

St Maarten

St Maarten Digital Gov Transformation

Enterprise Architecture Inputs

November 2020



This document was prepared by Jerry Henzel (Consultant) in collaboration with Joanna Watkins, (Task Team Leader, Senior Public Sector Specialist) and Raman Krishnan, (Co-Task Team Leader, Senior Digital Development Specialist) as part of the Sint Maarten Digital Government Transformation Project (P171978, P172611). Funding was provided through the Sint Maarten Recovery, Reconstruction and Resilience Trust Fund administered by the World Bank. The document was drafted in close coordination with Sint Maarten's Ministry of General Affairs ICT Department.

Contents

Preface.....	3
Background	4
Chapter One: The Architectural Vision	5
Chapter Two: Architecture Maturity Assessment.....	8
Chapter Three: Organizational Model for Enterprise Architecture	19
Chapter Four: Architecture Principles	38
1.1 Digital by Default.....	39
1.2 “Once Only” & Data Minimization	40
1.3 Expectation of Privacy & Data Protection	41
1.4 Openness & Transparency	43
1.5 Security by Design	44
1.6 User-Centricity.....	47
1.7 Standard Government e-Services Digital Catalogue.....	48
1.8 Interoperable by Default	49
1.9 Government Data Exchange	50
Annex 1: Digital Transformation System Components.....	70
Annex 2: Roles and Responsibilities Matrix.....	71

Preface

This document forms part of the bank-executed portion of the Sint Maarten Digital Government Transformation Project (P171978) to support the Government of Sint Maarten in creating an enabling environment for digital transformation and preparing the groundwork for investments in ICT and system upgrades. The Digital Government Transformation Project is financed through the Sint Maarten Recovery, Reconstruction and Resilience Trust Fund administered by the World Bank.

In the absence of an adequate Enterprise Architecture (EA) in Sint Maarten, this document serves as a conceptual blueprint to determine the structure and operation of the government from an ICT perspective. The intent of the draft EA is to determine how the Government of Sint Maarten can most effectively achieve its current and future digital transformation objectives. The EA focuses on the technological, process and human resource dimensions of the GOSM's digital transformation. The EA sets the overall architecture for the ICT investments that will be procured under the recipient-executed project (P172611).

This is a deliverable under Pillar 2 on digital platforms. The objective of this pillar is to put in place the necessary technological infrastructure to facilitate the Government's digital transformation with a focus on the following:

- a. Digital payments
- b. System resilience
- c. IT system interoperability & data sharing

The Enterprise Architecture (EA) is organized in the following chapters. Chapter 1 presents the overall Architectural Vision. Chapter 2 contains the Architecture Maturity Assessment. Chapter 3 presents the organizational model for Enterprise Architecture and Chapter 4 contains the architectural principles.

Background

This document is the first of a series of documents that attempts to articulate a comprehensive and coherent approach that leads toward the development of a conceptual blueprint to determine the structure and operation of the government from an ICT perspective. It also serves to inform the activities of the Sint Maarten Digital Government Transformation Project.

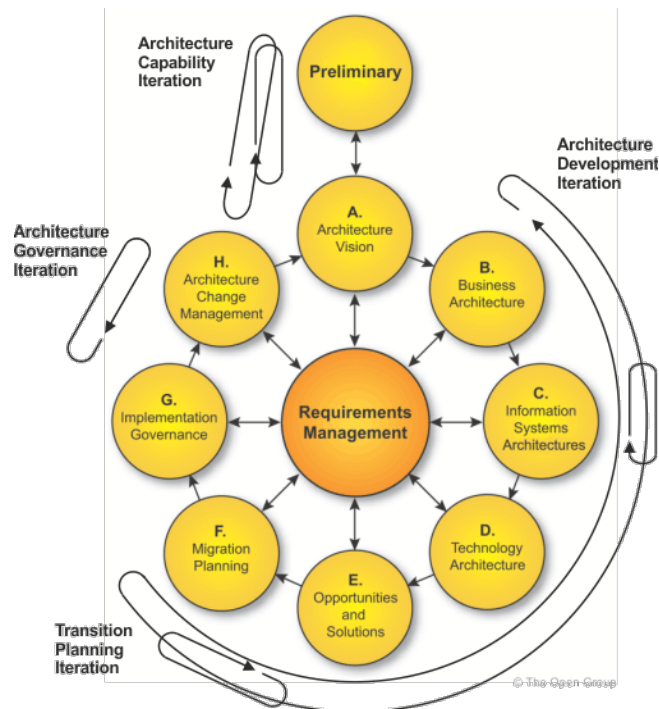
The focus here is on the core preliminary activities that are essential towards determining the business, information systems and data architectures; and subsequently, the implementation of the transformation itself. To arrive at these there needs to be an understanding of the maturity of the organization and its capacity to undertake the reforms proposed, a clear understanding of the business goals and drivers pushing transformation and reform, an accounting of all stakeholders and the impacts that they will be subject to and a clear delineation of the architectural vision and the principles that it is based on. This document attempts to lay a foundation for the development of the business, information systems and data architectures.

Enterprise Architectural Methodology

The Enterprise Architecture framework selected for Sint Maarten is the Open Group Architecture Framework (TOGAF) which provides an approach for designing, planning, implementing, and governing an enterprise information technology architecture. While TOGAF is broad and extensive, it has been scoped down to meet the needs of a government the size of Sint Maarten. Implementing a full TOGAF in Sint Maarten would be overwhelming given the resources available.

There are numerous ways to approach TOGAF. In Sint Maarten, specifically, the Application Development Method (ADM)¹ will be the approach used to realize this EA. See Figure 1. The ADM is meant to be both cyclical and iterative. This is a very well-documented approach that has been time

Figure 1: Application Development Method



¹ <https://pubs.opengroup.org/architecture/togaf8-doc/arch/chap03.html>

tested and very amenable to a wide variety of environments.

At the apex of TOGAF is architectural capability. This is where the goals and drivers, the architectural principles and vision are assessed and determined, etc. Within ADM, an organization may have to return back to this phase and iterate if individual projects are requiring or indicating changes to the broad landscape, new goals and drivers are introduced, etc.

Chapter One: The Architectural Vision

The culmination of the work presented below is the derivation of an architectural vision that is grounded in reality and founded on sound technology principles. See Figure 2 for a high-level overview of the architectural vision for the Government of Sint Maarten. This vision is designed to be a living document that serves as a blueprint for future activities. Given the iterative nature of the ADM, it is subject to revision as new projects come on-line and new realities of managing ICT across government in Sint Maarten arise. It is presented at the start of this document to give the reader a comprehensive overview. Subsequent sections serve to illustrate the supporting pillars and justification underpinning this vision.

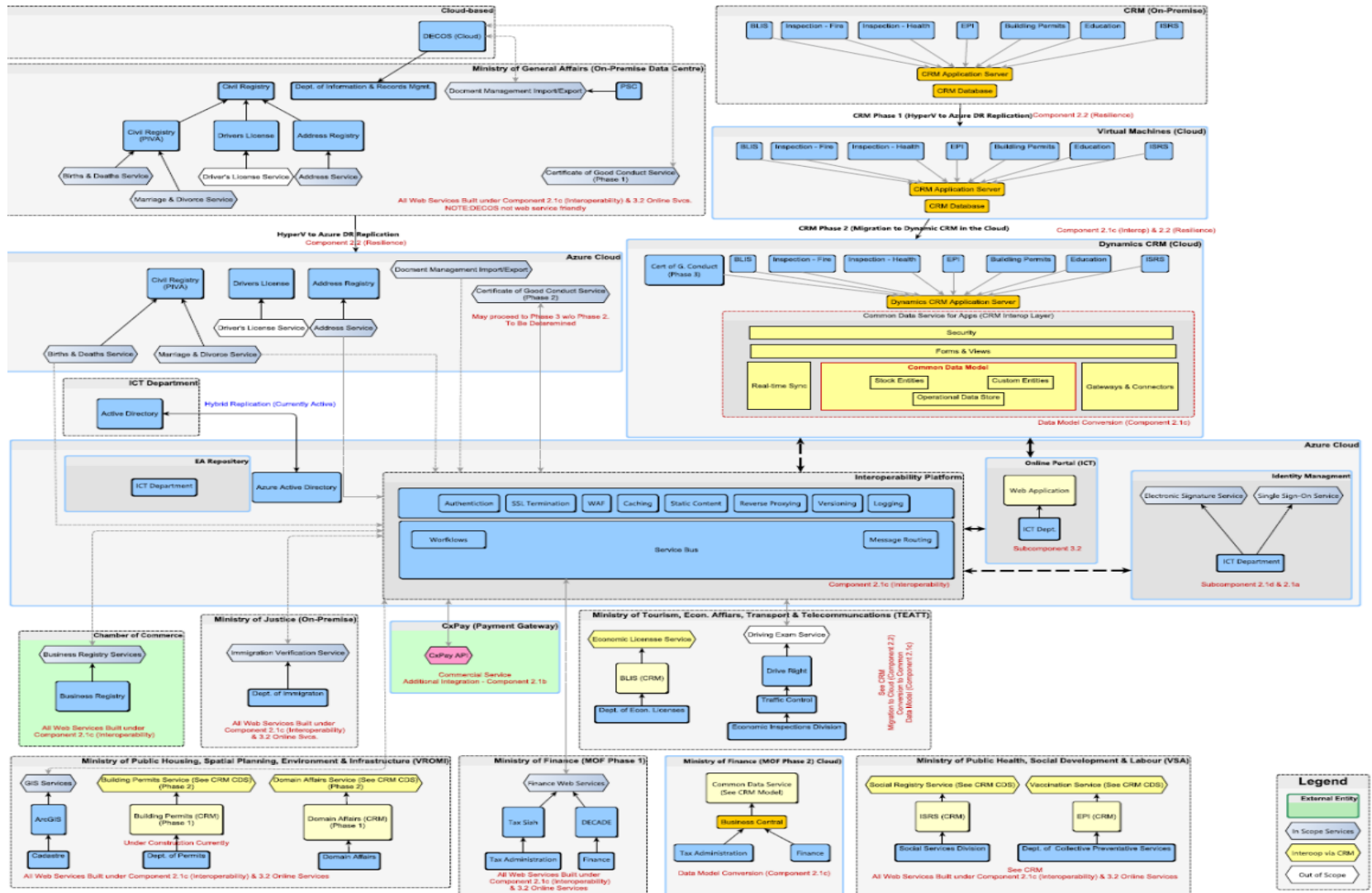
A number of defining characteristics can be noted in the vision:

1. Central to digital transformation in Sint Maarten is a scalable, flexible and secure data interoperability mechanism that serves as a common connection point for all data flowing across the government landscape.
2. A key feature of this interoperable layer is information security. Connections to and from this layer are secure by default during all transmission of data with appropriate levels of authentication and authorization.
3. The interoperability layer enforces the concept of a “single source of truth.” The idea that data are not replicated across government but that a single entity is identified as an authoritative owner of that data and that all other entities shall use that source vs. copying it to their own systems.
4. Identity management is linked to existing Government identity management systems and the end-user (whether citizen or civil servant) is presented with a single sign-on mechanism.
5. With a single source of truth principle, data will need to be exposed for other Ministries and potentially private entities to use. This will be done using open-source standards that facilitate interoperability and avoid vendor lock-in.
6. The vision will leverage the existing work on the common data model that the Government of Sint Maarten has implemented based on existing technology. This

existing data model already has a high degree of interoperability due to the common database it shares. However, many government entities are not on this system and have other constraints/requirements that this common database cannot meet. The proposed interoperability layer will work together with the existing common data model to facilitate the flow of information.

7. A number of seminal services will be built that can and will be shared across all government entities. This includes identity (single sign on), electronic signature and electronic payment. The end goal is to identify and expose services that are common to most or all entities so that each Ministry does not have to recreate and maintain the proverbial wheel.
8. The vision includes a single point of entry (portal) for all citizens where they will be able to access services using their single sign-on identifier, request and pay for services.
9. Data privacy and protection shall be a core concept.
10. Resilience will be achieved using cloud-first cloud-native computing.

Figure 2: Architecture Vision



Chapter Two: Architecture Maturity Assessment

The Architecture Maturity Assessment was undertaken to assess the Enterprise Architecture (EA) maturity of the Government of Sint Maarten. The assessment attempts to establish a baseline for the implementation of an enterprise architecture in order to provide guidance for future improvement. It delineates the areas critical to successful implementation of an enterprise architecture, offers a yardstick against which to measure future change, and offers a framework for that measurement.

Assessments of business processes within an organization are needed to evaluate an organization's current state, help determine where it needs to be headed and determine how ICT can help get there. The ultimate goal is to put a process in place that an organization can use to enhance its chances of success. In the private sector a number of maturity models have been developed to support and improve process improvement. The process maturity model most IT organizations use or base their models on is the Software Engineering Institute's (SEI) Capability Maturity Model for describing the evolution of software development processes.

This assessment will use the US Department of Commerce Architecture Capability Maturity Model (ACMM), which is based on SEI, to gauge the level of maturity of the enterprise architecture process in Sint Maarten. The ACMM was chosen in part due to its simplicity and conciseness. The ACMM delineates an evolutionary way to improve the overall process that starts out in an ad hoc state, transforms into an immature process, and then finally becomes a well-defined, disciplined, and mature process. It is relatively simple to implement and not overly complex in its approach thereby lending itself to easy repeatability. For a resource-constrained environment like Sint Maarten where the ICT Department consists of 4 staff this is critical.

Architecture Capability Maturity Model (ACMM)

The Enterprise Architecture Capability Maturity Model consists of six maturity levels and nine architecture elements. The maturity levels are:

0. None
1. Initial
2. Under Development
3. Defined
4. Managed
5. Measured

Maturity levels show an overall level of enterprise architecture maturity. Guideline specifics are shown in the supporting chapter of this document (EA Maturity Levels and Characteristics).

The nine Enterprise Architecture Elements are:

1. Architecture Process
2. Architecture Development
3. Business Linkage
4. Senior Management Involvement
5. Operating Unit Participation
6. Architecture Communication
7. IT Security
8. Governance
9. IT Investment and Acquisition Strategy

Specific scoring criteria for the observed level of EA in Sint Maarten are provided below per element.

Maturity Elements Assessment

The following is the observed level of maturity in the Government as per ACCM process element. Items highlighted in bold indicate what was found at the time of assessment.

ICT Architecture Process

The maturity criteria for ICT Architectural Process are:

Score	Criteria
0 – No EA	Not established or does not exist
1 – Initial	Exists in ad-hoc or localized form or early draft form may exist. Some Enterprise Architecture processes are defined. There is no unified architecture process across technologies or business processes. Success depends on individual efforts.
2 – Developing	Being actively developed. Basic Enterprise Architecture Process program is documented based on Office of Management and Budget Circular A-130 and Department of Commerce Enterprise Architecture Guidance. The architecture process has developed clear roles and responsibilities.
3 – Defined	The architecture is well defined and communicated to IT staff and business management with Operating Unit IT responsibilities. The process is largely followed.
4 – Managed	Enterprise Architecture process is part of the culture, with strong linkages to other core IT and business processes. Quality metrics associated with the architecture process are captured. These metrics include the cycle times necessary to generate Enterprise Architecture revisions, technical environment stability, and time to implement a new or upgraded application or system
5 - Optimizing	Concerted efforts to optimize and continuously improve architecture process

At the EA level, currently the EA maturity is in its initial phases. There has been some ad-hoc work done by Computech for the Government, but this has not been presented in a formal fashion and appears largely to be anecdotal and ad-hoc.

ICT Architecture Development

The maturity criteria for ICT Architecture Development are:

Score	Criteria
0 – No EA	Not established or does not exist
1 – Initial	Enterprise Architecture processes, documentation, and standards are established by a variety of ad-hoc means and are localized or informal
2 – Developing	IT Vision, Principles, Business Linkages, Baseline, and Target Architecture are identified. Architecture standards exist, but not necessarily linked to Target Architecture. Technical Reference Model and Standards Profile framework established
3 – Defined	Gap Analysis and Migration Plan are completed. Architecture standards linked to Business Drivers via Best Practices, IT Principles, and Target Architecture. Fully developed Technical Reference Model and Standards Profile.
4 – Managed	Enterprise Architecture documentation is updated on a regular cycle to reflect the updated Enterprise Architecture. Business, Information, Application and Technical Architectures defined by appropriate de-jure and de-facto standards. An automated tool is used to improve the usability of the architecture.
5 - Optimizing	Defined and documented Enterprise Architecture metrics are used to drive continuous process improvements. A standards and waivers process is used to improve architecture development process improvements

Currently it appears that Sint Maarten is at Level 0 as there is no formal EA. However, what does exist largely operates at Level 1 where efforts are localized and informal. Projects are done individually often with a Vendor. Some Ministries, e.g. Justice are outside of the existing process. There is some attempt informally to make Microsoft Dynamics CRM a key platform across government and establish it as a standard but the efforts are not formal.

Business Linkage

The maturity criteria for Business Linkage are:

Score	Criteria
0 – No EA	No linkage to business strategies or business drivers
1 – Initial	Minimal, or implicit linkage to business strategies or business drivers
2 – Developing	Explicit linkage to business strategies

3 – Defined	Enterprise Architecture is integrated with capital planning and investment control and supports e-government. Explicit linkage to business drivers and information requirements
4 – Managed	Capital planning and investment control are adjusted based on the feedback received and lessons learned from updated Enterprise Architecture. Periodic re-examination of business drivers
5 - Optimizing	Architecture process metrics are used to optimize and drive business linkages. Business involved in the continuous process improvements of Enterprise Architecture

The linkages to business strategies and drivers that exist are on a project and local level only. There does not appear to be a whole of government approach to defining business strategies formally and linking ICT to those strategies.

Senior Management Involvement

The maturity criteria for Senior Management Involvement are:

Score	Criteria
0 – No EA	No support from senior executives. Status quo is actively defended
1 – Initial	Limited management team awareness or involvement in the architecture process
2 – Developing	Management awareness of Architecture effort. Occasional, selective management team involvement in the architecture process with various degrees of commitment/ resistance
3 – Defined	Senior-management team aware of and supportive of the enterprise-wide architecture process. Management actively supports architectural standards.
4 – Managed	Senior management reviews architecture and variances
5 - Optimizing	Senior-management team directly involved in the optimization of the enterprise-wide architecture development process and governance

Within the ICT Department there is Senior Management involvement. However, more broadly at the level of the Secretaries General there appears to be interest and involvement but that varies project by project and definitely not on a whole of government EA level.

Operating Unit Participation

The maturity criteria for Operating Unit Participation are:

Score	Criteria
0 – No EA	No part of Operating Unit participates or is involved with Enterprise Architecture process
1 – Initial	Limited Operating Unit acceptance of the Enterprise Architecture process. Support exists only to the extent that the architecture process maintains the status quo

2 – Developing	Enterprise Architecture responsibilities are assigned, and work is underway. There is a clear understanding of where the organizations architecture is at present time. Recognition that it is costly supporting too many kinds of technologies
3 – Defined	Most elements of Operating Unit show acceptance of or are actively participate in the Enterprise Architecture process. Recognition that architectural standards can reduce integration complexity and enhance overall ability to Operating Unit IT to achieve business goals
4 – Managed	The entire Operating Unit accepts and actively participates in the Enterprise Architecture process
5 - Optimizing	Feedback on architecture process from all Operating Unit elements is used to drive architecture process improvements

For the purposes of this discussion, the Operating Unit (business unit) shall be defined as the recipient or target Ministry or Department. Currently it does not appear that any business units are involved in any broader architectural effort. Efforts appear to be ad-hoc and project focused which reinforces the silo-like nature of the current situation.

Architecture Communication

The maturity criteria for Architecture Communication are:

Score	Criteria
0 – No EA	None
1 – Initial	Little communication exists about the Enterprise Architecture process and possible process improvements. The Government Enterprise Architecture Web Page contains the latest version of the Operating Units Enterprise Architecture documentation
2 – Developing	The Operating Unit Architecture Home Page, which can be accessed from the Government Enterprise Architecture Web Page, is updated periodically and is used to document architecture deliverables. Few tools (e.g., office suite, graphics packages) are used to document architecture. Communication about architecture process via meetings, etc., may happen, but sporadic
3 – Defined	Architecture documents updated and expanded regularly on Government Enterprise Architecture Web Page. Tools are used to support maintaining architecture documentation. Periodic presentations to IT staff on Architecture content
4 – Managed	Architecture documents are updated regularly, and frequently reviewed for latest architecture developments/ standards. Regular presentations to IT staff on Architecture content. Organizational personnel understand the architecture and its uses
5 - Optimizing	Architecture documents are used by every decision maker in the organization for every IT-related business decision-maker

There is nothing formally documented, and all communication appears to be project or Ministry focused at best.

IT Security

The maturity criteria for ICT Security are:

Score	Criteria
0 – No EA	No IT Security considerations in Enterprise Architecture
1 – Initial	IT Security considerations are ad hoc and localized
2 – Developing	IT Security Architecture has defined clear roles and responsibilities
3 – Defined	IT Security Architecture Standards Profile is fully developed and is integrated with Enterprise Architecture
4 – Managed	Performance metrics associated with IT Security Architecture are captured.
5 - Optimizing	Feedback from IT Security Architecture metrics are used to drive architecture process improvements

While there is no formal EA, ICT security has come to the forefront after recent cyberattacks in Sint Maarten. However, there are no formal standards regarding ICT security that have been produced and the remedial actions taken, while good, are ad-hoc. It would be hard to say that there are defined and clear roles and responsibilities and standards.

Governance

The maturity criteria for Governance are:

Score	Criteria
0 – No EA	None. Funding is the sole decision point for projects
1 – Initial	No explicit governance of architectural standards. Limited agreement with governance structure
2 – Developing	Governance of a few architectural standards (e.g. desktops, database management systems) and some adherence to existing Standards Profile. Variances may go undetected in the design and implementation phases. Various degrees of understanding of the proposed governance structure
3 – Defined	Explicit documented governance of majority IT investments. Formal processes for managing variances. Senior management team is supportive of enterprise-wide architecture standards and subsequent required compliance
4 – Managed	Explicit governance of all IT investments. Formal processes for managing variances feed back into Enterprise Architecture. Senior-management team takes ownership of enterprise-wide architecture standards and governance structure

5 - Optimizing	Explicit governance of all IT investments. A standards and waivers process is used to improve architecture development and governance - process improvements
----------------	--

At this time funding appears to be a major constraint in Sint Maarten with decisions being made on that basis.

IT Investment and Acquisition Strategy

The maturity criteria for ICT Investment and Acquisition are:

Score	Criteria
0 – No EA	No regard for Enterprise Architecture in formulation of strategic IT acquisition strategy by Operating Unit
1 – Initial	Little involvement of strategic planning and acquisition personnel in enterprise architecture process. Little or no adherence to existing Standards Profile
2 – Developing	Little or no formal governance of IT Investment and Acquisition Strategy. Operating Unit demonstrates some adherence to existing Standards Profile
3 – Defined	IT acquisition strategy exists and includes compliance measures to IT Enterprise Architecture. Operating Unit adheres to existing Standards Profile. RFQ, RFI and RFP content is influenced by the Enterprise Architecture. Acquisition personnel are actively involved in Enterprise Architecture governance structure. Cost-benefits are considered in identifying projects
4 – Managed	All planned IT acquisitions are guided and governed by the Enterprise Architecture. RFI and RFP evaluations are integrated into the Enterprise Architecture planning activities.
5 - Optimizing	Operating Unit has no unplanned IT investment or acquisition activity.

At this there is no EA and all decisions are made by the business units as per their best interests.

Maturity Assessment Summary

At the broad EA maturity level, there is currently no formal EA in place in Sint Maarten. There have been some informal efforts to develop some elements of what may constitute to be an EA in Sint Maarten. The ICT Department has worked with a local vendor, Computech that claims to have done an EA assessment and developed a digital services catalogue. There is no formal written evidence of same at this point. This indicates that Sint Maarten is operating at Level 0 maturity level.

The criteria for broad level EA maturity, Level 1 – Initial EA as per the ACMM were also reviewed to determine if Sint Maarten showed any signs of Level 1 maturity activity.

The full criteria to be at Level 1 of ACMM EA Maturity are:

1. Processes are ad hoc and localized. Some Enterprise Architecture processes are defined. There is no unified architecture process across technologies or business processes. Success depends on individual efforts.
2. Enterprise Architecture processes, documentation, and standards are established by a variety of ad hoc means and are localized or informal.
3. Minimal, or implicit linkage to business strategies or business drivers.
4. Limited management team awareness or involvement in the architecture process.
5. Limited Operating Unit acceptance of the Enterprise Architecture process.
6. The latest version of the Operating Unit's Enterprise Architecture documentation is on the Web. Little communication exists about the Enterprise Architecture process and possible process improvements
7. IT Security considerations are ad hoc and localized.
8. No explicit governance of architectural standards.
9. Little or no involvement of strategic planning and acquisition personnel in enterprise architecture process. Little or no adherence to existing Standards Profile.

After an examination of the above criteria for Level 1 maturity (Initial - Informal Enterprise Architecture Process Underway), it is clear the ICT Department still heavily depends on individual efforts with most processes being ad-hoc and localized. The management team (ICT) has some awareness and involvement in the broader architectural process but there is no documentation formally published, nor explicit standards. In the current state it would be hard to conclude that Sint Maarten is functioning at Level 1 maturity, despite having a few signs of moving towards that direction. Sint Maarten is functioning at Level 0 maturity.

A second level of EA maturity was also examined in the ACMM to provide further detail. This level attempts to determine specific EA maturity characteristics. These are:

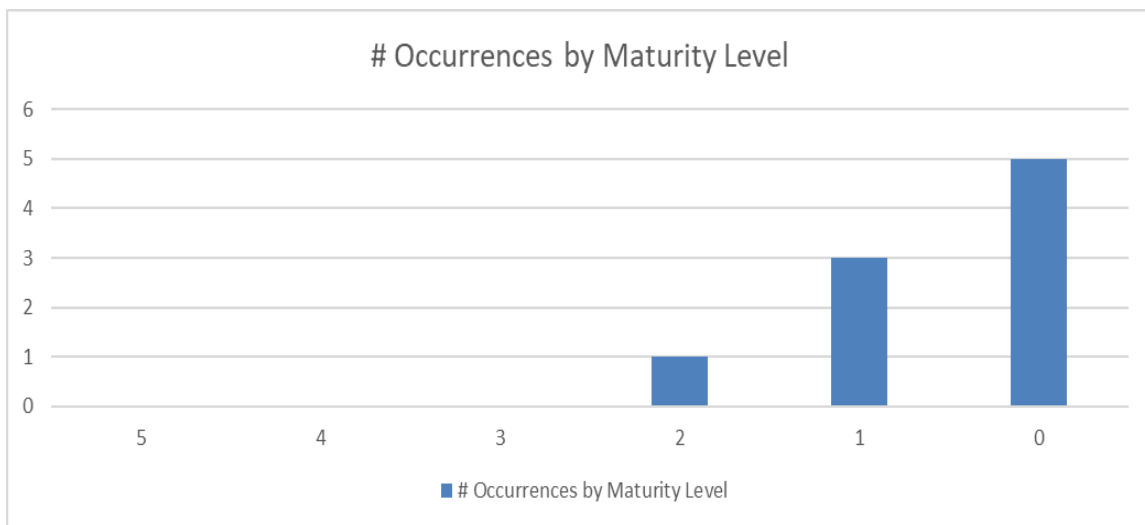
1. Architecture Process
2. Architecture Development
3. Business Linkage
4. Senior Management Involvement
5. Operating Unit Participation

6. Architecture Communication
7. IT Security
8. Governance
9. IT Investment and Acquisition Strategy

The results are presented below:

Maturity Element	Score
Architecture Process	1
Architecture Development	1
Business Linkage	0
Senior Management Involvement	2
Operating Unit Participation	0
Architecture Communication	0
IT Security	1
Governance	0
IT Investment and Acquisition Strategy	0

Maturity Level	# of Occurrences at Each Level	%
5	0	0
4	0	0
3	0	0
2	1	11.1
1	3	33.3
0	5	55.5



It is clear that at this point in time Sint Maarten is at the beginning of its EA journey. There are some promising areas where at least there is awareness and some movement towards

an EA and the best practices of an EA. There does appear to be some involvement at the Senior Management level, especially at the Ministry level but that needs to be expanded more broadly and across the whole of government. The small size of the ICT Department is a bit of an advantage, and disadvantage. It is an advantage simply because the idea of a whole of government architecture is vested in one individual who appears to have a holistic view of the ICT architectural and development process. However, this is also its main disadvantage.

There is currently a significant gap in both the architecture process and architecture development phases. Most of the work is ad-hoc and any architecture or standards are purely informal. Furthermore, the Ministry of Justice is removed from the day-to-day oversight of the ICT Department potentially leading to a very serious gap and discontinuity between them. The following general observations can be made:

1. Linkages to business goals and drivers are fundamentally weak in a whole of government perspective. They tend to focus on the project level and, even within a Ministry, may not take a Ministry-wide approach. This tends to leave projects and Ministries working in siloes with poor sharing of data. Data that is shared is often done via an extract-transform-load (ETL) method resulting in multiple copies of the same data that eventually goes out of sync.
2. From an enterprise architecture perspective, operating units, i.e. business recipients, are not involved in any sort of broad whole of government approach to architecture.
3. Governance of ICT is fractured between the ICT Department and the Ministry of Justice. Excluding the Ministry of Justice, the ICT Department does its best to maintain standards and governance with the few resources they have.

Overall ICT investment is focused mostly on individual projects and driven by the desire of Ministries rather than a whole of government approach

Recommended Resolution Approach

Given the identified gaps, the following actions are recommended to increase maturity levels. These are:

1. Initial assessments have shown that not only is there no interoperability framework for the agencies to follow and there is no mechanism to mandate the use of standardized processes and procedures guiding investments in digital transformation projects in the government. The Government should establish governance and institutional structures for digital government transformation including the creation and operationalization of a special government executing unit for these purposes. The Unit should be created by national decree to manage the technical implementation and project management duties of the whole project. It will also oversee and coordinate the operations and management of Digital Transformation initiatives in Sint Maarten. The Unit shall have the power to convene relevant stakeholders from different ministries and departments to generate consensus based on standard operating procedures and principles guiding digital transformation. The Unit will also be able to create special-purpose inter-ministry

committees and coordination mechanisms to reach consensus on policy and system decisions, for example on cyber-security or data privacy.

2. Perform a whole of government Enterprise Architecture that will focus on technological, process, and human resource dimensions of the digital transformation. This EA should cover everyone including and especially the Ministry of Justice. It should be carried out using a recognized best-practice methodology and encompass governance, business process, data, application and technology architectures.
3. As a key part of the Enterprise Architecture to be completed, the Government must develop an interoperability framework as key policy to break down silos that hinder data sharing, result in data quality issues and increase workload of staff.

Chapter Three: Organizational Model for Enterprise Architecture

Scope of Organizations Impacted

The initial EA will focus on a key subset of entire Government of Sint Maarten. This subset will be detailed below. It will also be focused on the provision of 6 key digital services that have been fast-tracked and prioritized by the Government. These are:

- Certificate of Good Conduct
- Change of Address
- Registration of a Death, Divorce or Marriage
- Building Permit Application
- Economic Licenses
- Request for Vaccination Record.

It is important to note that the ADM process is iterative in nature and part of a continuous improvement cycle. The documents, procedures, standards, etc. that it produces in each cycle will be housed in an Enterprise Repository that will act as the final and authoritative source for these items.

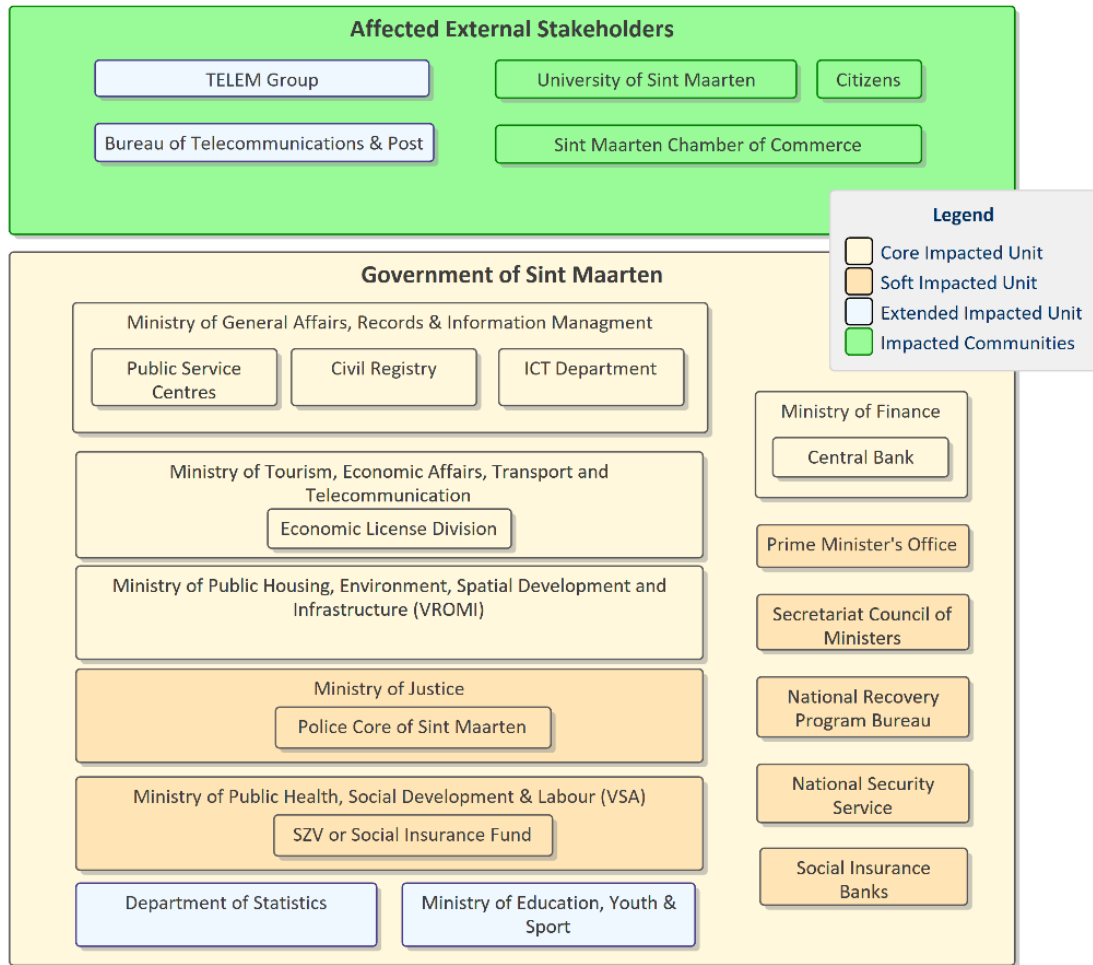
The following organizations are impacted by the Enterprise Architecture. The level of impact is categorized using the following criteria:

Core impacted units: The most affected and achieve the most value from the work.

Soft impacted units: Change may affect their capability and work with core units but are otherwise not directly affected.

Extended impacted units: Outside of the scoped enterprise and will be affected in their own enterprise architecture.

Impacted communities: Will be affected and are in groups of communities.



Description of Impacts

Each of the identified organizations were examined to determine the nature and type of impact they were expected to experience. These are presented below.

Organization Unit	Description of Impact
Citizens	<p>The primary direct beneficiaries will be citizens and businesses in Sint Maarten that will benefit from more efficient, higher quality, resilient public services, faster response times to complaints and feedback, and comprehensive digital literacy programs.</p> <p>Vulnerable groups will also be impacted. This includes beneficiaries such as women single headed households and women workers and citizens who</p>

Organization Unit	Description of Impact
	<p>are not able to access the Public Service Centres. These groups will benefit from online access as will citizens and businesses who cannot afford intermediary services to process paperwork for specific services such as the certificate of good conduct, request for vaccination records, address change, registration for basic life milestones.</p>
Civil Servants	<p>Civil servants will benefit from this project through streamlining of essential business processes that will enable them to deliver public services with speed, higher levels of quality, and efficiency.</p> <p>The capacity of the public servants in various agencies across the government should improve in terms of data sharing and flow of information with better coordination between agencies.</p> <p>Some civil servants may be asked to assume new roles or have their existing roles redefined.</p>
Ministry of General Affairs - Civil Registry	<p>The Civil Registry will be among the most significantly impacted body. It is the holder of the key information store in the government and is responsible for maintaining all the personal data for the population of Sint Maarten.</p> <p>A major impact will be the clean-up of the Civil Registry data store and de-duplication of data where needed, development and implementation of a unique identifier (UIN) that is secure and protects from identity fraud.</p> <p>The data within the Civil Registry will be accessible via a programmatic interface, e.g. API, web service, etc. to other systems and Ministries thereby reducing the need to copy and duplicate data across system boundaries which results in data quality issues and extra work for staff.</p>
Ministry of General Affairs - Public Service Centres	<p>Public Service Centres (PSC) are a department within the Ministry that aims to be a 'one-stop-shop' of services to citizens. It is the primary interface through which the citizen interacts with the Government for service delivery.</p>

Organization Unit	Description of Impact
	<p>There will be an impact on public service delivery in Sint Maarten by transforming and scaling-up the existing Public Service Centres to include additional services offered through multiple channels.</p> <p>Advances in technology will promote interactions through multiple channels, both digital and physical and, in turn, afford citizens and businesses improved access to the government.</p> <p>Existing Public Service Centres located in Philipsburg and Simpson Bay will enhance their operations by upgrading the IT and organizational arrangements for service delivery.</p> <p>The resilience of Public Service Centre operations will be impacted by establishing standard operating procedures to be adopted by various service delivery units within the Public Service Centre during normal times and in the wake of disasters.</p> <p>Upgrades to the Public Service Centres will be focused on improving the usability and user-centricity of the centres in both Philipsburg and Simpson Bay. Through the separation of front office service delivery from back office administrative functions, the Centres will offer government services from multiple ministries and agencies.</p> <p>In addition, there will be impact through the update of the physical layout to allow for more service windows and purchasing of new furniture to accommodate more guests more comfortably. Other minor refurbishments to improve the overall functioning of the PSC will include updating the paint, signage, kiosks, and security aspects.</p>
Telem Group	<p>The Sint Maarten Telecommunication Holding Company N.V. (Telem Group) is a government-owned telecommunications company. Telem provides a complete range of telecommunication services to residential and business clients, as well as visitors to Sint Maarten including the Government.</p>

Organization Unit	Description of Impact
	<p>Telem maybe be impacted both directly and indirectly. Directly, Telem has been approached to provide dark fibre for a parallel government wired wide area network. This would have a major impact on Telem if it comes to fruition.</p> <p>Indirectly, Telem will also benefit from this project in the form of more usage and demand for its telecom infrastructure and services as more of the government & citizens move to digital services.</p>
University of Sint Maarten	<p>The University of Sint Maarten works in collaboration with the Sint Maarten Chamber of Commerce and the business community to enhance employment opportunities for youth in the country.</p> <p>Their impact will be limited to their role in training and developing citizens with the requisite skills to function in an increasing digital society. As digital services take hold and usage of them spreads there will be a greater demand on digital literacy. This includes digital literacy in the sense of both using services but also in the skill set needed to both develop new services and to maintain existing services without having to bring in foreign experts as often happens currently.</p>
Sint Maarten Chamber of Commerce	<p>The Sint Maarten Chamber of Commerce and Industry (COCI) is the Trade Registry for Sint Maarten. It registers all businesses seeking to be operational in Sint Maarten in cooperation with the Government.</p> <p>The impact on COCI will occur as more digital services at the Government level are brought online. COCI will have to make adaptations. For example, digital payment and a single sign-on system will or should be integrated into their current online registration site. Failing to do so will create extra friction for the citizen and potentially extra work for the Government as they strive to become more efficient.</p>

Organization Unit	Description of Impact
Ministry of General Affairs - ICT Department	<p>The Department of ICT is under the Resources and Support function of the Ministry of General Affairs.</p> <p>The effect on the Department will be very significant. The Department will be asked to support a greater number of digital services and underlying support systems and potentially develop new services or contract/outsource them.</p> <p>From a resilience perspective, they will be tasked with developing a mirror set of systems in the cloud that will increase their workload and the skill set needed. The overall support workload will increase greatly.</p>
Ministry of Tourism, Economic Affairs, Transport and Telecommunication	The planned interoperability platform may impact TEATT since it will remove the need to copy data from other Ministries via the extract-transform-load (ETL) process thereby reducing workload and improving data quality. Existing applications may need to be modified to take advantage of this functionality.
Ministry of Tourism, Economic Affairs, Transport and Telecommunication - Department of Statistics	The Department should have much greater access to data with improved data quality after successful implementation.
Ministry of Tourism, Economic Affairs, Transport and Telecommunication - Economic License Division	The Economic License Division is in the process of launching a mobile application that permits a citizen to initiate the economic license process via a mobile app by uploading a variety of documents needed for the process. Users are expected to sign with an e-signature and currently there is no payment capability in the app. The planned payment and digital identify services will impact the application as might the interoperability platform.
Ministry of Public Housing, Environment, Spatial Development and Infrastructure (VROMI)	The main application and platform located at VROMI is the geospatial database. This is a commercial software product from Environmental Systems Research Institute, commonly known as ESRI, using ArcGIS Server Enterprise 10.7 supporting 80 internal users and one external. It is located at the main Government Data Centre and

Organization Unit	Description of Impact
	<p>there are currently no real-time interfaces with any other systems within the government.</p> <p>The interoperability platform will have an impact on this database as it will permit real-time connections to the spatial database. These must be built and constructed where needed. In some cases, VROMI might want to tap into other services exposed via the interoperability platform including electronic payments or digital identity for their own use.</p>
<p>Ministry of Public Health, Social Development and Labor (VSA) - SZV or Social Insurance Fund</p>	<p>The primary application platform in use at VSA is the same Microsoft Dynamics CRM instance that is used in the Ministry of General Affairs. It has some interoperability built in.</p> <p>The official document management application (DECOS) may be impacted by the project and current initiatives involving Microsoft Dynamics CRM. There does not appear to be any real-time data exchange with any other systems and Dynamics CRM other than AFIS. Any data exchange between DECOS and other systems appears to be either import/export or via extract-transform-load mechanisms. An interoperability platform could alter this dramatically for both CRM and DECOS.</p> <p>A new “social registry” management information system is being planned by the Ministry and is in the early stages of planning and development. The Integrated Social Registry System (ISRS) is an information system that helps organize and analyze raw data pulled from the various social services and programs and turn it into useful information that can be used to support decision making and ultimately deliver the right service to the right individual at the right time. Currently all data exchange is planned to be via extract-transform-load, i.e. copy. An interoperability platform could alter this dramatically.</p>
<p>Social Insurance Banks</p>	<p>The Social Insurance Banks need access to the Civil Registry Department for records of persons deceased or no longer living on the island.</p>

Organization Unit	Description of Impact
	Further, the Banks will need to work with the Ministry of General Affairs Department of Personnel Affairs to manage the sickness and leave administration for civil servants.
Ministry of Justice - Police Corp of Sint Maarten	The Police have ultimate responsibility for issuance of Driver's Licenses even though the majority of front-end work is done at Public Service Centres, i.e. the application process. Electronic payment and digital identity will have major impact on this process as will online service delivery.
Prime Minister's Office (PMO)	The PMO is the ultimate decision-making body in Sint Maarten. The impact of all activities will eventually impact this office.
Secretariat Council of Ministers	The Council is a secondary decision-making body after the PMO. The impact of all activities will eventually impact this office.
National Recovery Program Bureau (NRPB)	The NRPB will act as the main implementer of the project and be responsible for monitoring and evaluation, coordination, financial management, contract management, fiduciary support, safeguards and building the capacity to support a governance body for the EA.
National Security Service	Any improvements that involve information security will have impact on national security in some selected instances.
Ministry of Finance	<p>A key system in the Ministry is Decade, a commercial software commissioned in 1997 with 10 users using client-server technology and used for financial management. It interfaces with GEFIS - the country's integrated financial management information system via manual import/export. It should interface with most other systems that have payment implications. An interoperability platform may have impact on this mechanism of data exchange.</p> <p>There is an internal discussion within the ICT department to move to Microsoft Dynamics Nav from GEFIS. The Ministry also uses DECOS and</p>

Organization Unit	Description of Impact
	<p>Tax Siah; a custom-built solution from Bearing Point commissioned in 1994 with 60 users for tax assessment. The latter interfaces with GEFIS using manual import and export. An interoperability platform may have impact on this mechanism of data exchange.</p> <p>More broadly, an interoperability platform could reduce manual copying of data and permit real-time data exchange.</p> <p>An electronic payment system may also impact the Ministry significantly by altering the flow of money and reducing manual processing.</p>
Ministry of Finance – Central Bank	The Central Bank is currently planning an electronic payments system. This payment system will have a major impact on all digital services that have payment options. The chief impact on the Central Bank’s system is that the planned digital services with electronic payment options will need to be integrated.
Bureau of Telecommunications and Post	The Bureau deals with the policies and legislation in the telecom sector. It may have to play a role in any policies that may be related to telecommunications and Internet connectivity.
Ministry of Education, Culture, Youth and Sport	<p>The effects on this Ministry will be on the programs it develops and delivers as it relates to digital literacy both to enable citizens to use digital services and to develop skill sets to work in technology.</p> <p>The Ministry also has an online application portal that appears to be running on the Apache web server on the Ubuntu operating system. The latter should interface with both the Taxation and Civil Registries since students have to meet certain criteria to apply. The interoperability platform will impact this.</p>

Roles and Responsibilities (RACI)

One of the major aims of the preliminary phase of the TOGAF ADM is to determine the viewpoints and artefacts that are important in the context of an enterprise. Stakeholders

participating in enterprise architecture work must therefore be identified. Once identified their roles and responsibilities must be codified relevant to the enterprise architecture.

One formal method of codification is the RACI Responsibility Matrix technique, i.e. Responsible, Accountable, Consulted and Informed. Specifically:

- **RESPONSIBLE:** Person(s) responsible for doing the work
- **ACCOUNTABLE:** Person accountable for signing off the work
- **CONSULTED:** Person consulted before and during task
- **INFORMED:** Person informed of work progress/completion

For this analysis functional roles were used in place of individual stakeholders, primarily due to the fluid nature of the government and the rate of change personnel have in their roles there.

The final RACI analysis can be found at the end of this document.

Constraints

Constraints are external elements that influence the system, sometimes restraining its capacities for any architectural work to be taken. They typically represent fiscal limitations, physical limitations (for example, network capacity), time limitations (for example, completion before significant events such as the next annual meeting), or any other limitation that may be a factor that affects the achievement of any architecture activities.

To clarify, in the TOGAF world view, a constraint is imposed by the outside world, and cannot be reduced or removed. For example, a software system delivery lead-time is not a constraint but rather an objective, since it is the enterprise which has fixed this lead-time to meet a need. However, an administrative circular (for example, in the field of tax) or international regulations are constraints that must be respected. These impose a set of rules which must be respected, independently of the enterprise's own goals.

The following categories of constraints are identified:

- **Organizational Constraints:** Describe which organizations/departments/business units are to be covered by the work and/or any areas to be specifically excluded
- **Budget and Financial Constraints:** There are two levels of budget constraints: Short-term constraints are about how much funding is available to support the immediate team creating architecture work products (This might be in \$ or man-days), while long-term budget constraints are about the approximate level and sources of funding that will be available for the ultimate implementation of whatever architecture is proposed. At this stage, short-term constraints must be addressed, whereas long-term constraints should be considered/indicated where possible.
- **External and Business Constraints:** E.g., resources to be used, external dependencies, specific regulations etc.

- **Other Constraints:** Any other constraints that do not fall into the above categories.

The following ratings scales are used below:

Severity of constraint on proposed architecture work:

- Low
- Moderate
- Major
- Critical

Likelihood that constraint will impact proposed architecture work:

- Rare
- Unlikely
- Possible
- Likely
- Almost Certain

Constraints

ID	Constraints	Severity	Likelihood	Mitigation
Organizational Constraints				
	Government organizational structure (Ministry of Justice)	Major	Likely	Develop an inclusion plan to engage the Ministry as soon as possible to bring them into the decision-making process.
2.	Overall institutional capacity across agencies impacted by the architectural work	Major	Almost Certain	<p>The architecture work will require significant support from institutions that have limited technical experts.</p> <p>As mitigation, the National Recovery Program Bureau (NRPB) has engaged a dedicated project coordinator who will focus on the project.</p> <p>It is envisioned that the project will engage a project management and advisory firm to provide technical assistance and to strengthen local capacity through knowledge transfer.</p>

				<p>The available resources from the MDTF provide an additional safeguard to complement the project's implementation.</p> <p>In addition, the World Bank Groups multi-disciplinary task team will provide the necessary technical support and guidance to the Government to facilitate successful implementation.</p>
3.	Fiduciary & Procurement Capacity	Moderate	Possible	<p>The architecture work will result in major new systems that require capacity to procure and properly execute and monitor.</p> <p>The NRPB financial management team is currently performing satisfactorily and has experience in implementing World Bank financed projects.</p> <p>However, the increase in the number of projects managed by NRPB and the implementation arrangements will require coordination with the Ministry of General Affairs (MGA) as the implementing agency.</p>
Budget & Financial Constraints				
4.	Cost of Cloud Services (post project)	Major	Possible	<p>Develop a plan to finance the inclusion of cloud services as a budget line item from conception of project so that when the project ends the Government has a plan to</p>

				pay for continuation of cloud services and hence, sustainability of systems.
5.	General Budget	Major	Almost Certain	Sint Maarten is a relatively “new” country with institutions and administrative processes still under development. A number of civil service positions remain unfulfilled due to these constraints. For example, the ICT department within the Ministry of General Affairs is operating with four personnel to service seven Ministries and over 1,200 users.
External & Business Constraint				
6.	Shortage of local skilled ICT talent	Critical	Almost Certain	Develop ICT and digital literacy training programs to bolster the low amount of local ICT talent. Ideally, through life of the project some of these trainees will be absorbed into work of the project. In the short term, they may have to be bolstered by imported talent.
7.	Lack of fibre wide area network connectivity to most government buildings	Moderate	Possible	Current situation is reliance on microwave-based wireless network at 50 – 60 mbps actual speed (100 mbps theoretical). If wired WAN connectivity cannot be achieved, attempt to increase the bandwidth to key government ministries and service centres.

8.	Bandwidth to main government data centre	Major	Almost Certain	<p>Currently constrained to 200 mbps. Needs to double if cloud-based mirror systems are to be deployed.</p> <p>Need to budget from onset of project for this as an operating expense.</p>
9.	Royal Affairs	Major	Possible	<p>In certain instances, operations of some departments, e.g. Customs, Civil Registry are governed by the Kingdom and Sint Maarten is subject to those stipulations. This may constrain some options and part of the technical design.</p> <p>This constraint cannot be fully mitigated or eliminated. It must be identified and studied closely to fully understand the impact and what adjustments may be necessary.</p>
10.	Cost/Quality of Internet Services	Major	Almost Certain	<p>Based on the latest data from the household budget survey, telecommunications expenses comprise an average of 6 percent of a household's budget, higher than the 2 percent of the GNI threshold established by the International Telecommunications Union for telecommunications expenditure.</p> <p>Most (46 percent) of the fixed broadband services are delivered through a digital subscriber line (DSL), with only 4 percent</p>

				<p>of the services delivered through fiber. This situation limits the quality of broadband services as fiber allows for higher data capacity.</p> <p>There is no mitigation plan in place currently by any of the telecom providers to remedy this.</p>
Other Constraints				
11.	Technical Design Capacity			<p>The technical design of the envisioned architecture work will incorporate modern technologies, policies and procedures that are new to Sint Maarten.</p> <p>Mitigation will include the hiring of a project management firm to ensure that the necessary back-end IT infrastructure and management processes designed under the work are robust and complete prior to developing the digital services.</p> <p>As part of assistance from the World Bank, a Strengthening the Policy and Institutional Environment component has been designed to mitigate risks emanating from the technical design that will enable the Government to introduce the changes in technology and institutional reforms in</p>

				a measured and sustainable way
12.	Political Stability	Major	Unlikely	Sint Maarten has undergone multiple snap elections recently. However, all governments seem to have a high level of stakeholder awareness with respect to the type of digital transformation the architecture will require.

Budget Requirements

The enterprise architecture work will be funded for the next four years through the World Bank via the Sint Maarten Digital Government Transformation Project. Twelve million (12) USD is allocated for this work.

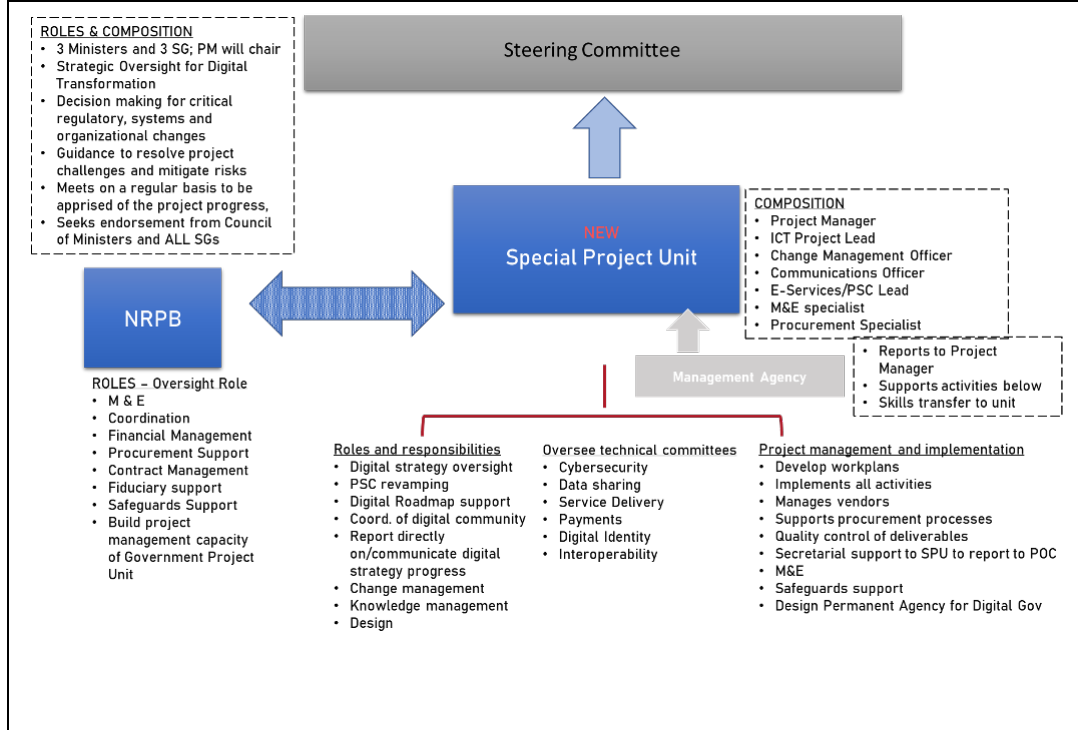
The proposed enterprise architecture work will be complemented by technical assistance from the World Bank to support, anchor, deepen, and sustain the reform processes. A separate World Bank-executed Trust Fund (BETF) of approximately US\$3 million over the lifetime of the project will support the digital transformation agenda. It will ensure the provision of timely and quality technical assistance and advice in digital payments, ICT procurement, one-stop-shop design, and digital identity, as well as produce several discrete studies and policy papers and propose options for the government on interoperability, enterprise architecture, and cybersecurity.

Under the BETF, the Bank will finance consultants, training, and other inputs required to implement activities, such as support for business process re-engineering, an improvement plan for the PSCs, establishing the citizen feedback mechanism, as well as building implementation capacity of the project implementation unit. The main focus area of the BETF will be on the provision of Technical Assistance (TA) to support the policy, legal and regulatory reforms needed. The TA will help the Government identify relevant actions to address challenges faced as they evolve, broker solutions to collective action problems, and help ensure that reform processes are informed and adapted as implementation progresses.

Governance and Support Strategy

Governance Structure

Initial oversight and governance of the enterprise architecture work will come under the governance structure for the World Bank funded Sint Maarten Digital Government Transformation Project. This includes a Special Projects Unit that will be a primary technical counterpart for the project.



The Unit will report directly to the Secretary General of the MGA and the Prime Minister, as well as the Minister of General Affairs and would function for the lifetime of the project. It will be responsible for managing all of the technical aspects of the project, including monitoring and evaluation, financial management, procurement and environmental and social standards activities, facilitating inter-ministerial coordination and implementation of digital initiatives across the seven ministries of government. Core technical responsibilities will include developing and providing strategic direction in the use of digital technologies, effective coordination of departmental information system development and implementation. The Unit will also steer the development of key policies and regulations and provide the inter-agency coordination to enable consensus building and adoption and implementation. It will determine if technical committees are required for policy formulation and convene such committees as necessary (i.e. for cybersecurity, data privacy, service delivery, payments, digital Identify, interoperability). The unit will also be responsible for promoting change management practices and stakeholder engagement, developing effective programs for digital government skills development, knowledge exchange and awareness-raising.

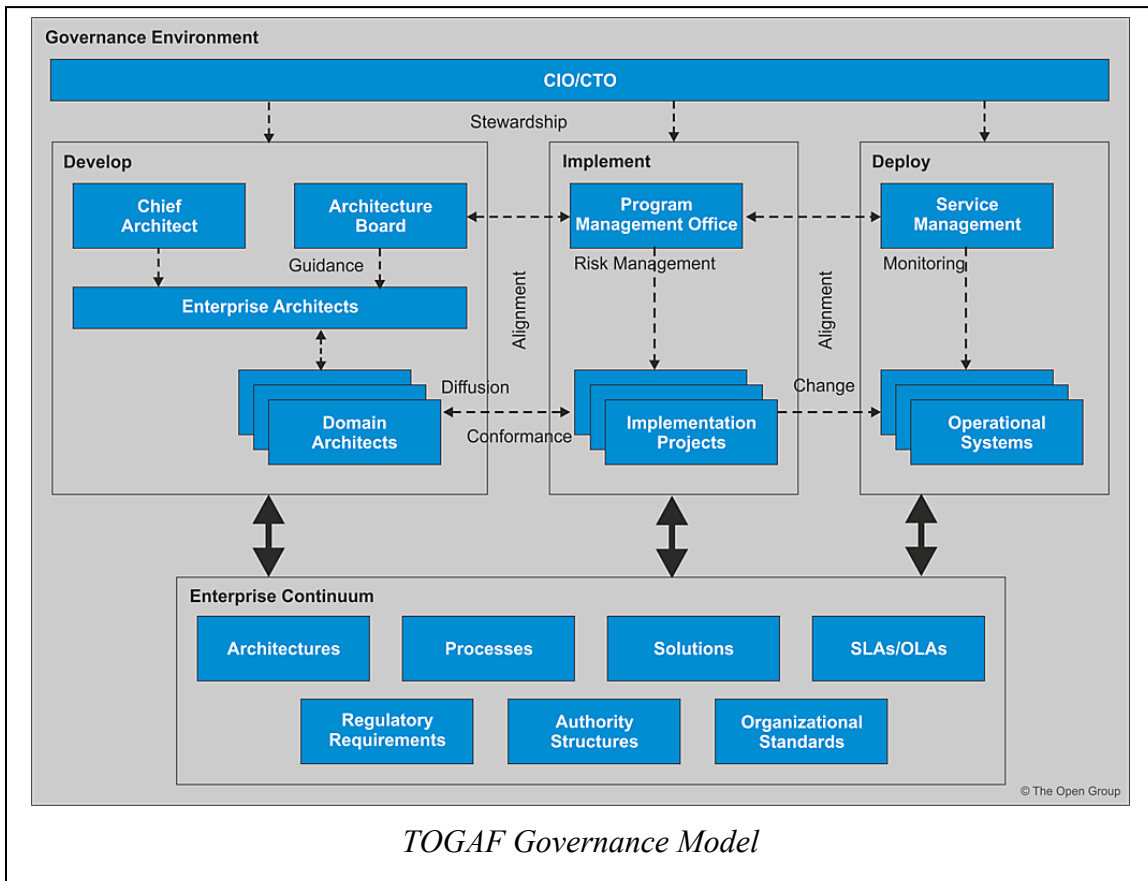
Support Strategy

The Special Project Unit will be led by a Project Manager. He/she would be supported by a government team that would be composed of personnel that has a mix of policy and technical capabilities. The team will draw human resources from inside and outside skilled personnel. Two dedicated focal points from the Ministry of General Affairs who have led

the preparation of the project will be absorbed into the project unit to ensure continuity and provide strategic direction.

The Project Manager will be supported by a core team housed within the NRPB that will include a financial manager and a safeguards specialist. In Year 2 or 3, the project unit would be formalized into a new entity/department/division (which could be housed under the Ministry of General Affairs or as an independent entity under the Prime Minister).

The Project Manager and the Special Projects Units will contract a management firm with responsibilities for day-to-day project implementation. The firm will work alongside the Special Project Unit and NRPB. Its duties will include project management activities such as the development of project workplans, in-house capacity development activities, manage fiduciary and procurement tasks, and perform monitoring and evaluation activities. The firm will also manage technical activities including development of technical terms of references, writing technical specifications and managing requests for proposals and processes for all goods and services to be procured under the project. The firm will provide quality control of deliverables produced by vendors. The firm, under the guidance of the



Unit will work with all relevant government ministries. The firm will be led by a team leader with a team of long term in country staff and temporary experts as needed. The team leader will report to the Special Project Unit project.

While the Special Project Unit will be formed for the purposes of this project, it is envisioned that a Digital Transformation Agency that would be created by the end of year two or three of the project implementation, becomes a permanent government body with the mandate and political authority to oversee the implementation of the digital strategy and digital government initiatives for Sint Maarten.

Digital Transformation Agency

Like any enterprise activity, enterprise architecture management requires the setup of a particular organization: governance rules, processes, roles and responsibilities, and tools.

Architecture Governance is the practice and orientation by which Enterprise Architectures and other architectures are managed and controlled. In order to ensure that this control is effective within the organization, it is necessary to have the correct organizational structures established to support all governance activities. The body envisioned to provide that function in Sint Maarten is the Digital Transformation Agency (DTA) or something similar in form and function capable of providing a governance role.

TOGAF provides high level models² upon which to model governance structures that the DTA will use as a guideline. Fundamentally, these models all deal with similar basic concepts. Governance must deal with the deployment of new systems and their integration, the implementation of these projects and the deployment and operations of new and existing systems. All of this is underpinned via a series of reference architectures, standards and processes, service level agreements, legal and regulatory requirements and organizational standards. The DTA will be modelled using these frameworks as guidance.

Enterprise Architecture Repository

Finally, enterprise architectures and their artefacts must be accessible to all within the communities that they affect. Commonly this is done via the creation of an enterprise architecture repository that is a living thing that accurately reflects the current state of the enterprise. An enterprise repository will be developed to maintain all enterprise architecture work developed for Sint Maarten.

² <https://pubs.opengroup.org/architecture/togaf9-doc/arch/chap44.html>

Chapter Four: Architecture Principles

Architecture Principles are general rules and guidelines, intended to be enduring and seldom amended, which informs and supports the way in which an organization sets about fulfilling its mission.

In consultation with the ICT function of the Government of Sint Maarten, the following architectural principals were codified in order to form a base for future ICT work.

Principles Template

Principles are general rules and guidelines, intended to be enduring and seldom amended, which informs and supports the way in which an organization sets about fulfilling its mission.

Principles may be just one element in a structured set of ideas that collectively define and guide the organization, from values through to actions and results.

Each principle is defined based on the template below.

<Name of Principle>	
Reference	<Unique identifier for the principle>
Statement	A Statement that can succinctly and unambiguously communicate the fundamental rule.
Rationale	The Rationale highlights the business benefits of adhering to the principle, using business terminology. It points to the similarity of information and technology principles to the principles governing business operations. It also describes the relationship to other principles, and the intentions regarding a balanced interpretation. Sometimes, a Rationale describes situations where one principle would be given precedence or carry more weight than another for making a decision.
Implications	The Implications highlight the requirements, both for the business and IT, for carrying out the principle - in terms of resources, costs, and activities/tasks. It will often be apparent that current systems, standards, or practices would be incongruent with the principle upon adoption.
Mandatory/ Advisory	If the particular principle must be fulfilled.
Review Reason	The reason why this principle has to be reviewed.

Review Date	The date when the principle is reviewed.
-------------	--

Business Principles

1.1 Digital by Default	
Reference	B-01
Statement	The priority of Government should be on providing digital public services through electronic means with continuous effort on fully automating services wherever possible and justified by a strong business use case. These services should be inclusive by default able of serving the maximum number of citizens possible.
Rationale	There is need to enhance the efficiency, quality, and resilience of selected public services for citizens, businesses, and government officials.
Implications	<ol style="list-style-type: none"> 1. Government will provide citizens and businesses with the option to interact digitally with public administrations, if they choose to 2. Government will take steps to reduce the need for citizens and businesses to unnecessarily interact with public administration by enabling interconnection of key data registries thereby reducing the number of distinct interactions a citizen has to make with government while obtaining a particular service 3. Government will take steps to ensure that where possible and feasible digital public services are accessible to all citizens and businesses 4. Government will take steps to increase the readiness of citizens and businesses to interact digitally with public administrations by developing their digital skills as well as promoting the available digital public services 5. Government will take steps to enable seamless digital delivery of services across sectors and collaboration between the public administration, private sector and digital society
Mandatory/ Advisory	Mandatory

Data Principles

1.2 “Once Only” & Data Minimization	
Reference	D-01
Statement	The Government will collect data from people and businesses only once. Citizens of Sint Maarten should not have to repeatedly submit the same data to obtain government services. Government agencies will be identified as owners of specific datasets which will be shared respecting privacy and confidentiality with other government agencies.
Rationale	<p>Repeated collection of data imposes unnecessary costs and burdens on the government and reduces the quality of service provided to citizens.</p> <p>Repeated collection of data results in multiple agencies holding the same data that quickly goes out of sync between the agencies.</p> <p>The process of copying key data from one agency to another within the Government causes unnecessary workload on Government staff. It allocates critical staff resources to this process vs. to allocating them to the provision of service. It raises operating costs in multiple ways: 1) staff must manage and oversee this process, and 2) staff must take time to deal with inevitable data quality mismatches that arise.</p>
Implications	<ol style="list-style-type: none">1. The Government will identify key data registries that are essential for the provision of government service.2. The Government will identify owners of key data registries across the Government. These owners will become the authoritative single source of truth for those datasets responsible for the cleanliness, accuracy and accessibility.3. The Government will enable real-time programmatic access these registries enabling approved and authorized users to access the data in these registries in real-time.
Mandatory/ Advisory	Mandatory

1.3 Expectation of Privacy & Data Protection

Reference	D-02
Statement	Citizens of Sint Maarten have the right and expectation of privacy and confidentiality of all data collected by the Government of Sint Maarten and the right to correct that data.
Rationale	<p>Underpinning a digital society are the concepts of trust and confidence. The online environment brings additional challenges to maintaining both. Citizens will assess the trade-off between convenience and confidence in the way that personal data collected through e-Government services is managed and protected from misuse and abuse. Therefore, maintaining that trust and confidence is essential.</p> <p>In the context of e-Government, “privacy” specifically refers to principles for the fair use of information. The concept of fair information practices holds that the citizen retains an interest in the information collected by the government during a required or voluntary interaction. The citizen’s rights include a right to insist that the information be used only for the purposes for which it was collected, that it be retained no longer than necessary, that it not be redisclosed, and that it be kept in accurate form.</p>

<p>Implications</p>	<p>1. The Government will follow international guidelines regarding data privacy and protection. This shall include:</p> <ul style="list-style-type: none"> • Limitation of the collection of personal data and any such data should be obtained in a lawful and fair means with the consent of the consent of the citizen. • Quality of Data is such that it shall be complete, accurate and kept up to date • Purpose of Collection shall be specified at time of collection • Limitation of Use, i.e. data shall be used only for the stated purpose at time of collection • Security of data, i.e. data collected shall be protected by reasonable security and safeguards • Openness of Data, i.e. be open about the policies, practices and procedures surrounding collected personal data • Individual Rights, i.e. citizens will have the right to obtain what information has been collected about them and the right to correct said data • Accountability, i.e. the Government shall appoint a person accountable for data privacy and protection.
<p>Mandatory/ Advisory</p>	<p>Mandatory</p>

1.4 Openness & Transparency	
Reference	D-03
Statement	The activities and intentions of public sector organizations are by default open to scrutiny by the citizens.
Rationale	Transparency is a powerful tool that assists governments in combatting low citizen trust, corruption, bad performance, low accountability and power abuse by public officials. Transparency via open data policies reveals the business of government to citizens and helps promote: 1) good governance, 2) better service and policies, 3) more agile, effective and convenient public engagement, 4) greater trust in government, 5) social well-being and inclusion, and 6) economic growth.
Implications	<p>The ICT Authorities of the Government of Sint Maarten will assist the Government in implementing internationally recognized open data standards and policies. Specifically, they will:</p> <ol style="list-style-type: none"> 1. Assist with the selection of datasets to be opened 2. Assist with the open licensing process, i.e. help determine what intellectual property rights exist in the data and what 'open' licenses exist and support both the rights and the openness of the data 3. Make the selected datasets available in and bulk and useful formats 4. Make the selected datasets easily discoverable
Mandatory/ Advisory	Advisory

Application Principles

1.5 Security by Design	
Reference	A-01
Statement	Information security best practices and principles will be incorporated into the design of all ICT systems beginning with the design phase and including security testing before being put into production
Rationale	<p>Information security is a complex but essential requirement to safeguard and protect the information systems including the information of the Government of Sint Maarten. Designing information systems without paramount consideration of information security at conception of system design through deployment has proved to make systems less secure or not secure at all.</p> <p>The cost of fixing a security issue is significantly less in design than it is in production.</p>
Implications	<ol style="list-style-type: none">All security controls will be designed to adhere to the following:<ul style="list-style-type: none">Confidentiality – only allow access to data for which the user is permittedIntegrity – ensure data is not tampered or altered by unauthorized usersAvailability – ensure systems and data are available to authorized users when they need itThe design of all applications and information systems shall:<ul style="list-style-type: none">Minimize attack surface area, i.e. the principle of minimizing attack surface area to restrict the functions that users are allowed to access, to reduce potential vulnerabilitiesEstablish secure defaults meaning that there should be strong security rules for how user registrations are handled, how often passwords must be updated, how complex

passwords should be, etc. These should be set to a high-security level by default

- Follow the **Principle of Least Privilege** to ensure that users have the minimum set of privileges required to perform a specific task
- Follow the principle of **Defense in Depth** to ensure that applications, networks and information systems have progressively multiple layers of security protecting them
- **Fail Securely** to ensure that system failure does not give the user additional privileges, and it should not show the user sensitive information like database queries or logs
- **Not Trust by Default** to ensure that applications and systems shall always check the validity of data that third-party services send and not give those services high-level permissions within the app
- Have a **Separation of Duties** to ensure that users, administrators, etc. shall not be able to perform tasks that benefit themselves, e. g. change tax assessment data
- Avoid **Security through Obscurity**, i.e. there should be sufficient security controls in place to keep your application safe without hiding core functionality or source code
- **Keep Security Simple**, i.e. developers shall avoid the use of very sophisticated architectures when developing security controls for their applications wherever possible as this increases the probability of a security lapse. Further, developers shall avoid creating their own security and encryptions algorithms and reuse well-known and tested ones instead.
- **Fix Issues Correctly and Quickly** in order to maintain the integrity of systems

3. The Government ICT authorities will implement a security lifecycle for all systems and applications that includes:

- Review of security requirements during the requirements definition phase
- Review of security during the design phase

	<ul style="list-style-type: none">• Ensure that code review for security is performed during development by a reputable third party• Ensure that vulnerability scanning or penetration testing is carried out by a reputable third party before a system goes to production
Mandatory/ Advisory	Mandatory

1.6 User-Centricity	
Reference	A-02
Statement	The design and delivery of government services will be guided by the need, context and motivation of its' users, i.e. citizens, businesses and civil servants.
Rationale	Delivery of improved public services begins with modern and agile ways of developing and deploying digital technology to serve the users' needs and the benefit of the society. Systems that are designed without adequate input and consultation of the end-user contribute to poor quality of service and a negative perception of the Government.
Implications	<p>The Government will:</p> <ol style="list-style-type: none"> 1. Provide an option to interact with agencies without undue burden on the user through identifying and prioritizing the channels and workflows from the perspective of users as opposed to agencies and officials; 2. Take steps to ensure all services and interactions with government are findable, personalized and accessible at the moment of need and in a non-discriminatory manner, with appropriate assistance available upon need 3. Use universal user-centric service design principles and ensure their implementation in service development processes 4. Set up and maintain redress and feedback mechanisms and ensure the data gathered will be continually introduced to the service improvement and development process; 5. Improve awareness and skills of user-centric design practices in all agencies.
Mandatory/ Advisory	Mandatory

1.7 Standard Government e-Services Digital Catalogue	
Reference	A-03
Statement	All new applications shall, by default, use standardized digital services provided by the Government.
Rationale	Across the landscape of the government, there are functionalities that many applications share, e.g. authentication and authorization, ability to accept payments, etc. In the interests of standardization, efficiency, and cost reduction these building blocks can be provided and reused across all applications. This will not only reduce the cost of new applications, it will provide functionality to these applications to make them fuller featured, and provide citizens with a standard method of performing these tasks across all government applications; thereby reducing their learning curve and the friction they experience interacting with government systems.
Implications	<p>The Government will:</p> <ol style="list-style-type: none"> 1. Publish a digital catalogue of common services 2. Publish guidance on how to integrate these into applications 3. Provide the following services: <ul style="list-style-type: none"> • A centralized method of data exchange through which all data between government entities will be exchanged • Single Sign-On: A service for authentication that is common for all citizens to logon to existing government services • Electronic Payment: A service that permits an application to accept various methods of payment electronically 4. Add new services to the catalogue as they are developed 5. Audit new applications to enforce this standard
Mandatory/ Advisory	Mandatory

Technology Principles

1.8 Interoperable by Default	
Reference	T-01
Statement	Government agencies should seek to utilize existing data sources and proven services prior to establishing their own.
Rationale	The copying of data and use of processes like Extract-Transform-Load (ETL) lead to data quality issues over time and unnecessary burden on staff to maintain these connections.
Implications	Government agencies will design all new systems, and where possible and appropriate, retrofit existing systems to utilize the Government Data Exchange to obtain data from the authoritative owner of that data.
Mandatory/ Advisory	Mandatory

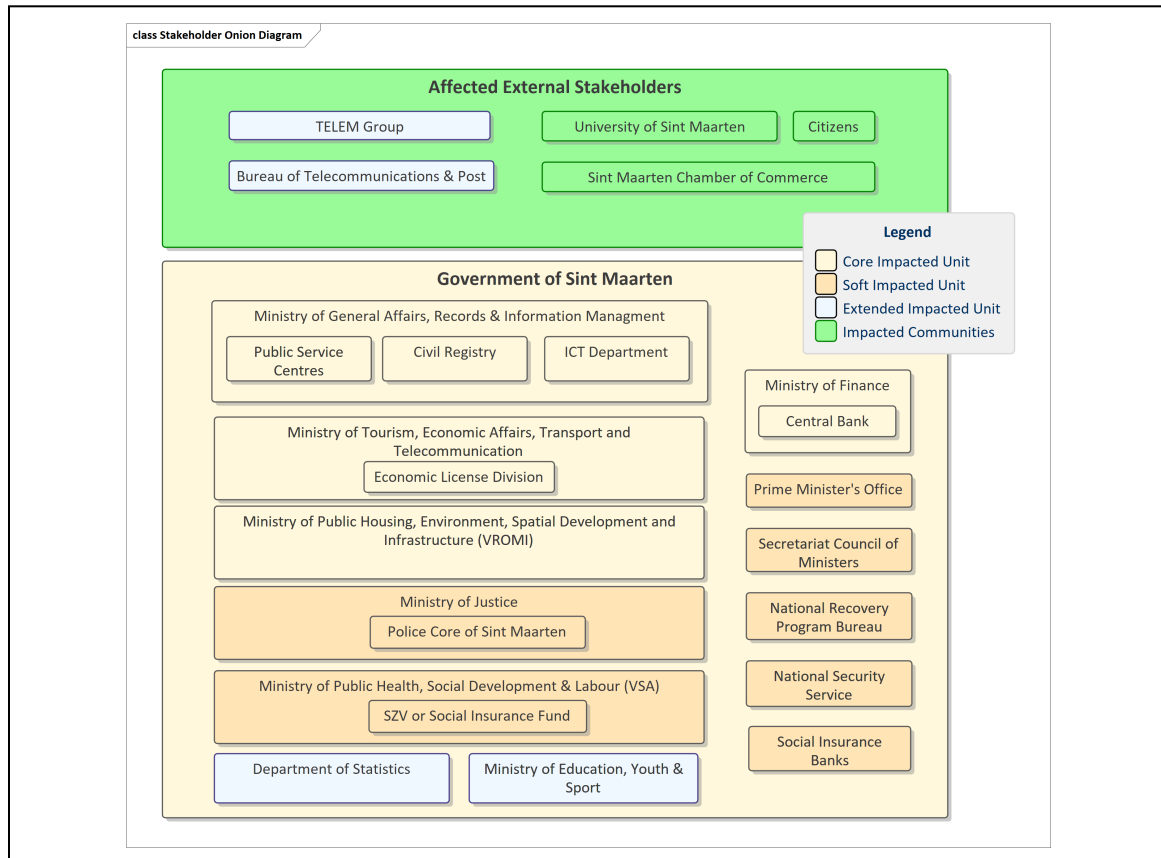
1.9 Government Data Exchange

Reference	T-02
Statement	All Government entities shall exchange data via a centralized data exchange mechanism
Rationale	The flow of data across governments is vital to helping improve efficiency of service to the public, improving data quality and reducing operating costs and burdens. Copying data regularly between agencies not only causes extra workload on staff but also leads to data quality issues as data eventually and inevitably goes out-of-sync. Purely connecting systems from agencies on an ad-hoc basis creates an uneven playing field between agencies and greatly increases the burden on ICT staff to maintain potentially multiple distinct connections. By offering all government agencies one centralized, standards-based mechanism to connect to for data exchange will greatly reduce operating costs.
Implications	The Government will establish a single point of connection that is based on open-standards for all agencies to connect for the purposes of data exchange.
Mandatory/ Advisory	Mandatory

Chapter Five: Business Goals & Principles

Business principles, business goals, and business drivers provide context for architecture work by describing the needs and ways of working employed by the enterprise. Many factors that lie outside the consideration of architecture discipline may nevertheless have significant implications for the way that architecture is developed.

It is important to set the scope of the proposed architectural work before proceeding. This initial EA work is limited to a whole-of-government subset. That subset is defined by a €470 million Euro Single Donor Trust Fund (SDTF) from the Government of the Netherlands that the World Bank manages as Trustee. The SDTF finances activities for the recovery, reconstruction and resilience building of Sint Maarten. Given recent natural disaster catastrophes³ in Sint Maarten and the damage they caused, there is pressing need to improve the efficiency of public service delivery, revenue collection, and general government operations. E-government was identified as a top priority by the SDTF Steering Committee to address these needs. The Steering Committee approved financing for a Digital Government Transformation project on April 24, 2019. Therefore, the core



impacted units⁴ identified in the diagram above will be the primary focus of this work. Subsequently, the EA will be expanded to include the whole-of-government. Further, even

³ Hurricanes Irma and Maria - 2017

⁴ Core Impacted Unit: The most affected and achieve the most value from the work. See Organizational Model for the Enterprise for further details.

though the Ministry of Finance is identified as a core impacted unit via participation of the Central Bank, the EA will only focus on integration with payment platforms at the Ministry as it relates to other core impacted units.

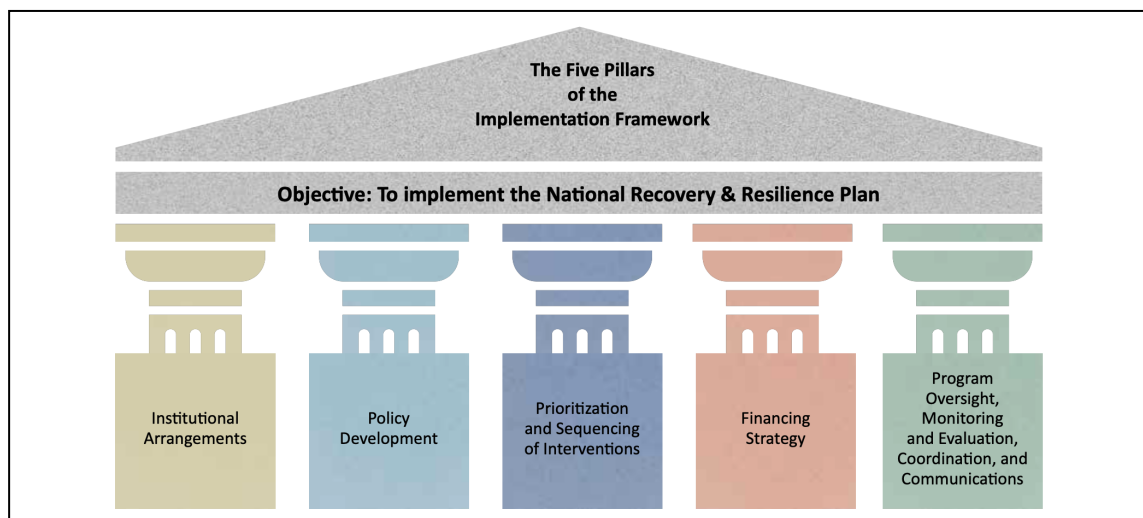
Business Goals

Context & Mission

This section describes the rationale for the EA and provides the background context that is driving this initiative.

The Government of Sint Maarten is the key stakeholder with the citizens of Sint Maarten the ultimate beneficiaries. Traditionally under TOGAF, it is customary to frame the context of this document under the enterprise's mission statement which serves as its guiding principle. As a government, there is not an explicit mission statement per se but instead a Constitution and governing articles and the political strategy the Government puts forward under those articles. Given the catastrophic events Sint Maarten has suffered in the past 3 years, i.e. hurricanes Irma and Maria, and the extensive damage caused by those events, a key driver behind recent initiatives has been immediate short-term and long-term recovery of infrastructure, systems, etc. and building resilience into same. This was the core pretext behind the funding of the SDTF and approval of the digital government initiative and support for selected activities from the Government of Sint Maarten's National Recovery and Resilience Plan (NRRP)⁵. The digital government initiative is meant to support selected activities of the NRRP.

More recently, the effects of the COVID-19 pandemic have underscored the urgency of digitalizing government services in Sint Maarten. As a result of physical distancing requirements, the Public Service Center limited its operating hours and service delivery was significantly curtailed during the pandemic. All non-essential public workers were also required to work from home, though remote access proved challenging as most civil



⁵ <http://www.sintmaartengov.org/government/AZ/NRPB/Presentations/NRRP%20final.pdf>

servants rely on personal devices to connect. With limited capacity to continue to process services virtually, public service delivery was effectively halted.

The overarching goal of the NRRP is “to restore, secure, and strengthen the well-being of the people of Sint Maarten. This requires a resilient community in a healthy living environment; a resilient, growing, and more diversified economy; and a transparent, effective government with enhanced capacity.”

The Plan looks at the immediate, short, medium and long terms and is structured around the themes of: a) community recovery and resilience, b) economic recovery and resilient, and c) government recovery and resilience. To execute the plan the Government created the National Recovery Program Bureau (NRPB) that will coordinate recovery and resilience projects under a structured implementation framework with 5 key pillars (see above).

According to the NRRP “the top priorities are (a) the basic needs of the people of Sint Maarten—such as food, shelter, health and psychosocial care, education, and livelihoods, (b) the urgent preparations for the peak of the upcoming hurricane season and (c) the multisectoral approach to restarting the economy.” The expected outcomes of these priorities are “(a) sustainable recovery of social sectors in affected communities; (b) restoration of business continuity combined with a strategy for fostering and broadening business activity; (c) rehabilitation and reconstruction of critical infrastructure to Build-Back-Better (BBB) standards; and (d) strengthening of the country’s social, economic and governmental readiness to mitigate, respond to and recover from the future impacts of natural disasters and climate change.” To achieve these outcomes the Government has taken a multisectoral approach aggregating proposed interventions across 18 sectors to achieve the intended outcomes under three recovery and resilience components: community, economy, and government.

The Community Resilience component addresses resilient recovery of social sectors in affected communities. This includes a wide variety of interventions in Housing; Health; Education, Culture, Youth, and Sport; Sanitation and Solid Waste Management; Environment, Ecology, and Biodiversity; and Employment, Livelihoods, and Social Protection.

The Economic Recovery & Resilience component identifies business activity, macroeconomic matters, infrastructure and roads and drainage as key targets. This includes conducting a coordinated, multisectoral program of targeted interventions to build the resilience of vital utility networks, including the electricity, water supply, and telecommunications sectors.

The Government Recovery & Resilience component identifies disaster response and mitigation, financial capacity, fiscal challenges, public security, paradigm shift and prioritization and data capacity and deficits as key targets. Financial capacity calls to “strengthen public financial management (PFM) capacity to better track, monitor, and promptly respond to identified gaps.” This includes modernizing the tax system to improve

compliance and collection and to stimulate investment as enhanced tax revenues provide a base for expanded social services and enhanced resilience. Public security ensures that justice, public safety, and security systems are strengthened to ensure law and order, including ICT systems underpinning these areas. Data and capacity deficits highlight the country's weaknesses and shortage of actionable data collection and analysis as well as the capacity to rectify the same.

From an ICT perspective, under the umbrella of the 3 components, a number have significant ICT and enterprise architecture implications:

- a) Critical infrastructure within the telecoms sector has been identified as a pressing need. During recent hurricane IRMA, all 13 major cell towers came down on the island and over 30 micro cell sites were severely damaged. In total close to 65% of the telecom networks on Sint Maarten were compromised. Due to these major infrastructural damages, phone, internet, broadcasting, and trunking services were jeopardized or experienced no to limited availability.
- b) The national Disaster Relief Management (DRM) framework faced serious challenges in the aftermath of Hurricane Irma, highlighting the need for improved disaster risk information and communication, enhanced DRM capacities, and better access to risk financing options. National geospatial systems and technologies will need to be improved if the above is to be met. The Government is planning a National Spatial Data Infrastructure to be fully implemented across Government agencies that will, in part, address both the DRM need and weaknesses/shortages in actionable data cited earlier.
- c) The Government's public financial management PFM system challenges have been noted in several reports issued by the SOAB (internal auditor), Algemene Rekenkamer (General Audit Chamber, external auditor), and CFT (Council of Financial Supervision). The Government plans to improve public financial management via the implementation of a Government Financial Management Information System (GFMS) that will give Government more effective means to control budget execution, fiscal expenditure management, and reporting for effective planning and decision-making.
- d) Key to this is ICT systems underpinning PFM functions and capacity to share data and facilitate information flows.

The key Ministry identified to spearhead reforms is the Ministry of General Affairs. It is the holder of the Civil Registry, a central and key registry in the government, and is the home of the Government's ICT Department. It is also the key and most visible touchpoint the Government has with its citizens via Public Service Centres through which it delivers services to citizens for many other Ministries.

The Ministry of General Affairs⁶ lists its mission statement as:

⁶ <http://www.sintmaartengov.org/government/AZ/Pages/About.aspx>

“The mission of the Ministry of General Affairs of the Country Sint Maarten is to care for, coordinate, advise on and support the process towards the general government policy. To care for the preparation, publication and management of the laws and regulations of the land, and responsibility for legal advising national security and disaster management, as well as the development integration and making operational the concerns with respect to foreign relations. Also, the care for an effective, efficient, trustworthy and client friendly service to the government organization, business sector, citizens and organizations that make up the community of Sint Maarten, as well as the care for external communication pertaining to government policy in general. The aforementioned will be carried out under the credo: “Strong, Compassionate and Decisive”.”

The other key stakeholder is the National Recovery Program Bureau (NRBP). The NRBP was established as an independent administrative agency in December 2018. On behalf of the Government of Sint Maarten, the NRBP is responsible for the preparation, implementation and evaluation of the projects that are financed by the Sint Maarten Recovery, Reconstruction and Resilience Trust Fund or by other available sources of funding.

Business Goals

The goal of this section is to delineate high-level business goals the Government of Sint Maarten has currently. Not all of the goals listed below directly impact ICT, and their order of appearance does not indicate their priority level. However, they are provided for additional context and may be helpful for a whole-of-government EA.

Business Principle	
Reference	B-001
Statement	The priority of Government should be on providing digital public services through electronic means with continuous effort on fully automating services wherever possible and justified by a strong business use case. These services should be inclusive by default and capable of serving the maximum number of citizens possible.
Rationale	There is need to enhance the efficiency, quality, and resilience of selected public services for citizens, businesses, and government officials. This has especially become critical in the COVID-19 era.
Implications	<ol style="list-style-type: none"> 1. Government will provide citizens and businesses with the option to interact digitally with public administrations, if they choose to 2. Government will take steps to reduce the need for citizens and businesses to unnecessarily interact with public administration by enabling interconnection of key data registries thereby reducing the

	<p>number of distinct interactions a citizen has to make with government while obtaining a particular service</p> <ol style="list-style-type: none"> 3. Government will take steps to ensure that where possible and feasible digital public services are accessible to all citizens and businesses 4. Government will take steps to increase the readiness of citizens and businesses to interact digitally with public administrations by developing their digital skills as well as promoting the available digital public services 5. Government will take steps to enable seamless digital delivery of services across sectors and collaboration between the public administration, private sector and digital society
Mandatory/ Advisory	Mandatory
Review Reason	
Review Date	

Business Principle	
Reference	B-002
Statement	The Government will collect data from people and businesses only once. Citizens of Sint Maarten should not have to repeatedly submit the same data to obtain government services. Government agencies will be identified as owners of specific datasets which will be shared respecting privacy and confidentiality with other government agencies.
Rationale	<p>Repeated collection of data imposes unnecessary costs and burdens on the government and reduces the quality of service provided to citizens.</p> <p>Repeated collection of data results in multiple agencies holding the same data that quickly goes out of sync between the agencies.</p> <p>The process of copying key data from one agency to another within the Government causes unnecessary workload on Government staff. It allocates critical staff resources to this process vs. allocating them to the provision of service. It raises operating costs in multiple ways: 1) staff must manage and oversee this process, and 2) staff must take time to deal with inevitable data quality mismatches that arise.</p>
Implications	<ol style="list-style-type: none"> 1. The Government will identify key data registries that are essential for the provision of government service.

	<p>2. The Government will identify owners of key data registries across the Government. These owners will become the authoritative single source of truth for those datasets and be responsible for their cleanliness, accuracy and accessibility.</p> <p>3. The Government will enable real-time programmatic access to these registries enabling approved and authorized users to access the data in these registries in real-time.</p>
Mandatory/ Advisory	Mandatory
Review Reason	
Review Date	

Business Principle	
Reference	B-003
Statement	There must be better data sharing across government with higher quality data in general and where data is not duplicated across institutions. Data sharing should be seamless and not put excessive burdens or workloads on Ministries both in terms of initial setup and maintenance. Data quality should be of primary concern.
Rationale	The copying of data and use of processes like Extract-Transform-Load (ETL) lead to data quality issues over time and unnecessary burden on staff to maintain these connections.
Implications	Government agencies will design all new systems, and where possible and appropriate, retrofit existing systems to utilize a standardized mechanism for data exchange to obtain data from the authoritative owner of that data vs. copying data between registries and datasets.
Mandatory/ Advisory	Mandatory
Review Reason	
Review Date	

Business Principle	
Reference	B-004
Statement	There must be establishment of a National Platform for Disaster Risk Reduction (DRM) to provide the enabling environment to improve coordination, develop integrated policies, and improve institutional

	arrangements for more effective DRM and climate change adaptation in the country.
Rationale	The national DRM framework faced serious challenges in the aftermath of Hurricane Irma, highlighting the need for improved disaster risk information and communication, enhanced DRM capacities, and better access to risk financing options.
Implications	There must be a renewed and systematic approach in government towards the concept of business continuity and resilience in general. The Government will have to undertake a systematic review of all business continuity practices and apply best-practice techniques to business continuity planning if resilience is to be achieved across government.
Mandatory/ Advisory	Mandatory
Review Reason	
Review Date	

Business Principle	
Reference	B-005
Statement	There must be significant improvements to public financial management capacity and modernization of the tax system.
Rationale	The improvement of the Government's PFM system (resource generation, resource allocation, and expenditure management) would benefit from institutional strengthening. This, in turn, would strengthen investor confidence, foster public support for Government initiatives, and aid in the recovery and longer-term development efforts.
Implications	<p>This will require a complete review of existing systems in government related to public financial management. This must include a re-examination of the current FMIS, Decade to see whether it is fit for purpose, GEFIS, the payment software at the Receiver's Office and Tax Siah, the tax administration software. These systems may need to be entirely replaced.</p> <p>The following other initiatives are under consideration to address deficiencies in the resource generation and expenditure management areas:</p> <p>(a) tax reform (e.g., legal framework, housing, tax base, collection, compliance, etc.);</p> <p>(b) enhanced PFM framework and GFMIS.</p>

	<p>(c) related ICT system improvement to support increased resource mobilization. ICT systems improvements will involve migration to Microsoft Dynamics AX as the system of record for financial management.</p> <p>(f) reconstruct the Tax Receivers/Registry building, which was seriously damaged by Hurricane Irma, to unite the Receivers and the Tax Departments in one building.</p>
Mandatory/ Advisory	Mandatory
Review Reason	
Review Date	

Business Principle	
Reference	B-006
Statement	There must be strengthening of national geospatial management capacity
Rationale	The last national disasters and their aftermath showed there is a strong need to strengthen national geospatial management capacity, essential to adequate risk planning and disaster response.
Implications	<p>The interventions needed include:</p> <ol style="list-style-type: none"> 1. Establishing a national spatial data infrastructure 2. Developing data tools such as the Post Disaster Needs Assessment (PDNA) capacity tool, and assessment tools such as a Quality of Life Index (QLI)
Mandatory/ Advisory	Mandatory
Review Reason	
Review Date	

Business Principle	
Reference	B-007
Statement	There must be improvement of public safety and security in Sint Maarten.
Rationale	Ensuring safety, security, law and order and stability and maintaining these core objectives throughout the relief and recovery phases and beyond is essential for rebuilding Sint Maarten's society and having

	tourists and businesses return to the island. This shall include all efforts related to cybersecurity.
Implications	<p>The buildings, equipment and overall organizational capacity of the entities within the Justice chain (e.g. Prison, Police, Court House, OM (Public Prosecutor), Foundation Judicial Institutes, Immigration Department, Court of Guardianship, Coast Guard, Customs, National Detectives, Financial Intelligence Unit, Judicial Affairs, Staff Bureau) were impacted by the hurricane.</p> <p>The following areas will need to be addressed:</p> <ol style="list-style-type: none"> 1. repair and strengthen physical facilities such as the prison and police stations 2. relocate and equip the 911 dispatch center with the ultimate goal of improving the resilience of the emergency communications network among fire, police, and emergency management agencies 3. properly equip law enforcement staff to replace vehicles and uniforms damaged by the hurricanes 4. address critical ICT needs.
Mandatory/ Advisory	Mandatory
Review Reason	
Review Date	

Strategic Plans

This section attempts to document the current strategic plans that are in place within the ICT Department.

Strategic Plan Element	
Reference	SP-001
Statement	Public Financial Management (PFM) Modernization
Rationale	<p>Public financial management systems are key to resource generation, resource allocation, and expenditure management and would strengthen investor confidence, foster public support for Government initiatives, and aid in the recovery and longer-term development efforts.</p> <p>Core ICT systems are essential for the above to be achieved. Many key systems within the Ministry of Finance were commissioned</p>

	<p>prior to 2000. The key system is a commercial software called Decade, commissioned in 1997 with 10 users using client-server technology and used for financial management. It interfaces with GEFIS via manual import/export but should interface with most other systems that have payment implications. The system is physically located at the Police Headquarters and was moved out of the main Government data centre contrary to internal policy. The backend is based on Oracle 9 technology. This is very old. Extended life support ended in 2010.</p> <p>The Ministry also uses DECOS and Tax Siah, a custom-built solution from Bearing Point commissioned in 1994 with 60 users for tax assessment. The latter interfaces with GEFIS using manual import and export.</p>
Implications & Recommendations	<p>The Government is currently looking at Microsoft Dynamics AX as a replacement for core public financial management.</p> <p>The following is recommended:</p> <ol style="list-style-type: none"> 1. Functional/Non-Functional Requirements Gathering & Definition 2. Technical Assessments & Architecture Development 3. Procurement 4. Implementation 5. Quality Assurance including security testing 6. User Training 7. Deployment to production
Mandatory/ Advisory	Mandatory
Review Reason	
Review Date	

Strategic Plan Element	
Reference	SP-002
Statement	Expansion of the use of Microsoft Dynamics CRM software across all ministries.
Rationale	On-premise versions of Microsoft Dynamics CRM are heavily in use in multiple ministries for various applications, e.g. Education – LEXX & SMART, TEATT – BLISS, VSA & Ministry of General Affairs. Recently the Council of Ministers approved the use of CRM for the Ministries of Finance and Education for the purposes of workflow management.

	<p>The platform is well understood within Sint Maarten and has the support of a local vendor.</p> <p>There will be an opportunity to move all Dynamics CRM off-premise to the cloud utilizing Dynamics 365 in the future which will permit a cloud first, cloud native approach that will greatly assist with business continuity and resilience and help in reducing ICT workload.</p>
Implications & Recommendations	<p>Continued business processes and workflow analysis will need to be completed to determine functional and non-functional requirements where expansion/replacement is warranted. The local vendor will need to be contracted to make additional modifications to the existing systems and service level agreements should be negotiated to ensure continued maintenance of these systems.</p> <p>Provisions need to be made to ensure adequate end-user training has been provided to ensure transition.</p>
Mandatory/ Advisory	Mandatory
Review Reason	
Review Date	

Strategic Plan Element	
Reference	SP-003
Statement	Expanded use of the cloud for resilience and business continuity
Rationale	The last national disasters showed the gaps in business continuity across government systems. The use of the cloud and its built-in resiliency mechanisms offers opportunities to develop a systematic and comprehensive approach to business continuity. Further, leveraging the cloud offers advantages in terms of workloads on an already stressed and small ICT Department.
Implications & Recommendations	<p>The Government is examining how and which applications could be mirrored in the cloud to improve resiliency. This has potential to affect most if not all systems across government along with financial implications. Given this, the following structured approach is recommended:</p> <ul style="list-style-type: none"> • Evaluation Phase <ul style="list-style-type: none"> ○ Completion of a Cost Benefit Analysis (CBA)

	<ul style="list-style-type: none">○ Comparative Performance Analysis (of existing systems that are to be moved)○ Technical Analysis and Requirements that looks at:<ul style="list-style-type: none">▪ Various cloud model topologies (public, private, hybrid, etc.) and types (IAAS, SAAS, PAAS, serverless, etc.), the pro and cons of each and determination of the best approach(s)○ Contingency Analysis (risk analysis)<ul style="list-style-type: none">▪ List key operational risks that would need to be analyzed and considered in the move to the cloud. These will include, but are not limited to some of the following: confidentiality of the data, integrity of the data, availability, physical location of where data is stored, encryption, etc.○ Acquisition Analysis<ul style="list-style-type: none">▪ How to purchase cloud services▪ Types of procurement contracts, e.g. whole vs modular contracting approaches▪ Contract types (standalone, agency specific, gov't wide, shared across agencies, brokering a contract through a third party, etc.)▪ Contract Pricing (fixed price, fixed prices with adjustments, etc. vs. cloud pay as you go, cloud reserved instances, etc.)● Analysis and Decision Phase<ul style="list-style-type: none">○ Business Use Case for Decision Makers<ul style="list-style-type: none">▪ Development of decision note to high level decision makers within a government. The content of such a note would include:<ul style="list-style-type: none">▪ Key assumptions (financial, non-financial)▪ Description of alternatives▪ Description of approach to solving the problem
--	--

	<ul style="list-style-type: none"> ▪ Summary of objective criteria used and conclusions with rationale ▪ Description of implementation plan at level sufficient for decision making <ul style="list-style-type: none"> • Implementation Phase <ul style="list-style-type: none"> ○ Procurement & Service Level Agreement ○ Project Planning • Post Implementation Maintenance
Mandatory/ Advisory	
Review Reason	
Review Date	

Strategic Plan Element	
Reference	SP-004
Statement	Expansion of core information security across government (Phase 2)
Rationale	The Government has suffered recent cybersecurity attacks including ransomware attacks. This has caused significant financial and reputational damage.
Implications & Recommendations	<p>The ICT Department has reworked its security fabric to include sandboxes, perimeter security and endpoint protection as part of Phase 1. Phase 1 included installation of web application firewalls, email log inspection software and virus/spam protection for the on-premise email server.</p> <p>The ICT Department will need to undertake a Phase 2 which will include sand boxing applications and endpoint management.</p> <p>There is current discussion on establishing end-user training</p> <p>Currently, there are no ICT cyber security policies in place.</p>
Mandatory/ Advisory	Mandatory
Review Reason	
Review Date	

Strategic Plan Element	
Reference	SP-005

Statement	Improvement of the core Government network infrastructure
Rationale	The 23 Government buildings across seven Ministries do not have wired internet connectivity, thereby impacting the ability to share data in real time and hampering service delivery. The Government has developed a separate microwave-based wireless network with the service provider Netstar to link these buildings but a wired network with high bandwidth would greatly improve quality of service for all Ministries.
Implications & Recommendations	<p>To improve the above, the Government is currently investigating bids from both telecom providers to build a fiber-based Government network. This network would greatly increase the bandwidth and speed between Ministries and facilitate better real-time data sharing between Ministries.</p> <p>By adding this network, the Government could use the existing 60 Mbps wireless network as a point of redundancy in case the fiber network fails. This will be a key element to address resiliency and ensure Government continuity while having the added benefit of providing a solid backbone for electronic service delivery.</p>
Mandatory/ Advisory	Mandatory
Review Reason	
Review Date	

EA Maturity Levels & Characteristics

Level 0 – No Enterprise Architecture

No Enterprise Architecture to speak of.

Level 1 - Initial - Informal Enterprise Architecture Process Underway

1. Processes are ad hoc and localized. Some Enterprise Architecture processes are defined. There is no unified architecture process across technologies or business processes. Success depends on individual efforts.
2. Enterprise Architecture processes, documentation, and standards are established by a variety of ad hoc means and are localized or informal.
3. Minimal, or implicit linkage to business strategies or business drivers.
4. Limited management team awareness or involvement in the architecture process.
5. Limited Operating Unit acceptance of the Enterprise Architecture process.
6. The latest version of the Operating Unit's Enterprise Architecture documentation is on the Web. Little communication exists about the Enterprise Architecture process and possible process improvements
7. IT Security considerations are ad hoc and localized.
8. No explicit governance of architectural standards.
9. Little or no involvement of strategic planning and acquisition personnel in enterprise architecture process. Little or no adherence to existing Standards Profile

Level 2 - Enterprise Architecture Process Is Under Development

1. Basic Enterprise Architecture Process program is documented based on OMB Circular A - 130 and Department of Commerce Enterprise Architecture Guidance. The architecture process has developed clear roles and responsibilities.
2. IT Vision, Principles, Business Linkages, Baseline, and Target Architecture are identified. Architecture standards exist, but not necessarily linked to Target Architecture. Technical Reference Model and Standards Profile framework established.
3. Explicit linkage to business strategies.

4. Management awareness of Architecture effort.
5. Responsibilities are assigned and work is underway.
6. The Department of Commerce and Operating Unit Enterprise Architecture Web Pages are updated periodically and is used to document architecture deliverables.
7. IT Security Architecture has defined clear roles and responsibilities.
8. Governance of a few architectural standards and some adherence to existing Standards Profile.
9. Little or no formal governance of IT Investment and Acquisition Strategy. Operating Unit demonstrates some adherence to existing Standards Profile.

Level 3 - Defined Enterprise Architecture Including Detailed Written Procedures and Technical Reference Model

1. The architecture is well defined and communicated to IT staff and business management with Operating Unit IT responsibilities. The process is largely followed.
2. Gap Analysis and Migration Plan are completed. Fully developed Technical Reference Model and Standards Profile. IT goals and methods are identified. The architecture aligns with the Department of Commerce and Federal Enterprise Architectures.
3. Enterprise Architecture is integrated with capital planning & investment control and supports e-government.
4. Senior-management team aware of and supportive of the enterprise-wide architecture process. Management actively supports architectural standards.
5. Most elements of Operating Unit show acceptance of or are actively participating in the Enterprise Architecture process.
6. Architecture documents updated regularly on Department of Commerce Enterprise Architecture Web Page.
7. IT Security Architecture Standards Profile is fully developed and is integrated with Enterprise Architecture.
8. Explicit documented governance of majority IT investments.
9. IT acquisition strategy exists and includes compliance measures to
10. IT Enterprise Architecture. Cost-benefits are considered in identifying projects.

Level 4 - Managed and Measured Enterprise Architecture Process

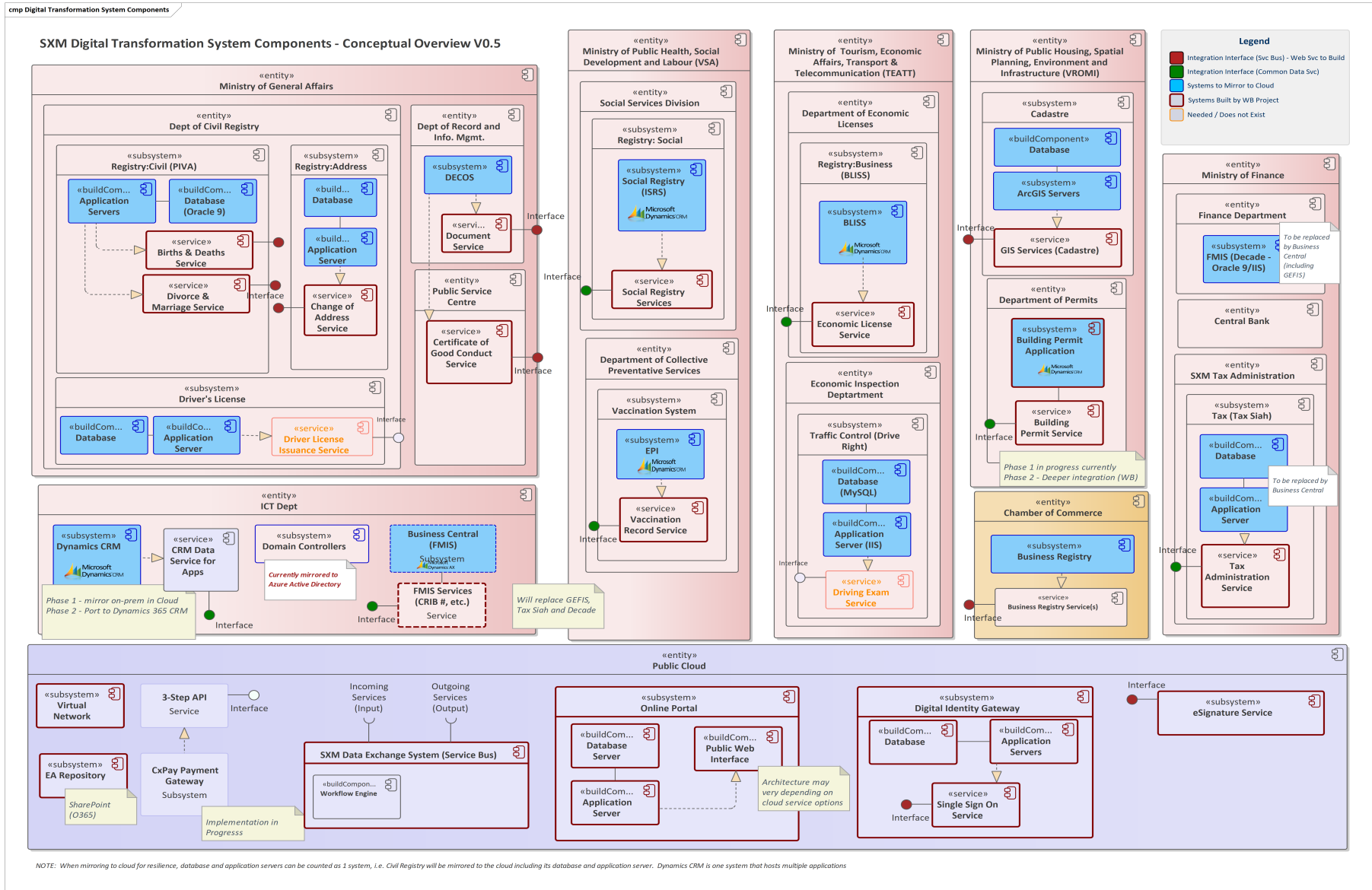
1. Enterprise Architecture process is part of the culture. Quality metrics associated with the architecture process are captured.
2. Enterprise Architecture documentation is updated on a regular cycle to reflect the updated Enterprise Architecture. Business, Information, Application and Technical Architectures defined by appropriate de-jure and de-facto standards. The architecture continues alignment with the Department of Commerce and Federal Enterprise Architectures. An automated tool is used to improve the usability of the architecture.
3. Capital planning and investment control are adjusted based on the feedback received and lessons learned from updated Enterprise Architecture. Periodic re-examination of business drivers.
4. Senior-management team directly involved in the architecture review process.
5. The entire Operating Unit accepts and actively participates in the Enterprise Architecture process.
6. Architecture documents are updated regularly, and frequently reviewed for latest architecture developments/standards.
7. Performance metrics associated with IT Security Architecture are captured.
8. Explicit governance of all IT investments. Formal processes for managing variances feed back into Enterprise Architecture.
9. All planned IT acquisitions and purchases are guided and governed by the Enterprise Architecture.

Level 5 - Optimizing - Continuous Improvement of Enterprise Architecture Process

1. Concerted efforts to optimize and continuously improve architecture process.
2. A standards and waivers process are used to improve architecture development process improvements.
3. Architecture process metrics are used to optimize and drive business linkages. Business involved in the continuous process improvements of Enterprise Architecture.

4. Senior management involvement in optimizing process improvements in Architecture development and governance.
5. Feedback on architecture process from all Operating Unit elements is used to drive architecture process improvements.
6. Architecture documents are used by every decision maker in the organization for every IT-related business decision.
7. Feedback from IT Security Architecture metrics are used to drive architecture process improvements.
8. Explicit governance of all IT investments. A standards and waivers process is used to improve governance-process improvements.
9. No unplanned IT investment or acquisition activity.

Annex 1: Digital Transformation System Components



Annex 2: Roles and Responsibilities Matrix

RACI Matrix		Point of Contact																				DTU		TEATT		VROMI		VSA		Justice		Finance		Telecom - UTS		Telecom - Telam		Bureau of Telecommunication	
Work Area	Task Description	Ferni Badojo	Emilia Honor Thomas	NRPB	Firm	Vendors	PMO	PM & 3 Ministers / Secretary / General	ICT Dept	Ministry	Civil Registry	Passport	PSC Philipaburg	PSC Simpson Bay	DTU	Secretary General	Economic License Division	Ministry	Secretary General	Permits Dept	Ministry	Secretary General	Social Insurance Fund	Ministry	Secretary General	Police Core	Ministry	Secretary General	Tax Dept	Central Bank	Ministry	CEO	Technical Team	CEO	Technical Team				
Component 1	Public Service Centre Modernization	C/I	C/I		R	R		I	C/I	C/I	A	C/I	C/I	C/I																									
	Public Service Centre Physical Upgrades	C/I	C/I		R	R		I	C/I	C/I	A	C/I	C/I	C/I																									
	Business Continuity Planning	R	C/I				A	I	C/I	C/I	C/I	C/I	C/I	C/I	R	C/I	C/I	C/I																					
	Digital Services - Certificate of Good Conduct	C/I	C/I		R	R		I	C/I	C/I	C/I	C/I	C/I	C/I												A													
	Digital Services - Change of Address	C/I	C/I		R	R		I	C/I	C/I	C/I	A	C/I	C/I	C/I											C/I	C/I												
	Digital Services - : Registration of a Death, Divorce or Marriage	C/I	C/I		R	R		I	C/I	C/I	C/I	A	C/I	C/I	C/I																								
	Digital Services - Building Permit Application	C/I	C/I	I	R	R		I	C/I	C/I		C/I	C/I	C/I																									
	Digital Services - Economic Licenses (*)	C/I	C/I	I	R	R		I	C/I	C/I				C/I	C/I	C/I	A	C/I																					
	Digital Services - Request for Vaccination Record	C/I	C/I	I	R	R		I	C/I	C/I				C/I	C/I	C/I										A													
Online Portal	C/I	C/I	I	R	R		I	C/I	C/I	A	C/I	C/I	C/I	C/I																									
Multi-Channel Service Delivery (Kiosk)	C/I	C/I	I	R	R		I	C/I	C/I	A	C/I	C/I	C/I	C/I																									
Component 2	Digital Identity	C/I	C/I	I	R	R		I	C/I	C/I	A	C/I	C/I	C/I	C/I	C/I																							
	Electronic Signatures	C/I	C/I	I	R	R		I	C/I	C/I	A	C/I	C/I	C/I	C/I	C/I																							
	Electronic Payment	C/I	C/I	I	R	R		I	C/I	C/I	C/I	C/I	C/I	C/I	C/I																								
	Interoperability Platform	C/I	C/I	I	R	R		I	C/I	C/I	C/I				A	C/I	C/I	C/I																					
	System Resilience	C/I	C/I	I	R	R		I	C/I	C/I	C/I				A	C/I	C/I	C/I																					
	Government Data Governance	C/I	C/I	I	R	R		C/I	C/I	C/I	C/I				A	C/I	C/I	C/I																					
Digitization of Records	C/I	C/I	I	R	R		I	C/I	C/I	C/I				A	C/I	C/I	C/I																						
Component 3	Legal - Enterprise Architecture	C/I	C/I	I	R	R		C/I	C/I	C/I					C/I	C/I	C/I	C/I								A	C/I	C/I											
	Legal - Interoperability	C/I	C/I	I	R	R		C/I	C/I	C/I					C/I	C/I	C/I	C/I								A	C/I	C/I											
	Legal - CyberSecurity	C/I	C/I	I	R	R		C/I	C/I	C/I					C/I	C/I	C/I	C/I								A	C/I	C/I											
	Legal - Data Privacy & Protection	C/I	C/I	I	R	R		C/I	C/I	C/I					C/I	C/I	C/I	C/I								A	C/I	C/I											
	Enterprise Architecture	C/I	C/I	I	R	R		I	I	C/I	C/I				A	C/I	C/I	C/I								C/I	C/I	C/I											
	Enterprise Architecture Repository	R								R	I				A	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		
	Dashboard	C/I	C/I	I	R	R		I	C/I	C/I	C/I	C/I	C/I	C/I	C/I	I	C/I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	Change Management - Capacity Building	C/I	C/I	R	R			I	C/I	C/I	C/I	C/I			C/I	C/I	C/I	C/I																					
	Change Management - Citizen Engagement	C/I	C/I	C/I	R			I	C/I					C/I	C/I	C/I	C/I	C/I																					
	Change Management - External Communications	C/I	C/I	C/I	R			I	C/I						C/I	C/I	C/I	C/I																					
Change Management - Internal Communications	C/I	C/I	C/I	R			I	C/I						C/I	C/I	C/I	C/I																						
Project Management	C/I	C/I	C/I	R			I	C/I	C/I					C/I	C/I	C/I	C/I																						
Governance	Monitoring and Evaluation	C/I	C/I	R				A	I	I					C/I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	Coordination	C/I	C/I	R				A	I	I					C/I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	Procurement	C/I	C/I	R				A	I	I					C/I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	Safeguards	C/I	C/I	R				A	I	I					C/I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	Financial Management	C/I	C/I	R				A	I	I					C/I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	Strategic Direction	C/I	C/I	C/I	C/I		A	R	C/I	C/I	I	I	I	I	C/I	C/I	I	I	C/I	I	I	I	I	I	I	C/I	I	I	I	I	I	I	I	I	I	I	I	I	

Notes:

- Ministries are expected to consult/inform internal departments where needed
- * Awaiting confirmation of specific economic licenses to be covered

© 2017 The World Bank
1818 H Street NW, Washington DC 20433
Telephone: 202-473-1000; Internet: www.worldbank.org

Some rights reserved

This work is a product of the staff of The World Bank. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of the Executive Directors of The World Bank or the governments they represent. The World Bank does not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Rights and Permissions

The material in this work is subject to copyright. Because The World Bank encourages dissemination of its knowledge, this work may be reproduced, in whole or in part, for noncommercial purposes as long as full attribution to this work is given.

Attribution—Please cite the work as follows: “World Bank. {YEAR OF PUBLICATION}. {TITLE}. © World Bank.”

All queries on rights and licenses, including subsidiary rights, should be addressed to World Bank Publications, The World Bank Group, 1818 H