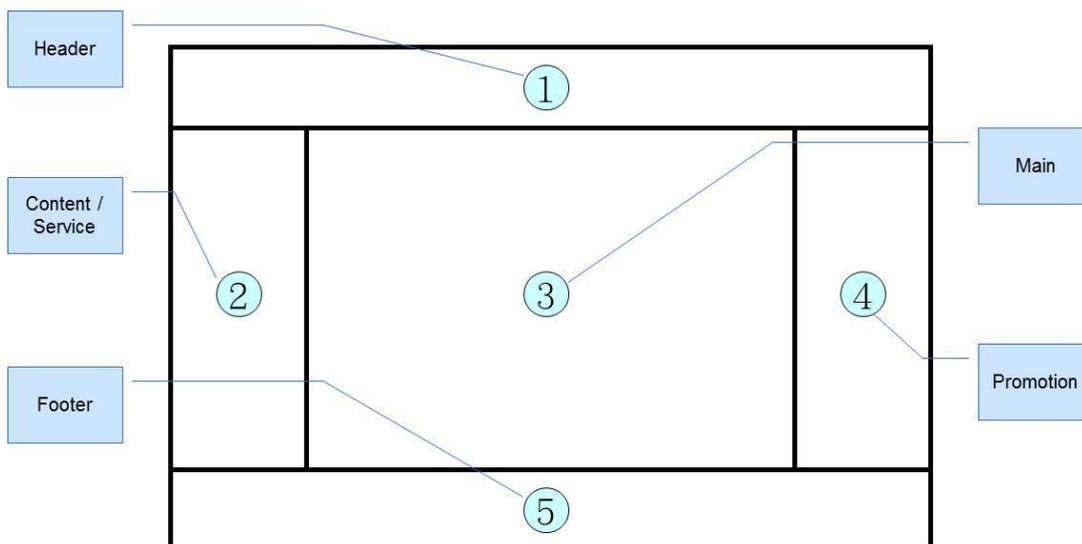
The suggested content, services and the communication channels of the SVG portal is listed as following figure.



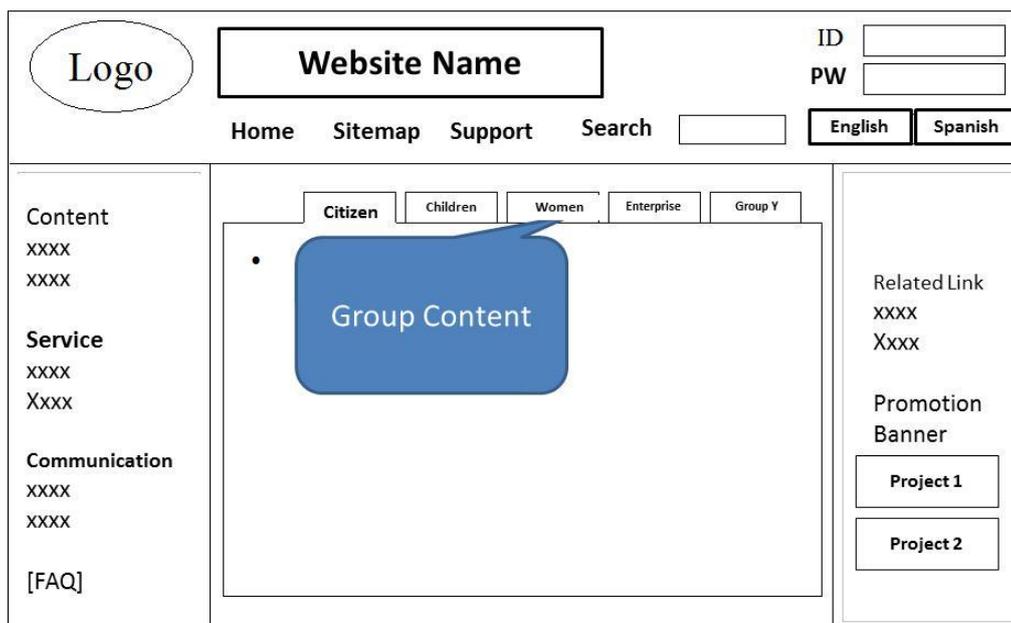
In SVG Government's current situation, there are eighteen independent websites for ministries and autonomous and also an independent intranet portal for government employees. However, for the management and using convenience, the intranet portal could be integrated into the portal in the same environment as the following figure.



For the presentation issue, in order to let users have a consistent use experience, it's suggested to define the presentation standard in the government-wide website. The presentation standard can cover the page layout, the common website component, the content presentation methods etc. The following figures show the example the standard of page layout, website component and the sample of website structure.



Importance	No	Item	Suggestion Layout Location
Must	1	Logo	Upper-Left
	2	Back to Home Link	Upper or Upper-Left
	3	Site Map	Upper
	4	Contact Information	Lower Center
Recommend	5	Browser Support	Lower Center
	6	Latest Update Time	Follow the content
	7	Grouping Content	Upper or Upper-Right
	8	Website Stamp	Lower-Left
	9	FAQ	Lower-Left
	10	Information Security Link	Lower Center
	11	Privacy Statement Link	Lower Center
Option	12	Language change	Upper-Right
	13	Search	Upper-Right or Upper-Left
	14	Login	Upper-Right
	15	Related Download	Lower-Left or Upper
	16	Related Website Link	Right
	17	Advertisement Banner	Right



Contact Information xxx-xxx-xxxx , Business Hours 8AM-4PM
 Suggest Browser xxxx, Resolution 1280x1024
 ITSD ©Copyright
 xxx@xxx.xxx

[Dependence]

For the e-Government portal development, the online service could be dependent on the PKI environment and also the e-Payment supporting to provide the end-to-end service.

For the e-Government portal, the account could be integrated with the other applications for convenience. It could be a centralized account registration, storage and authentication and authorization mechanism to realize the single sign-on target.

[Recommendation]

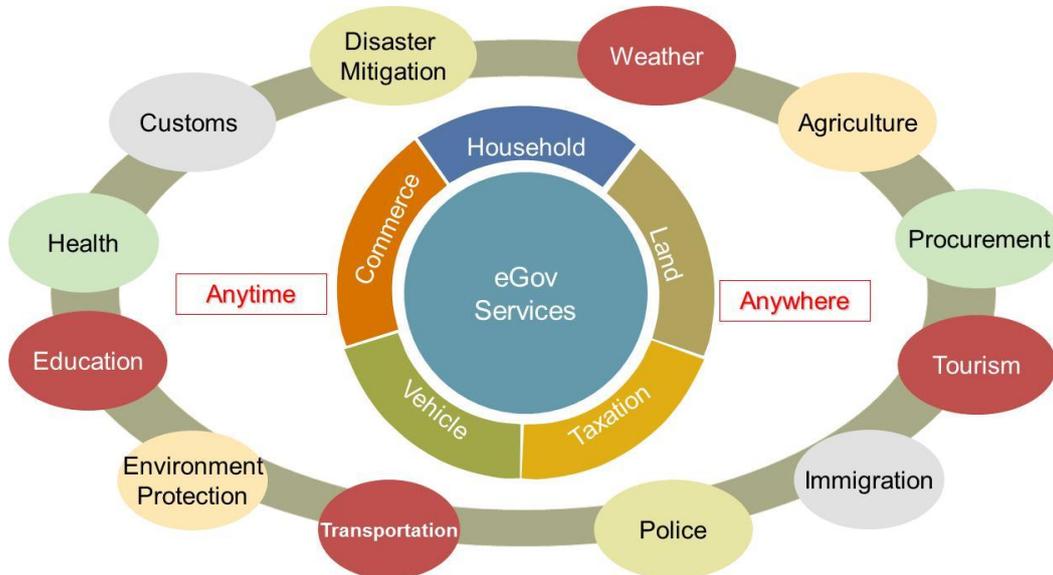
The e-Government is a continuous improved system to any country. It's not a one-off development and it takes time to improve the system and also the content. For the portal is the access point of all the users to each e-government content and services, Consultant suggests SVG to have a 3-year initiative to define the major structure and the standard of the portal as well as the functions, including the intranet portal.

5.1.2 Domain Services and Systems

[Description]

As mentioned in 4.1.2, the domain services and systems are the variety services

provided by different ministries and the autonomous such as the following figure. Those services are usually developed by corresponding ministries for their responsibilities but it's necessary to have an organization or task force to define the policy and manage the overall e-Government services development to ensure the consistency and interoperability of the services.



During the implementation of this project, Consultant conducted a survey of the “expected services” of government users. The following services are addressed most and could be the reference for SVG Government.

- Application for leave/vacation, it could be categorized into HR system or office automation field
- Payment for licenses, tax etc.
- Renewal of the passports
- Job Application
- e-Taxation
- Driver’s license and vehicle license
- Customs services(to clear items imported)
- Birth certificate and ID card
- Business & company registration

[Dependence]

The domain services are a kind of online services and could be necessary to be supported by the PKI, e-Payment and cross-agency data exchange functions. Of course, the network access between government and citizens are also required.

[Recommendation]

In the current situation of SVG Government, some of the services are developed or sponsored by some other countries or international organization following the regional promotion such as EGRIP and OECS. It is suggested SVG government keep leveraging the international and regional support but pay attention on the integration of these services. An overall control and management task force is necessary for the diversity services.

5.1.3 Account Registration and Government Directory Service

[Description]

Account registration and Government Directory Service are the mechanism for government account integration and the preparation work for single sign-on mechanism. It can be explained in two parts including registration service and government directory

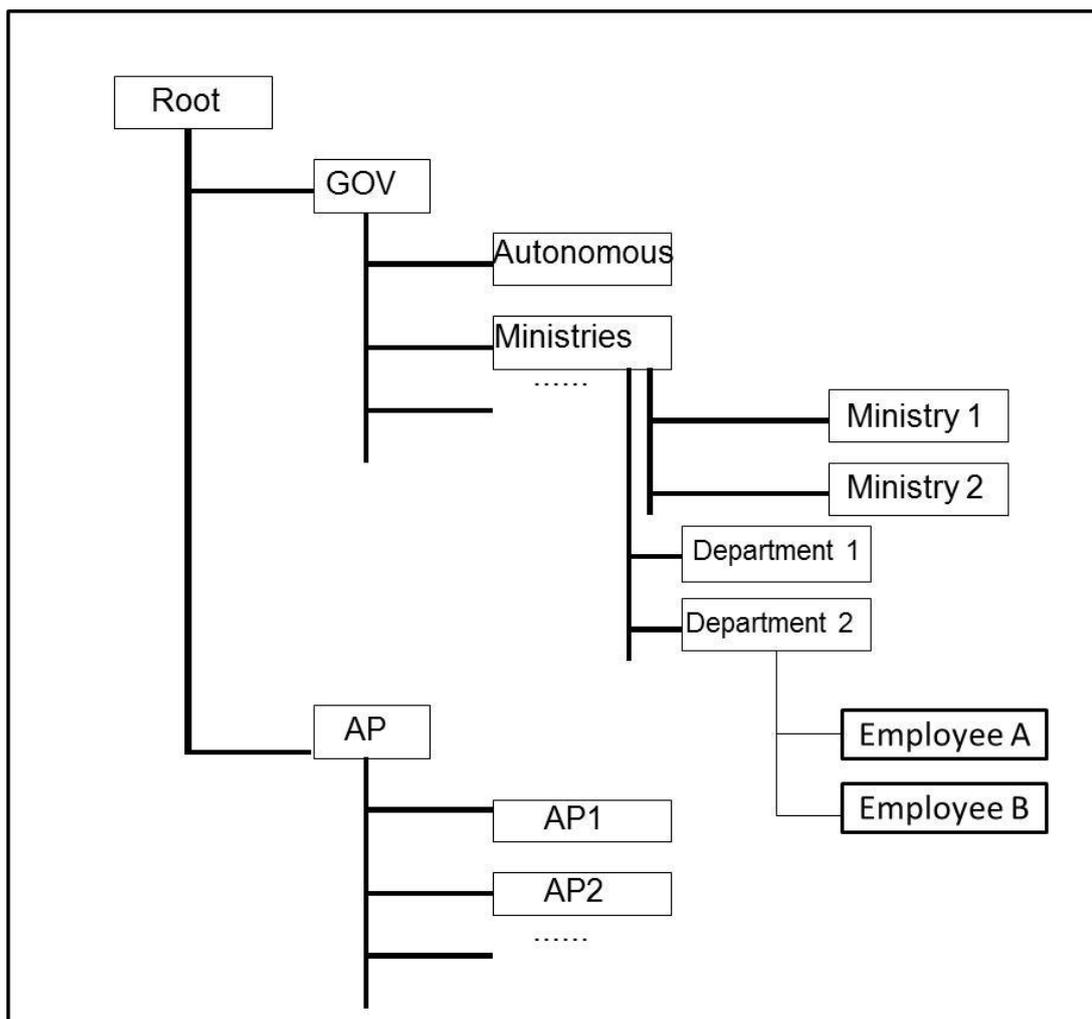
Registration service

The registration service stands for the registration function for e-government-wide objectives such as the users' accounts, the government organizations' information, service information, application attributes etc. The most frequently used field is the account registration for the users including their basic information and the access rights in the services. In SOA architecture, the service registration will be implemented for easier access. After the registration, the data must be stored in a well-structured storage for accessing and directory is usually one of the selections.

Government Directory Service

The government directory service means the directory that stores the information of government-wide objects' information and provides the application access through the standard based on X.500 ITU Standard (but the standard is so large and complex that no vendor complies with it fully and most frequently used is the LDAP). In software view, a directory is a map between names and values. It allows the lookup of values given a name, similar to a dictionary. It is a network service that identifies all resources on a network and makes them accessible to users and applications.

The directory is usually with the tree structure unlike the normal relational database structure. The characteristic is the quick response for query and usually used for authentication and authorization. The purpose of the "Government Directory Service" is to provide a secure and centralized storage for government information such as all levels government agencies and organizations, government employees, user accounts for the systems and also government services.



[Dependence]

This initiative can be implemented independently. However, the e-government services and applications must be modified to use the registration service and government directory service.

[Recommendation]

The registration service and directory service are more advanced application in the e-government field. It usually reflected the integration phase in the e-government development. It can be taken into account until the basic e-government services are built.

[Schedule]

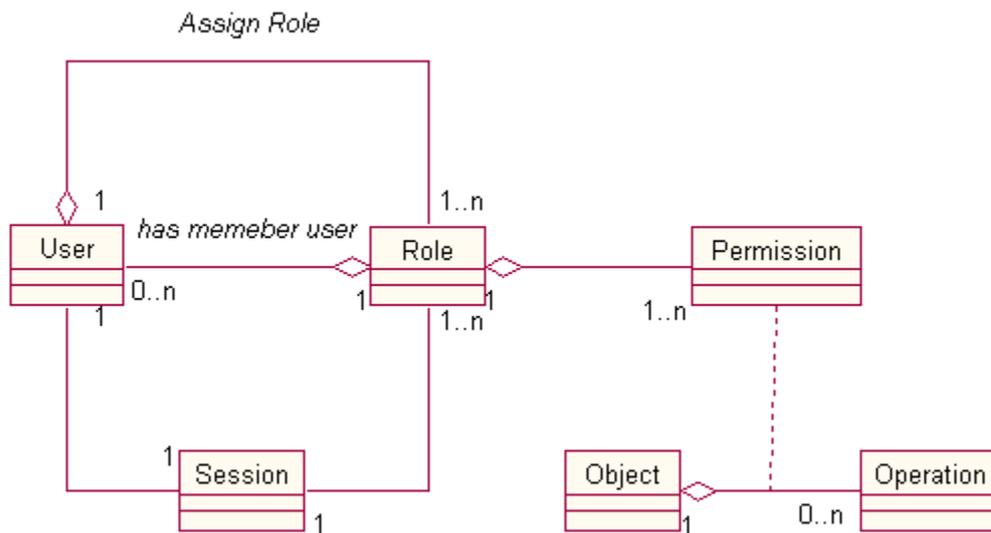
The schedule for this initiative is expected 6-9 months for plan and 12-15 months for implementation.

5.1.4 Authentication and Authorization

[Description]

The authentication and authorization mechanism is used identify the users' validity and their access rights to avoid the non-authorized using and accessing system. The authentication and authorization mechanism is a necessary module in every e-Government services and could be realized by different solutions. However, the expected situation is all the system can use the centralized account and authentication and authorization and even realizing the single sign-on.

The function of authentication is to identify if the user is valid to the system he/she is accessing. The valid means the user is registered and not expired or prohibited. After authentication, the authorization function can further identify the access rights of the user in the system or certain objectives such as application or data. In some solutions, the authorization is not a one-time task but a continuous process – identify the rights when the user accesses each function and dynamically returning the response. In implementation, the authorization is usually a role based authorization but not assigning each function as a right. The authorization model could be as following figure.



In the figure above, the User stands for the system user, the Role means the roles, like a set of the access rights, assign to the user and the Session means the login duration. A user can be assigned multiple roles in a session and each role can mapping to different permissions to access or to operate the data or function.

[Dependence]

The authentication and authorization is almost the “must to have” module in every e-government services unless the system is open to the public without any permission. To integrate the authentication and authorization mechanism to be a

centralized one must modify the corresponding e-Government services simultaneously. The authentication and authorization module also depends on the registration service and directory service. If the authentication and authorization can involve the PKI system, it's also dependent on PKI.

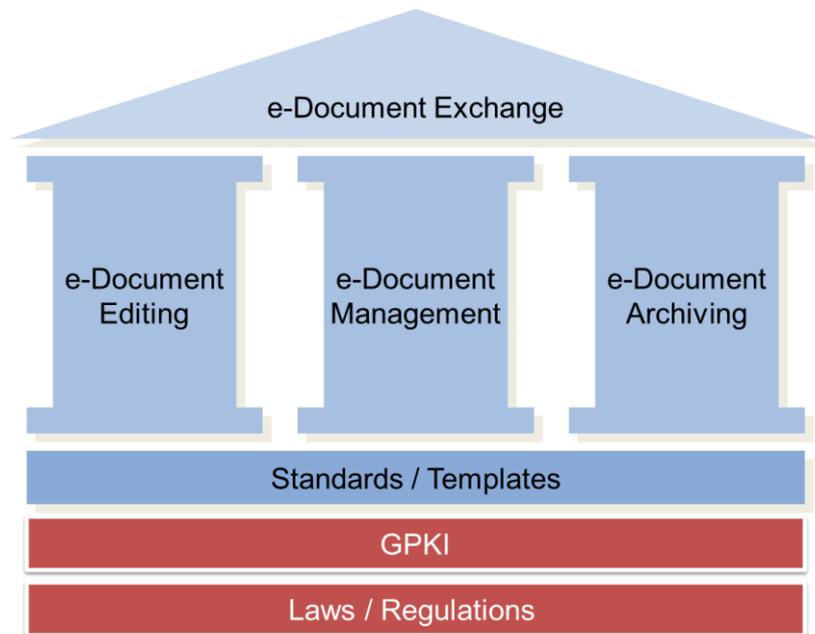
[Recommendation]

To integrate the authentication and authorization mechanism to be a centralized one is a tough but the necessary task for long term e-Government services development and management. It's suggested to have the centralized account and directory and PKI and then integrate the authentication and authorization to realize the single sign-on target.

5.1.5 E-Document Editing and Exchanging System

The e-document service in the government domain means transfer the official documents such as the letter, MEMO and contract into electronic process and storage. It helps the efficiency, accuracy and the convenience of the preparing, approval, searching and manage the official documents.

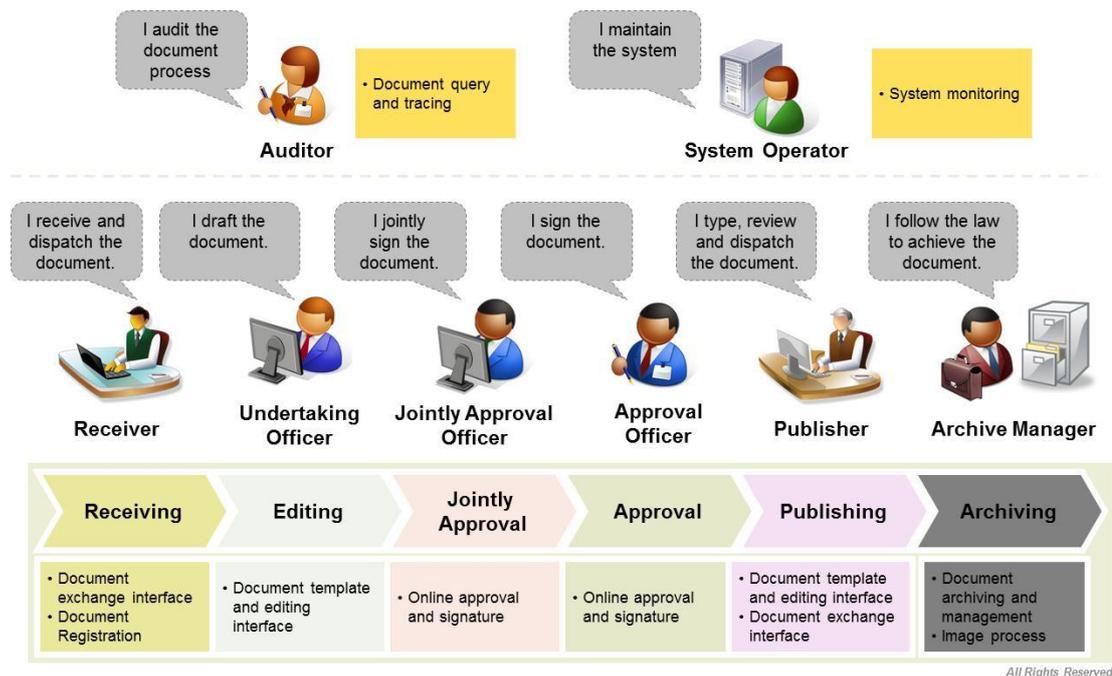
The e-document service includes the following scope and the editing and exchange are the major two systems in this application.



e- Document Editing

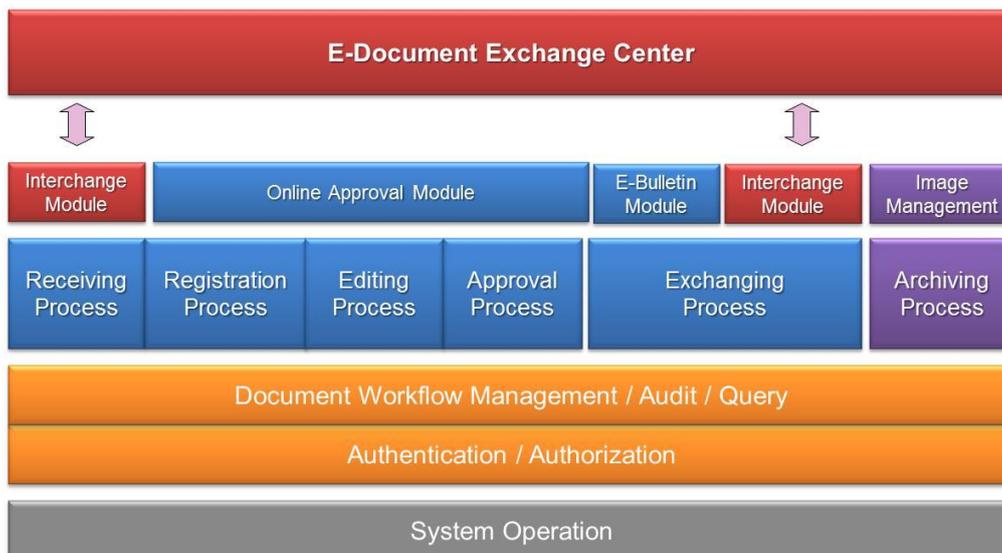
A user-friendly system page is provided to log on and type the document as well as is able to store the related contents into the database. In addition, it should be able to print the documents that a user can print for superiors to sign on and

preserve later on.



e- Document Management

The document management should include the “send” and “receive”, enabling a user to send/receive document over a user-friendly interface. Moreover, it needs to offer the online signing to the entity interior as accelerating the document handling operation.



e- Document Archiving

A system interface is offered to allow a user quickly storing the scanned file and metadata into the database and file management system. This interface should be integrated along with the scanner to provide the simplest operation in order to

meet the e-document and storage operation.

In addition, it needs to build the relationship between two documents during the preservation of the e-document, and offers the capability to inquire the historic data in the simple condition.

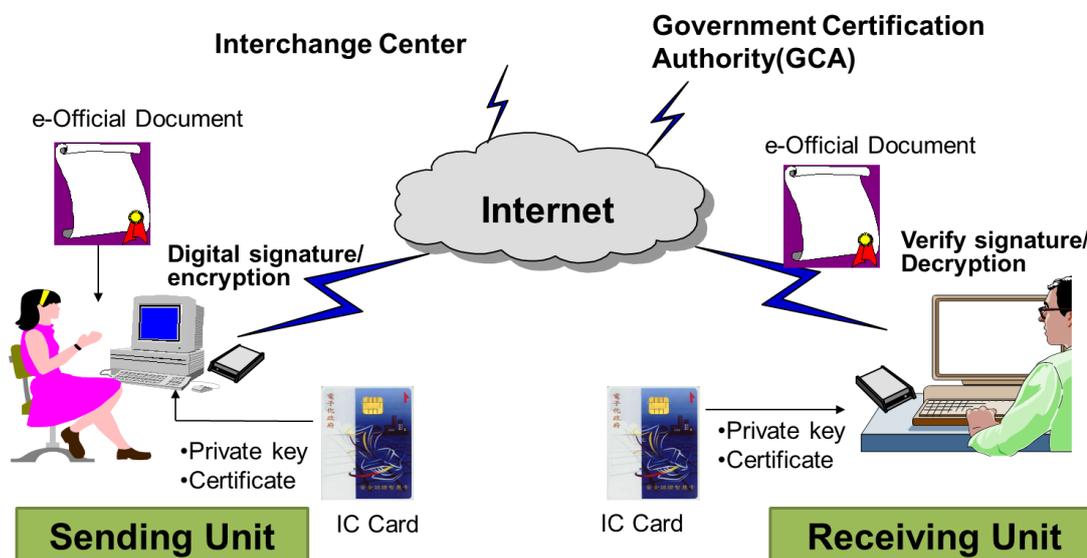
e- Document Exchange

The document-exchange mechanism mainly is to perform the inter-entity document transmission, and record the related information made during the inter-entity document transmission, such as the transmission date, sender and receiver etc., so that can facilitate for later track.

About the e-Document Exchange System architect, there are two tiers described below:

Exchange Center: This main role is to provide e-Document exchange function. Any document exchange for the registered clients must go through this center. This tier provides some local management and monitor functions, too.

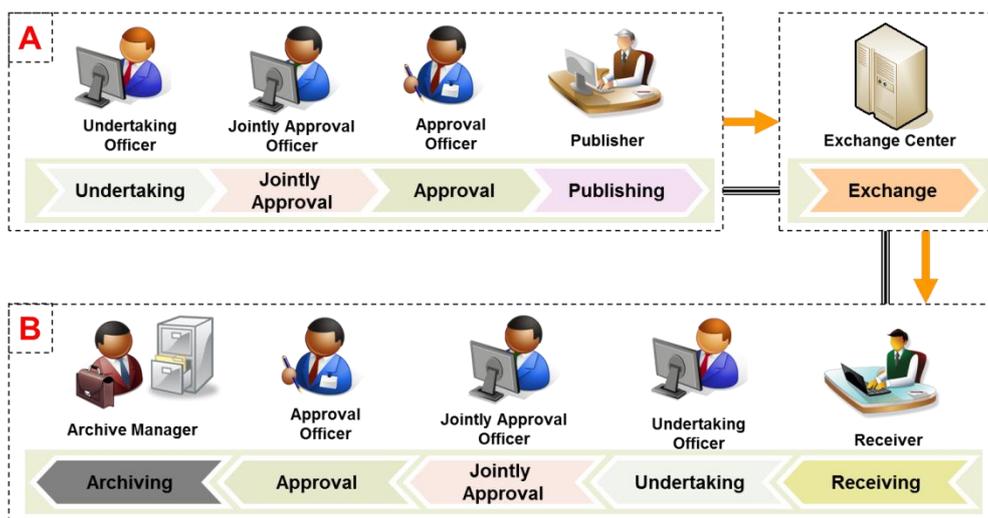
Client Side: This main role is to execute the e-Document exchange operation. End user in government agencies or enterprises can use this system to send and receive e-Document.



A PKI system can be used with our e-Document Exchange System to take advantage of all the benefits of PKI systems, mainly:

- The user sending the document is actually the originator
- The user receiving the transaction is the intended recipient
- Ensure data integrity

The typical scenario is as following figure. In the beginning, the officer drafts the document and sends for approval or affirmation. After that, the window of document publisher sends the document to exchange center for exchanging to destination agency. The receiver window of the destination agency can receive the document and dispatch to the corresponding officer to draft and get approval. Finally, the document should be archived into the system and physical document room.



[Dependence]

The e-document service is better to be based on the PKI infrastructure to ensure the information security and non-repudiation.

[Recommendation]

E-Document service is fundamental service in government filed, it's suggested to start with the archiving solution and parallely define the law and regulation, standard and templates etc. as the preparation for the implementation.

[Schedule]

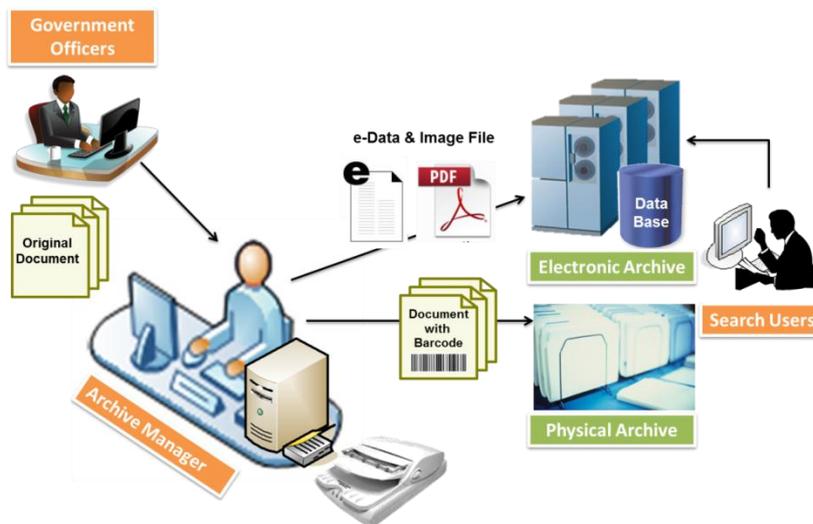
The proposed schedule of the initiative is shown as following figure.



5.1.6 E-Document Archiving System

[Description]

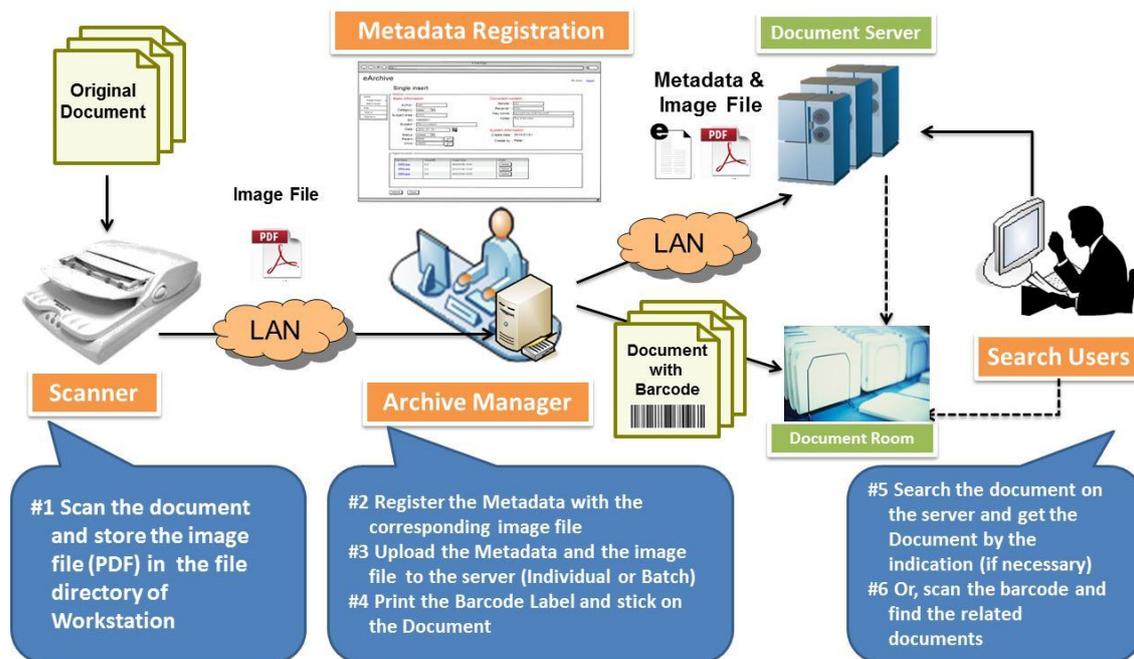
E-document archiving system is a part of the e-Document service but also related to the file archiving field. The business scenario is as following figure.



The operation process of the e-document process is as following figure.

1. Scan the document and store the image file (PDF) in the file directory of Workstation
2. Register the Metadata with the corresponding image file

3. Upload the Metadata and the image file to the server (Individual or Batch)
4. Print the Barcode Label and stick on the Document
5. Search the document on the server and get the Document by the indication (if necessary), or
6. Scan the barcode and find the related documents



[Dependence]

The system could be developed independently.

[Recommendation]

It's suggested the e-Document archiving system can be start in the selected government agencies as the pilot run and transfer to the other agencies by the successful experience.

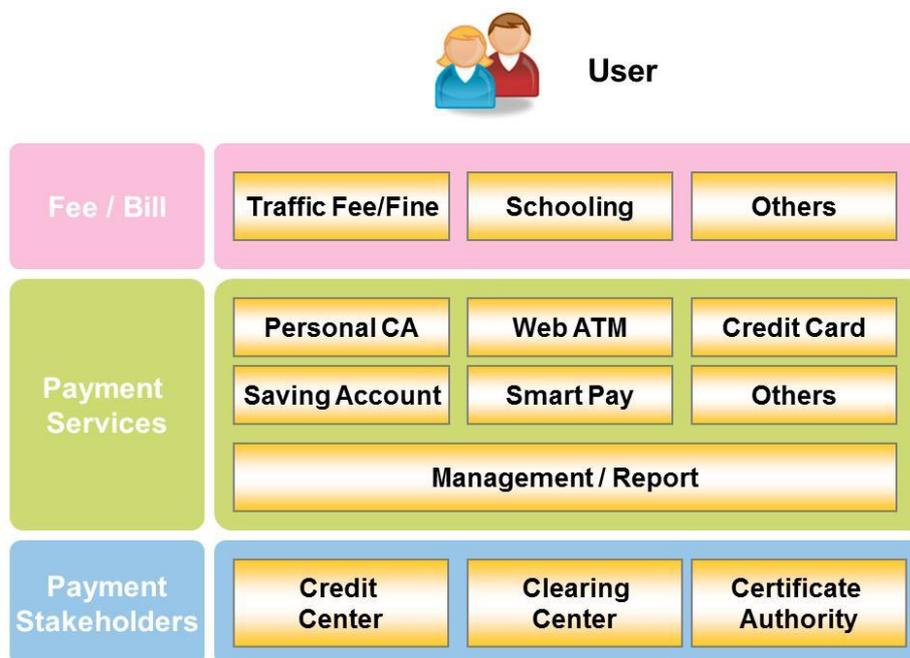
5.1.7 E-Payment Service

[Description]

The e-payment solution is one of the key points of the e-government online services especially for the charged services. Unless the government has the e-payment solution, the end-to-end online service can be realized. Therefore, the e-payment is typical common and shared service in e-government domain.

There are different solutions for e-payment provided by different service providers. However, there are some typical roles must be involved such as the

bank (or financial organization), the clearing center and of course the e-government service providers. The e-payment solutions could be host by the non-government providers such as a bank and the government plays the role as a user and supervisor. The concept of e-payment in e-government is as following figure.



The types of the e-payment solutions are as follows.

- Pay Now Solutions: pay as the service delivery
 - Debit Card deduction
 - Bank Cards / Saving account money transfer
- Prepaid Solution: pay before the service delivery. They are usually as the money stored in the physical carrier (card) or a virtual points
 - Gift Cards / Phone Cards / Transportation Card
- Postpaid: pay after the service delivery.
 - Credit Cards
 - Mobile phone bill integration

[Dependence]

- E-Payment solution can be developed independent but the standard and the connection of payment and bill must be cooperated with the e-government services.

[Recommendation]

- SVG government can lead and supervise the banks or telecom company to

provide the e-payment in e-government domain.

5.1.8 Human Resource System (Employees Database)

[Description]

The human resource system for SVG government will focus on the government employees' database. The purpose is to manage the employees and support the related systems working, such as the asking for leave application, e-learning management, accounting and e-document service. It's also an important input for the e-government account establishing and services authentication.

The human resource system usually includes the life cycle of employees such as hiring, training, performance management, compensation or reward and retiring etc. However, the most basic requirements are to identify the accurate government employees' data and formulate the consistent registration and management mechanism for new coming and leaving employees.

[Dependence]

The human resource system (or database) provides the necessary data to some other e-government services and helps the accurate management in government field.

[Recommendation]

The most import function in human resource is the government employee's data management and it's recommended to formulate the system as soon as possible. For the other functions such as training and performance management, it can be separated into the second phase implementation.

[Schedule]

- 6 months for government employee's data management and data clearing.
- 9 months for the other functions development.

5.1.9 Office Automation

[Description]

This project is to provide an Office Automation system with following functionalities - task assignment and workflow management (including the application of asking for leave, internal application etc.), and scheduling.

To implement this project, certain existing administrative processes may need to be defined, changed or modified. Moreover, if applied to classified documents, digital certification and signature mechanism need to be considered.

[Dependence]

- This project can be implemented independently.
- If applied to service needed to be authorized or higher confidential, the PKI infrastructure is required.

[Recommendation]

- COTS package (Commercial-Off-The-Shelf) could be the one of the option as SVG can quickly implement it with minimal effort and reasonable cost.
- In the initial steps, it is recommended that SVG to implement OA in the certain agencies as a pilot, then deploy to other ministries and agencies when applicable. In addition, to minimize the difficulty of administrative changes required, SVG should better implement the system to manage only the application with little requirement for authentication.
- It has been noted in the implementation period that SVG does not have an overall data and security model that classify the information, and the level of confidential of that information. This model should be developed together with the progress of this project.

[Schedule]

- 6 months is estimated for the pilot implementation at the selected agency.

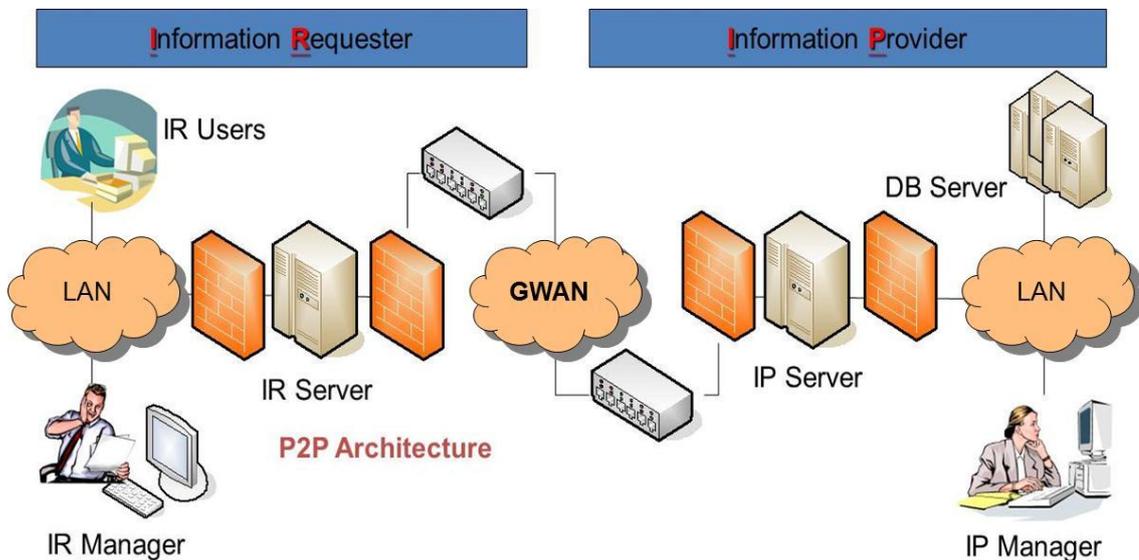
5.1.10 Data Exchange Gateway and EAI Backbone

[Description]

Data Exchange Gateway

For more and more e-government services launched in SVG, some of the services must face the data exchange requirements such as the immigration system has to check the citizen's data, the police has to check the driver's license and car's registration data. For these requirements, there must be a data exchange mechanism to fulfill the requirements. A data exchange gateway is one of the solutions for government. The data exchange gateway is composed with two roles- one is information provider and the other is information requester. The connection between these two users' agencies must be linked and standardized in certain format as the following figure. When the information requester faces the requirements to query or to verify the other agency's data, he/she can send the request through the GWAN to the information provider and the information provider, usually an agent application, will verify the request is from the valid

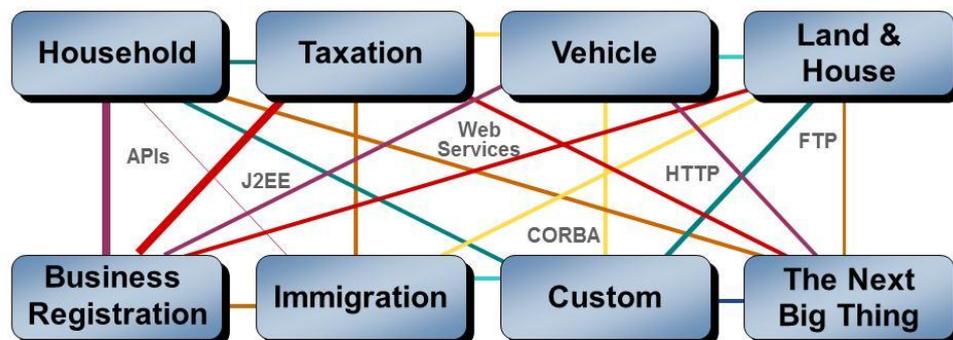
requester and then query the necessary data for response. This is the most intuitive architecture, the peer to peer architecture, for data exchange and could be easily implemented. Therefore, it's usually the initial mechanism for government data exchange and gradually improved to new architecture.



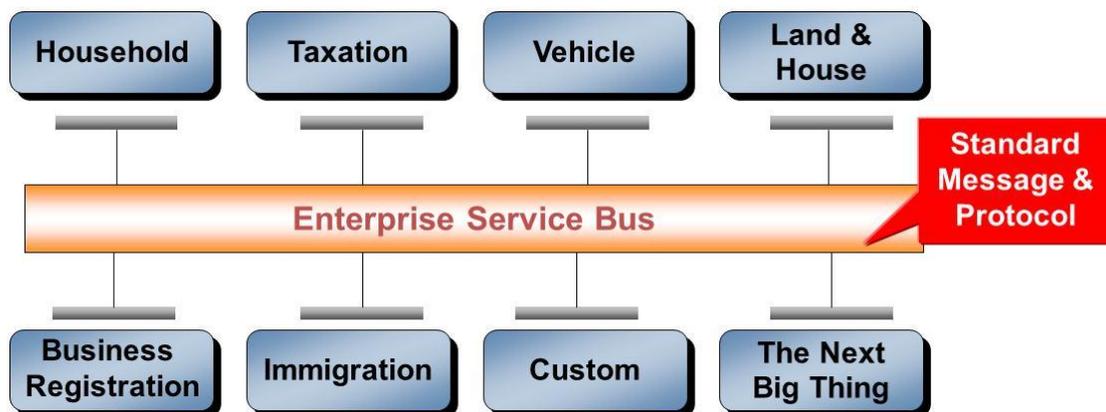
EAI Backbone

Accompanying with the e-government service diversification, the number of application systems will increase dramatically and the interactive relationship will become complicated as well. When the relationship of application systems becomes complex, it will be a disaster. In order to meet the IT strategic objectives, a data exchange gateway the EAI framework design should be considered.

For the EAI, it's a software architecture construct that is based on recognized standards and provide fundamental services for more complex architectures via an event-driven and standards-based messaging engine (the bus). ESB (Enterprise Service Bus) is the EAI with the bus topologies and recognized standard



Typically, the cost of software maintenance and development is 2:1



EAI is the glue needed for modular relationships that allow organizations to be flexible and responsive to market demands. The strategic advantage of EAI is not just the exchange of data, how to achieve data exchange is important as well. An EAI implementation and the service-oriented architecture (SOA) technologies could integrate the systems and simplify the way of interactive among systems.

When SVG Government implements the EAI framework, mature EAI platform can be chosen to speed up the implementation. On top of the selected EAI platform, “System Integration Adaptor” should be developed for the seamless integration with the e-government services. Due to the customer and accounting-related information is under the management of the e-government services, an interfacing mechanism has to be set up when others systems need to access or update the information kept in the e-government services.

In terms of functions of the System Integration Adaptor, it can speed up the system integration and make the systems easy to maintain.

[Dependence]

- The data exchange gateway must be based on the PKI support.
- EAI is based on the well-defined data exchange standard

[Recommendation]

- Build the data exchange gateway and define the data exchange standard first

[Schedule]

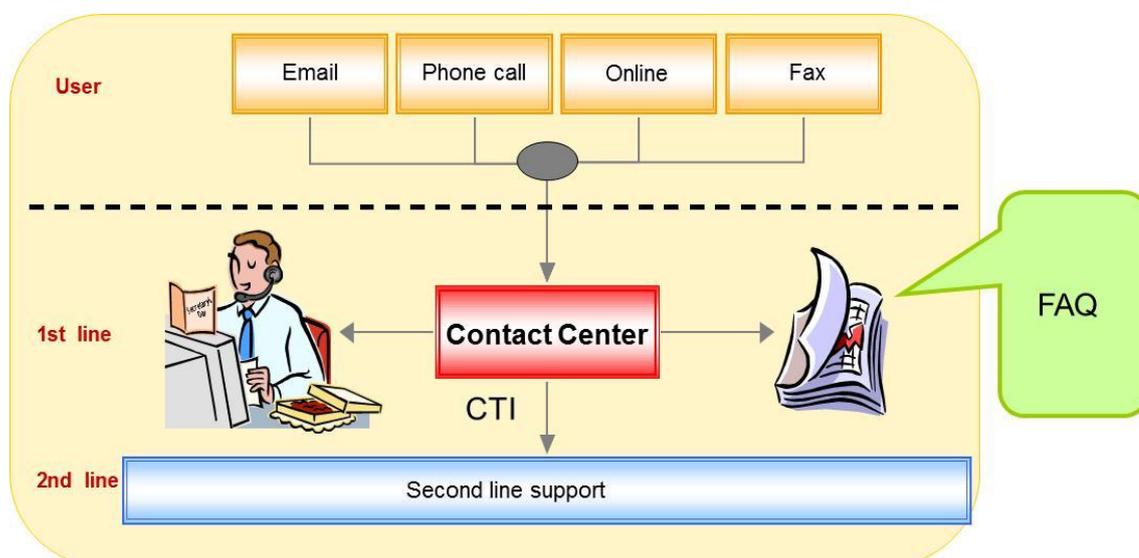
- 9~12 months for developing data exchange gateway
- 6 ~ 9 months for planning the SVG Government EAI
- 15 ~ 18 months for Building up the EAI backbone

5.2 Organizational Initiatives

5.2.1 Government Contact Center

[Description]

To provide quality IT supports in a timely manner for the roll-out e-Government services, establishing a contact center is recommended to be the first organizational initiatives. After the delivery of the e-Government service, some of the structure of the e-Government service will be changed from decentralized structure to centralized one. TSTSP/ITSD has to serve all the citizen and ministries for any problem on daily operation or IT requests. Therefore, a well-organized contact center should be considered to provide efficient problem solving services to the users. The contact center should be well tuned prior the high volume of requests coming in.



According to the structure of contact center shown in the diagram above, the contact center will provide first line support to handle day-to-day operational help. The call center shall allow both internal and external customers to call-in via multiple channels, such as email, online, phone call, fax, etc. The functions of the second line support are to research new issues, to provide solutions to the first line support and to handle requests from citizens.

[Dependence]

Since the contact center is setup to support the newly implementing e-Government service, its progress or necessity will be dependent on the other e-Government service.

[Recommendation]

- The staffs and the tasks involving in the contact center will be complex and

tremendous. The overall organization structure, each staff's role and their workflow should be carefully illustrated to increase users' satisfaction and improve the work model of the staffs in the contact center.

- Trouble shooting and FAQ (a kind of knowledge base) systems should be established to allow the first line operators able to solve requests directly and quickly and to minimize the needs to forward the requests to the second line supports.
- System and process evaluation methods should be defined and review constantly. For instance, service level agreements, customer satisfaction survey and evaluation matrices, performance evaluation mechanisms, etc.
- COTS (Commercial off the Shelf) solution should be the best option for SVG to build quickly the system with minimal efforts. For instance,
 - IVR (Interactive Voice Response) – allow a computer to detect phone calls and automates interaction with telephone callers
 - User interface system - an interface for all agents and supervisors to process incoming telephone calls, faxes, e-mail and web interactions, as well as perform other key functions
 - Knowledge based system

[Schedule]

- Phase 1: 6 months, including training staffs, troubleshooting initial development and exercising the newly defined processes.
- Phase 2: Aligning with e-government service development plan. 1 month for introducing each new service

5.2.2 Online Training Project (E-Learning Project)

[Description]

Provide proper training to government employees. The subjects of the training could be new hiring training, working knowledge on specific application training and employee skill or career development training.

[Dependence]

It could be implemented independently.

[Recommendation]

- Purchase or develop the software for online training; use existing training facilities and hardware
- Purchase computer-based training courses (CBT) in form of interactive media courseware that can run on PCs or download via a website. Support offline training for branches with limited network connection.
- Offline CBT training material should be the focus for IT staff training for enhancing the capabilities for future operation.
- Functional changes in the application software should synchronize with content of the training materials. Version control procedure should cover this issue.
- Forum and FAQ should be created and the content should be updated to trouble shooting database maintained by the contact center

[Schedule]

- 6 to 9 months for the system development and 1-2 months for the content development and update to the changes

5.2.3 Enhancing Compensation and Incentive Packages

[Description]

Talented staffs are one of the government's major assets. To recruit qualified and skillful talents and to leverage their brainpowers have become a major topic to increase government's competitive advantages. Talented people contribute tangibly and vitally to the innovation, development and delivery of pivotal services and products. Managing them in a well-defined organization and under proper roles could evoke their passion and maximize their contribution.

The purposes of compensation and incentive programs can be separated into three categories, including attracting new employees, increasing the working efficiency and retaining the talents.

[Dependence]

N/A

[Recommendation]

Enhancing compensation, incentive and benefit packages

5.2.4 Rebalancing Organization

[Description]

As mentioned in this report, for the better management of the e-Government development and interoperability between g-Government services, to forming the high position task force or organization is a necessary action. The task force or organization is not only managing the development of e-Government but also evaluating the performance and the necessity of e-Government investment to reduce the redundant investments.

[Dependence]

N/A

[Recommendation]

- Form a “Task Force” in SVG Government (report to Prime Minister) in charge of inter ministers communication

[Schedule]

- 6 months to develop organization architecture and roles
- 3 months to implement the plan

5.2.5 Service Continuity Plan

[Description]

In order to ensure the availability of e-government service functions, especially for critical service processes and operations, continue to operate during and after a disaster. SVG Government should establish a Service Continuity Plan to prevent from interruption of mission critical services and re-establish services to a fully functional level as quickly and smoothly as possible.

The development steps for SCP Planning are as follow:

- Assessments and Analyses (Define ITSCM Scope)

SVG Government should define the IT Service Continuity Management scope (which service processes and systems should be covered) and determine maximum acceptable downtime for each business processes and system.

- Requirements Analysis and Strategy Definition

SVG Government should do the Impact Analysis including identify risks, define

impact and probability of risk, determine risk control strategy, define cost of protecting, prioritize the risk, and list out-of-control variances. After that, it can help to determine the recovery priorities of each business process and system and corresponding recovery strategy.

- Implementation Management

The action items of this step are as follows:

- Establish the task force and develop implementation plans
- Implement stand-by arrangements
- Implement risk reduction measures
- Develop Disaster Recovery Plans (DRPs)
- Develop Standard Operating Procedures (SOPs)
- Undertake initial tests

- Operational & Management

The action items of this step are as follows:

- Education and awareness of recovery team members
- SOPs operate training and review DRP periodically
- Audit education and awareness activities, training record
- Practice DRP periodically
- Update DRP to take into account the findings of monitoring and reviewing activities
- Make sure DRP align with business continuity objectives

[Dependence]

It is relative to the DR Center.

[Recommendation]

- Define the recovery goals and objectives as clear as possible
- Define Who and When will activate the SCP
- Specify the disaster reactions (which disaster types will or will not be addressed in the plan)
- Training of employees in recovery procedures

- Ongoing review and revision of the plan

[Schedule]

- 9 months

6. E-Government Development Roadmap

The initiatives identified in this report are suggested to be divided into four-year development roadmap as following sections.

6.1 Roadmap for Service Initiatives

The roadmap of ten (10) service initiatives is shown as following figure, including four phases in the roadmap. For the schedule, it's expected to be mapping to the next three and half year, from the middle of 2012 to the end of 2015, if the resources and implementation supports are fully allocated. However, the timeframe should be shifted or extended, for example each phase mapping to one and half year, based on the available resources and the overall environment.

Portal	Enhance the portal content and integrate the intranet portal	Enhance the portal content, online service and the functions of intranet portal	Integrate the e-payment, account registration, A/A functions	Continue the maintenance and enhancement by new requirements
Domain Services and Systems	Develop the services with the current pace	Enhance the e-gov service and start to plan the integration and exchange issues	Enhance the service quality & integration of e-gov services	Enhance the service quality & integration of e-gov services
Account Registration and Government Directory Service	N/A (Use the current mechanism)	Start to plan and analyze the overall architecture	Establish the system for pilot run	Extend the usage to different e-gov services
Authentication and Authorization	N/A (Use the current mechanism)	Start to plan and analyze the overall architecture	Develop the system pilot run	Extend the usage to different e-gov services
E-Document Editing and Exchanging System	Start to identify the law, regulation and process rules in government	Develop editing system for pilot run and plan the exchange system	Extend the editing system and develop the exchange system for pilot run	Extend the usages and develop online approval system
E-Document Archiving System	Develop the archiving system as a pilot run	Extend the use to more agencies, and Integrate with the doc editing system	N/A	N/A
E-Payment Service	Start to plan and invite financial organization for discussion	Plan and analyze the architecture and setup the law and regulation	Develop the e-payment solution for e-gov services	Extend the payment channels and the usage in more e-gov services
Human Resource System	Start to collect and clearing the data	Develop the government employee database and management function	Extend the training and performance management function	Extend the other functions if necessary
Office Automation	Start to collect the requirements and allocate resource	Develop the workflow engine and online "ask for leave" system	Extend the other applications for internal process	N/A
Data Exchange Gateway and EAI Backbone	N/A	Start the analysis for the architecture and requirements	Develop the data exchange gateway as pilot run	Extend the data exchange gateway and start the plan for EAI backbone

The core concept and the focus in the four phases in the roadmap are as follows.

6.1.1 Initial Phase

The initial phase is expected to start from the middle of 2012 and ends at the end of 2012. The major purpose in this phase is to establish the foundation for the coming e-Government development. The major tasks in this phase are to plan and identify the environment for e-government development such as setting up the law and regulation, identifying the standards of application, clearing the existing data and collecting the requirements of the e-Government services. The tasks identified in the roadmap above are as follows.

- Enhance the portal content and integrate the intranet portal
- Continuously develop the e-government domain services with the current pace
- Start to identify the law, regulation and process rules of e-document service in government field
- Develop the e-document archiving system as a pilot run
- Start to plan the e-payment solution and invite financial organization such as banks for discussion
- Start to collect and clearing the government employees' data
- Start to collect the requirements and allocate resource for the office automation service

6.1.2 Enhanced Phase

The enhanced phase is expected to be mapping to the whole year in 2013. The major purpose in this phase is to develop more e-government services as well as to extend the services to more government agencies. Briefing speaking, it's to enhance the penetration of e-government services in government agencies. In the phase, it's also the start to prepare the integration and data exchange issues. The major tasks in this phase are as follows.

- Enhance the portal content, online service in national portal and enhance the functions in intranet portal
- Enhance the e-government services and start to plan the integration and exchange issues
- Start to plan and analyze the overall architecture of the centralized account registration and directory service
- Start to plan and analyze the overall architecture of the centralized authentication and authorization service
- Develop e-document editing system for pilot run and plan the e-document exchange system

- Extend the use of e-archiving system to more agencies and integrate the metadata and process with the e-document editing system
- Plan and analyze the architecture and setup the law and regulation for e-payment
- Develop the government employee database and management function
- Develop the workflow engine and online “ask for leave” system as a pilot
- Start the analysis for the architecture and requirements for data exchange mechanism

6.1.3 Integration Phase

The integration phase is expected to be mapping to the whole year in 2014. It's expected there will be more and more e-government services being launched. Therefore, the major purpose in this phase is to establish the integration and data exchange environment and e-payment solution for e-government services. For the individual e-government service, it's still needed to enhance the quality and convenience as usual. The tasks identified in the roadmap in this phase are as follows.

- Integrate portal with the e-payment, account registration, authentication and authorization service functions
- Enhance the service quality & integration of e-government services
- Establish the centralized account registration and directory system for pilot run
- Develop the centralized authentication and authorization system for pilot run
- Extend the e-document editing system to other agencies and develop the e-document exchange system for pilot run
- Develop the e-payment solution for e-government services
- Extend the training and performance management function in HR system
- Extend the workflow engine to other applications for internal process
- Develop the data exchange gateway as pilot run

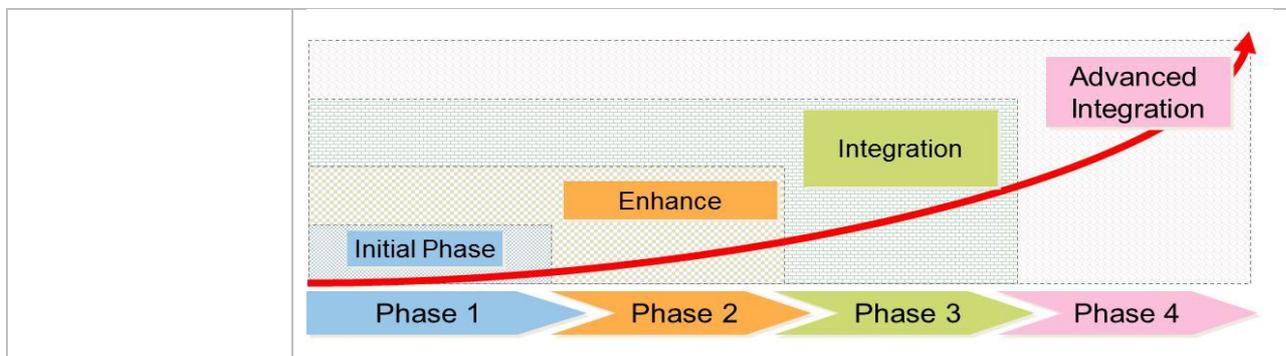
6.1.4 Advanced Integration

The advanced integration phase is expected to be mapping to the whole year in 2015. The major purposes in this phase are based on the developed integration environment to enhance the e-government services to be more closed and inseparable services. That means provide the service as a government but not many government agencies. The users can finish the service as a one stop service and end-to-end service, including application, status check and payment, and even get the outputs online. The tasks identified in the roadmap in this phase are as follows.

- Continue the enhancement the content and services in the portal and the maintenance by new requirements
- Enhance the service quality& integration of e-government services by launching the shared modules
- Extend the usage of centralized account registration and directory system to different e-government services
- Extend the usage to of authentication and authorization system to different e-government services
- Extend the usages of e-document and develop online approval system
- Extend the e-payment channels and the e-payment usage in more e-government services
- Extend the workflow engine in other functions if necessary
- Extend the data exchange gateway to different e-government services and start the plan for EAI backbone

6.2 Roadmap for Organizational Initiatives

The roadmap of five (5) organizational initiatives is shown as following figure. The timeframe mapping is as same as the service initiative roadmap.



Government Contact Center	N/A	Plan and analyze the government contact center	Develop the government contact center with selected channels	Extend the service channels and quality
Online Training Project (E-Learning Project)	N/A	Plan and develop the online training system for government employees	Enhance the courses materials and integrate with the HR performance	Enhance the courses materials
Enhancing Compensation and Incentive Packages	N/A	Plan and analyze the requirements and gap and propose the package	N/A	N/A
Rebalancing Organization	Review and analyze the feasibility	Plan and propose the structure for e-Government management	N/A	N/A
Service Continuity Plan	Start from the individual system or case	Plan the overall e-government service continuity plan	N/A	N/A

6.2.1 Initial Phase

The initial phase is mainly the preparation and gap analysis for the initiatives such as the environment review and feasibility study. The tasks identified in the roadmap in this phase are as follows.

- Review and analyze the feasibility for rebalancing organization
- Start the implementation of service continuity from the individual system or case, such as the portal integration and e-document archiving system

6.2.2 Enhanced Phase

The enhanced phase is the major period for organizational initiatives. The organizational initiatives are expected to be implemented parallelly with the other initiatives and act as the supporting action for e-government development and operation. The tasks identified in the roadmap in this phase are as follows.

- Plan and analyze the government contact center

- Plan and develop the online training system for government employees
- Plan and analyze the requirements and gap and propose the Compensation and Incentive Packages
- Plan and propose the structure of rebalancing organization for e-Government management
- Plan the overall e-government service continuity plan

6.2.3 Integration Phase

The integration phase will be emphasized on the execution of the initiatives. The tasks identified in the roadmap in this phase are as follows.

- Develop the government contact center with selected channels, such as e-mail and telephone
- Enhance the courses materials in training system and integrate with the HR performance management function

6.2.4 Advanced Integration Phase

In advanced integration phase, it's suggested to continue improve the initiative as follows. The initiatives need to be continuously reviewed and improved.

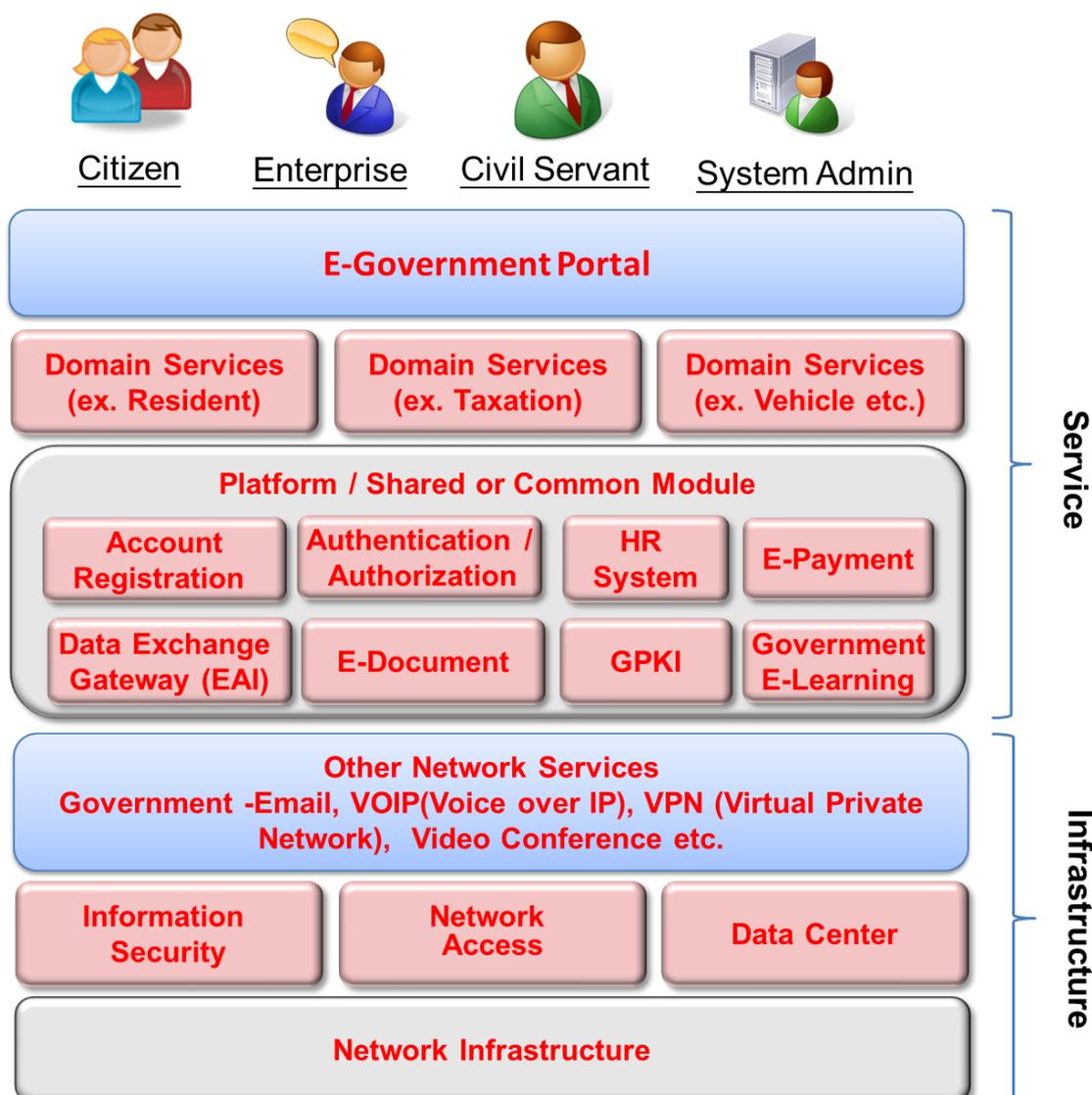
- Extend the service channel, such as instant message and outbound calls and quality in government contact center
- Enhance the courses materials in training systems

7. Conclusion and Recommendation

7.1 Implementation Strategy and Recommendation

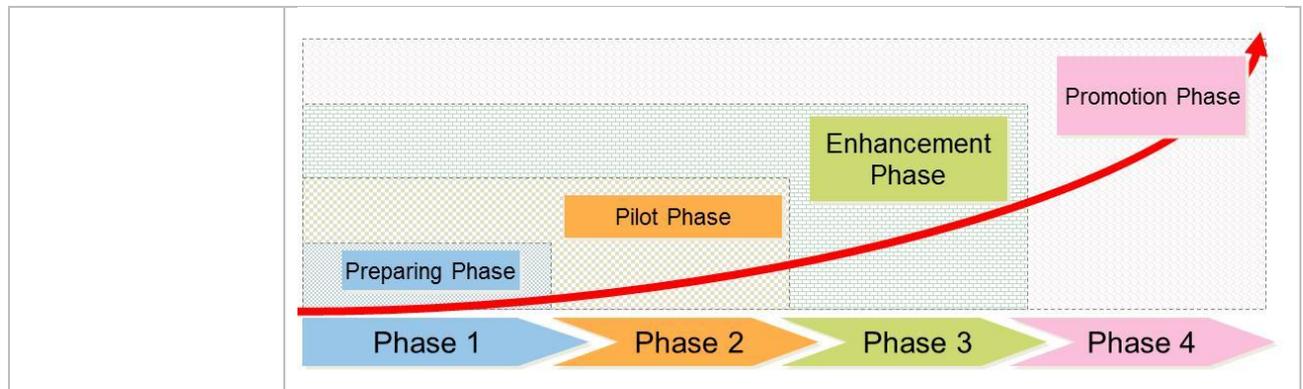
7.1.1 Recommendation on E-Government Framework

The proposed E-Government Framework for SVG Government is as following figure. The framework could be separated into six major parts in two layers. One is “E-Government Portal”, “Domain Services” and “Platform and Shared / Common Model” in the “Services Layer” and the other includes “Network Infrastructure”, “Network Assess” and “Network Service” in “Infrastructure Layer”. The meaning of each component is described in P.18: “4- E-Government Framework.”

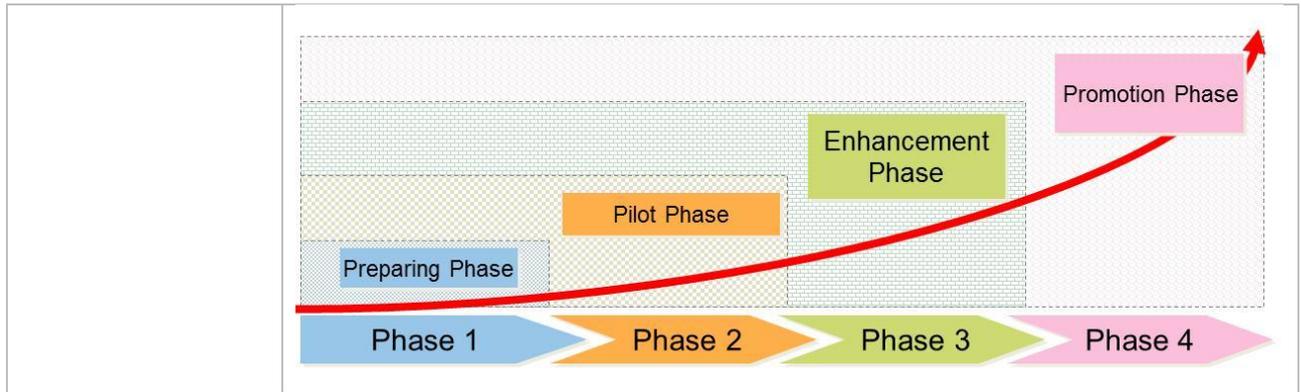


7.1.2 Recommendation on E-Government Development Roadmap

The roadmap of the ten (10) service initiatives and five (5) Organizational Initiatives are shown as following figures. For the detailed description of each phase, please refer to P.48: "6- E-Government Development Roadmap".



Portal	Enhance the portal content and integrate the intranet portal	Enhance the portal content, online service and the functions of intranet portal	Integrate the e-payment, account registration, A/A functions	Continue the maintenance and enhancement by new requirements
Domain Services and Systems	Develop the services with the current pace	Enhance the e-gov service and start to plan the integration and exchange issues	Enhance the service quality & integration of e-gov services	Enhance the service quality & integration of e-gov services
Account Registration and Government Directory Service	N/A (Use the current mechanism)	Start to plan and analyze the overall architecture	Establish the system for pilot run	Extend the usage to different e-gov services
Authentication and Authorization	N/A (Use the current mechanism)	Start to plan and analyze the overall architecture	Develop the system pilot run	Extend the usage to different e-gov services
E-Document Editing and Exchanging System	Start to identify the law, regulation and process rules in government	Develop editing system for pilot run and plan the exchange system	Extend the editing system and develop the exchange system for pilot run	Extend the usages and develop online approval system
E-Document Archiving System	Develop the archiving system as a pilot run	Extend the use to more agencies, and Integrate with the doc editing system	N/A	N/A
E-Payment Service	Start to plan and invite financial organization for discussion	Plan and analyze the architecture and setup the law and regulation	Develop the e-payment solution for e-gov services	Extend the payment channels and the usage in more e-gov services
Human Resource System	Start to collect and clearing the data	Develop the government employee database and management function	Extend the training and performance management function	Extend the other functions if necessary
Office Automation	Start to collect the requirements and allocate resource	Develop the workflow engine and online "ask for leave" system	Extend the other applications for internal process	N/A
Data Exchange Gateway and EAI Backbone	N/A	Start the analysis for the architecture and requirements	Develop the data exchange gateway as pilot run	Extend the data exchange gateway and start the plan for EAI backbone



Government Contact Center	N/A	Plan and analyze the government contact center	Develop the government contact center with selected channels	Extend the service channels and quality
Online Training Project (E-Learning Project)	N/A	Plan and develop the online training system for government employees	Enhance the courses materials and integrate with the HR performance	Enhance the courses materials
Enhancing Compensation and Incentive Packages	N/A	Plan and analyze the requirements and gap and propose the package	N/A	N/A
Rebalancing Organization	Review and analyze the feasibility	Plan and propose the structure for e-Government management	N/A	N/A
Service Continuity Plan	Start from the individual system or case	Plan the overall e-government service continuity plan	N/A	N/A

7.1.3 Recommendation on E-Government development with international and regional cooperation

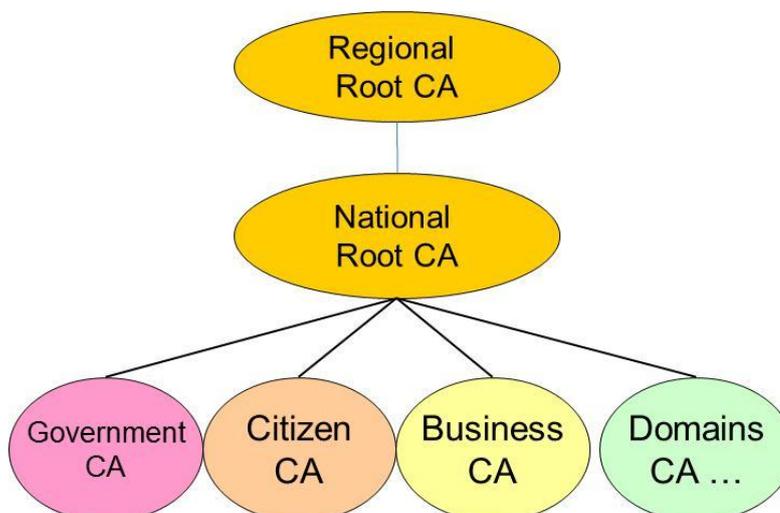
Since in the current status the SVG government has a lot of cooperation with the international and regional organization, there are few recommendations for this environment.

1. Form the task force for e-government development

As mentioned in this report, for the better management of the e-Government development and interoperability between g-Government services, to forming the high position task force or organization is a necessary action. The task force or organization is not only managing the development of e-Government but also evaluating the performance and the necessity of e-Government investment to reduce the redundant investments.

2. Leverage the regional architecture and develop the SVG own system

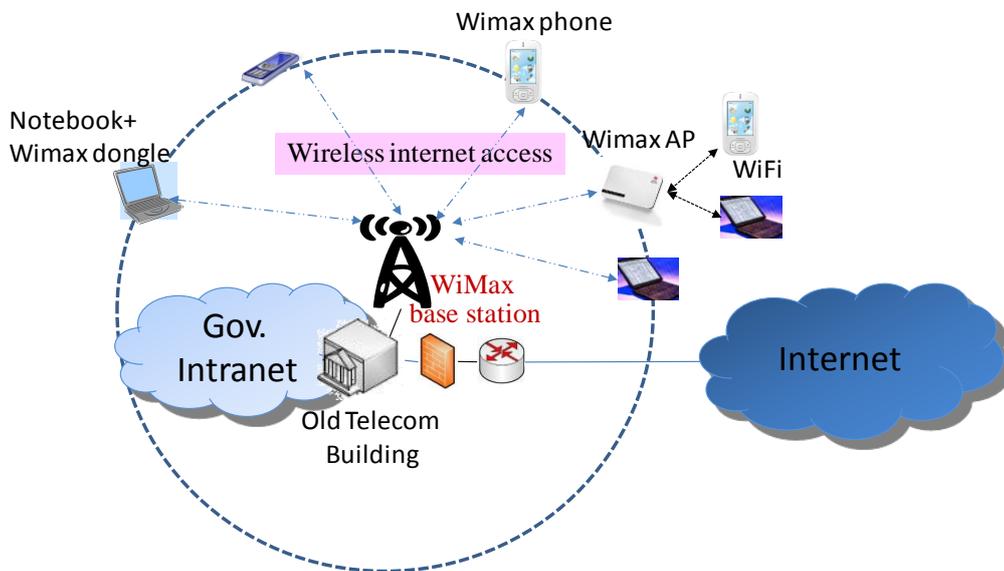
Based on the regional e-government development strategy and blueprint, there are many systems expected to be integrated with regional systems. However, there might be some differences requirements and structures in e-government services between SVG Government and other countries. Under this environment, it's suggested the SVG government can pay the attention on the "interchange interface" with the regional systems and can develop the domestic systems according to the individual requirements based on the regional interface. Take PKI for example, the regional strategies and standards must be followed but the national GPKI structure could be designed by SVG's environment and requirements.



7.1.4 Recommendation on SVG WiMax Network Implementation

WiMax is one of the 4th Generation (4G) communication technologies and it's widely used in the worldwide. It's suggested SVG government to implement the WiMax construction to realize the wireless network connection in government domains. The summary of the WiMax construction is as follows. The details are described in the "St. Vincent and the Grenadines e-Government Network Services Strategy Plan Report".

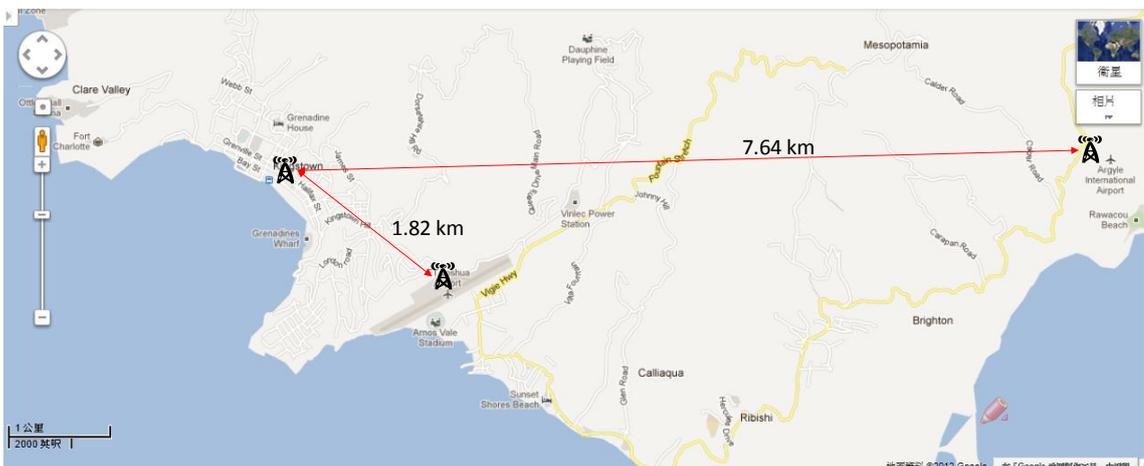
(A) The scenario of WiMax construction for government internet access service



(B) WiMax construction for government agencies connectivity

1. Connect to other agencies in St. Vincent

SVG government network is planning to connect to ET Joshua Airport and to Argyle International Airport (the new airport). The peer to peer WiMax backbone can be establish for connectivity.



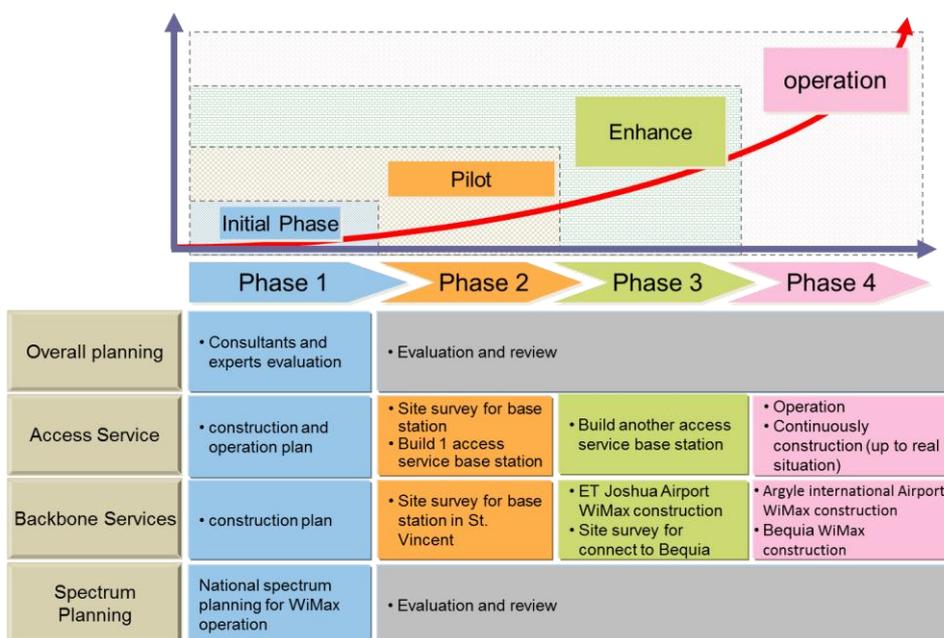
2. Connect to the Grenadines

The WiMax solution also can be used to connect to The Grenadine such as the Bequia Island. The linear distance between St. Vincent and Bequia Island is around 14 km. It is also within the coverage between 2 WiMax base stations. The WiMax base station can be established to connect 2 islands.

Of course, the accurate location of base stations, transit stations (if necessary) will be decided after real site survey.



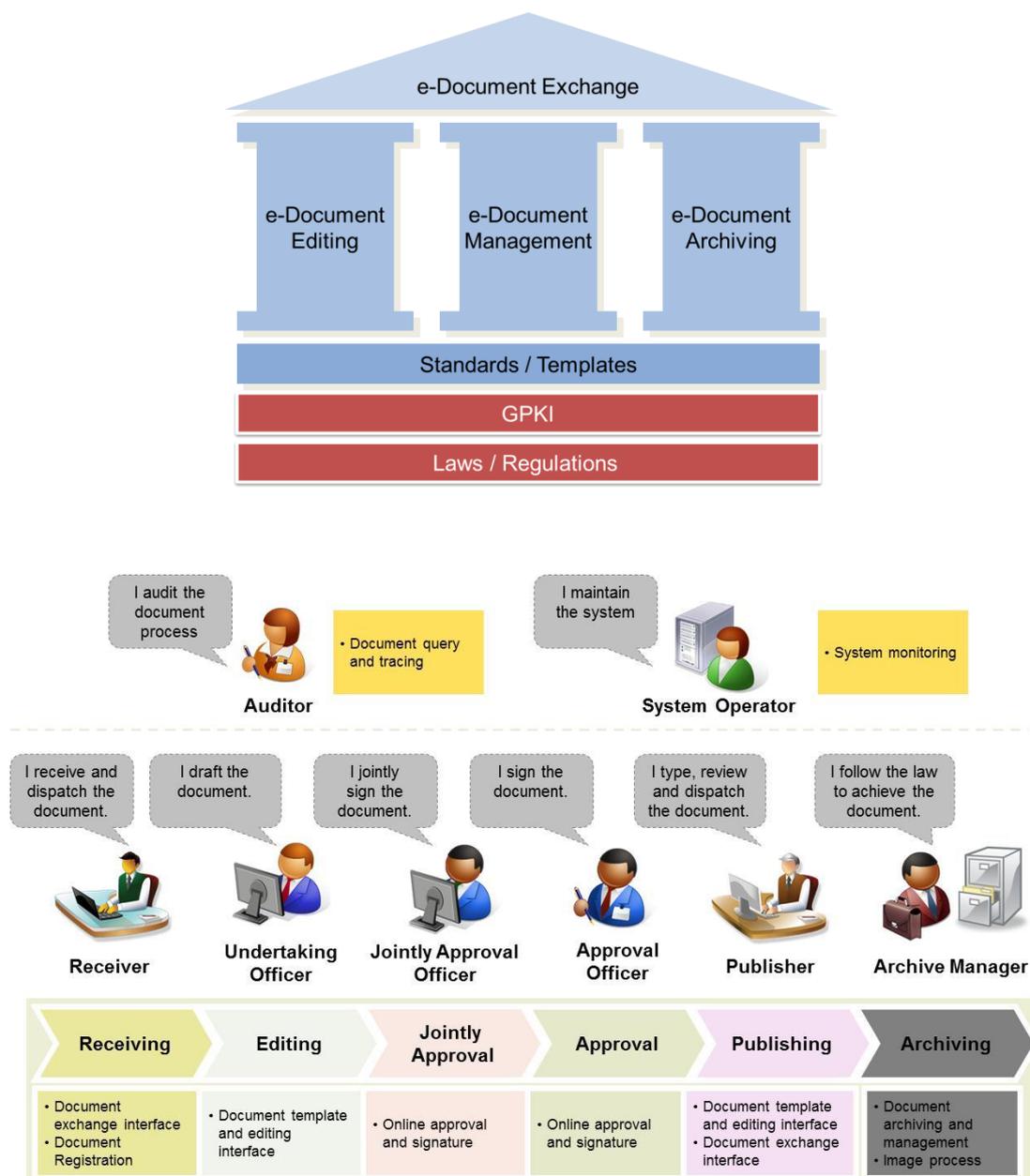
3. Schedule planning of WiMax construction project



7.1.5 Recommendation on E-Document Service Implementation

The e-document service in the government domain means transfer the official documents such as the letter, MEMO and contract into electronic process and storage. It helps the efficiency, accuracy and the convenience of the preparing, approval, searching and manage the official documents.

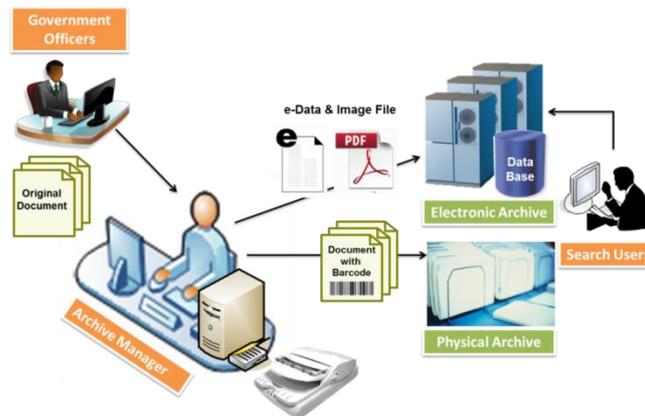
The e-document service includes the following scope and the editing and exchange are the major two systems in this application. The detailed description of each component is described in P.30 "5.1.5 E-Document Editing and Exchanging System"



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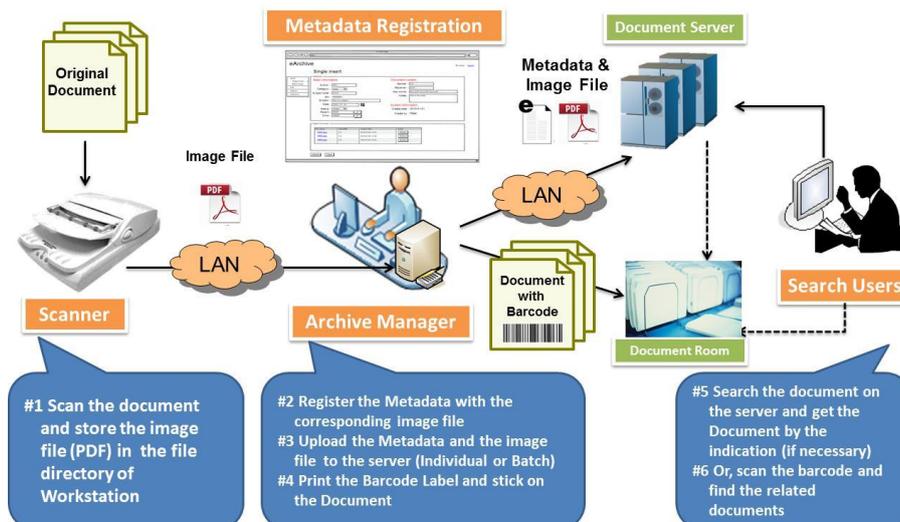
7.1.6 Recommendation on E-Archiving Implementation

E-document archiving system is a part of the e-Document service but also related to the file archiving field. The business scenario is as following figure.



The operation process of the e-document process is as following figure.

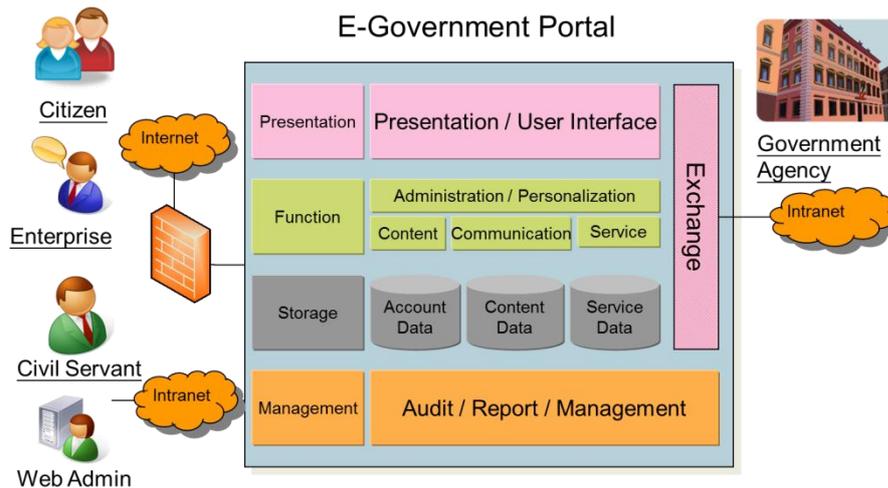
1. Scan the document and store the image file (PDF) in the file directory of Workstation
2. Register the Metadata with the corresponding image file
3. Upload the Metadata and the image file to the server (Individual or Batch)
4. Print the Barcode Label and stick on the Document
5. Search the document on the server and get the Document by the indication (if necessary), or
6. Scan the barcode and find the related documents



It's suggested the e-Document archiving system can be start in the selected government agencies as the pilot run and transfer to the other agencies by the successful experience.

7.1.7 Recommendation on E-Government Portal Implementation

As mentioned in this report, e-Government portal is the single window of the national users and also international users to access government-wide content, service and communication through different electronic channels. The proposed government portal for SVG Government has the following four-level structure, including presentation layer, function layer, storage layer and management layer.



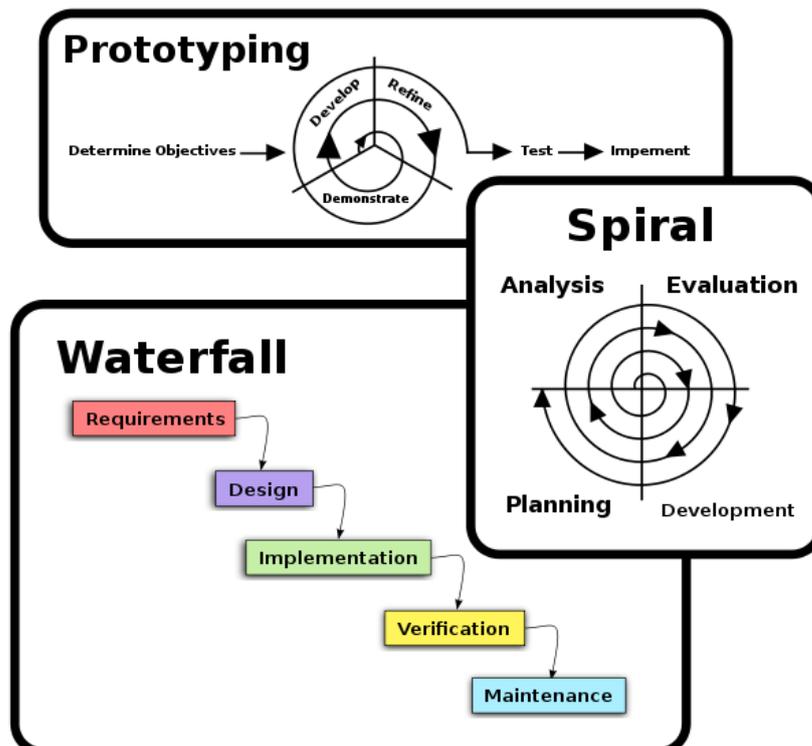
For the detailed information of the Portal, please refer to P.22- "5.1.1 E-Government Portal".

7.1.8 Recommendation on Development Methodology / Development Standard

For the following development of SVG e-government initiatives, it's necessary to select the proper development methodology and standard to increase the efficiency. There are several software development approaches have been widely used for different environment such as the follows and the suitable methodology for each initiative must be evaluated by the characters of the project. For example, the integration of national portal and intranet portal might be suitable for the Prototyping methodology for its requirements are not easy to be well-defined and could be change easily. The e-document archiving system may be suitable for Waterfall methodology because the project has clear objectives and solution.

The characteristic of each methodology are well-known now and can be easily refer to some introduction origins from public information such as Wikipedia website.

- Waterfall: a linear framework
- Prototyping: an iterative framework
- Incremental: a combined linear-iterative framework
- Spiral: a combined linear-iterative framework
- Rapid application development (RAD): an iterative framework
- Extreme Programming



Three software development patterns (from Wikipedia)

7.1.9 Recommendation on Collaborative Development

In terms of SVG e-government development, the purpose is not only to have the system and use the system but also to “own the system” and “utilize the system” by SVG government itself. Now the SVG government has shown the capability and determination to have the e-government services with fully ownership and leadership instead of using the license only. Regarding to the situation, Consultant puts the two major objectives on the balance and suggests the collaborative development model for future development and evaluates the solution choices as follows.



For the solution choices of the e-government services, there are two kinds of thinking with separated advantages and disadvantages. For cost and efficiency view, introduce a package software and apply some modification could be the easiest way to implement the system. However the ownership, the extensibility and the cost of transferring to other agencies may be worse than the new whole developed system. For some system development, especially the system is common requirements in the government agencies, it’s recommend SVG government can cooperate with the develop team as a “joint development” model to design the dedicated system and have knowledge transferring form the implementation team for future operation and extension.

	Package and Customization	Dedicated Design from Scratch
Cost of Implementation	V	Selected
Function completion	V	
Property ownership (Cost of maintenance)		V
Extensibility / Customizability		V
Ease of transfer and reduplicate		V

7.1.10 Recommendation on the Project Management

The project management is one of the key issues for the success of e-government development. There are many project management methodologies in software field and one of the famous methodologies is CMMI (Capability Maturity Model Integration). The CMMI now is popular in the IT field and widely adopted in the software development. It's suggested the SVG government should find the implementation team with the CMMI knowledge or certificate to ensure the implementation quality.

7.2 Conclusion and Key Success Factor for SVG e-Government Development

The end of this consulting project is just the start for long term e-Government development in SVG. In real practice, the e-Government development is usually an iteration process by implement and improvement. Therefore, in the following projects the most important issue will be the flagships of SVG government that guide the core components of SVG e-Government development.

To execute the objectives successfully, the following guiding principles are recommended. These principles should be integrated to the decision making process and implementation processes.

- Plan big, start small and scale up

The e-government development needs a big blueprint and framework to have better management and governance. In consultant's worldwide experience, the architecture of e-government will directly affect the success of e-government development. Due to the risk and resource issues, the best practice is to have an overall plan with a small pilot run and gradually extend the scale.

- Being ready to change

The e-government development will not only change the systems but also change the process, regulation and the citizen's expectation. Under the supports from e-government services, government can provide higher and faster services to citizens. The role of government employees should no longer be "waiting for service request" but should change to "how to serve the users actively". Actually, the most services are not provided by the systems but the government employees using the systems. Unless the employees change their minds, the e-government services will be successfully delivered to citizens.

- Right Person, Right Result

The e-government development is not only the government's business but also the involvement of system providers and other organizations such as the banks. The correct selection of the partners is the key of the success of implementation. It's necessary to leverage the teams with international experience and good project management capability to result in good achievements.

- User Involvement

To engage users from the very earliest stage and throughout the entire project will achieve more business benefits from the project. During the process, users should be encouraged to refine/reengineer the process rather than to continue the original way accomplished before. Users' perceptions should be measured to improve the quality of the IT services.